



# Modelling Wellbeing

Assessing the role of macro-economic models to cater for wellbeing economies  
in Georgia, Kyrgyzstan and Tajikistan

# PREAMBLE

The report at hand is an outcome of the GIZ Sector Network *Sustainable Economic Development and Employment in South-East Europe, the Caucasus, Central Asia and Afghanistan (SENECA SEDE)* Challenge Fund project on exploring the use of (macro-) economic modelling activities to support a transition towards wellbeing economies. As case examples, three different types of models were analysed: Integrated Green Economy Model in Kyrgyzstan (based on system-dynamics and causal-loop diagrams), the Agriculture Sectoral Model in Tajikistan (based on partial equilibrium and welfare analyses) and the E3 modelling approach developed for Georgia and Kazakhstan (based on integrated economy, energy and emissions modules and scenario analysis). These modelling activities and the research at hand are supported by the following GIZ projects: *Green Economy and Sustainable Private Sector Development (GESPSD)* in Kyrgyzstan on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) and the Government of Switzerland through the Swiss Agency for Development and Cooperation (SDC), *Integrated Rural Development Project (IRDP)/Towards Rural Inclusive Growth and Economic Resilience (TRIGGER)* in Tajikistan and the *Sector Programme Sustainable Economic Development on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ)*, as well as *Policy Advice for Climate Resilient Economic Development (CRED)* in Georgia, Kazakhstan and Vietnam on behalf of the *German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV)*. This synthesis report was prepared by Dr. Andrea M. Bassi based upon country-specific inputs from Tatiana Vedeneva (Kyrgyzstan), Tengiz Lomitashvili (Georgia), Muqim Saidusainov (Tajikistan).

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# LIST OF ACRONYMS

BAU	Business As Usual
BMUV	German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection
CLD	Causal Loop Diagrams
COVID-19	Coronavirus Disease 2019
CRED	Climate Resilient Economic Development
EA	Ecosystem Accounting
EU	European Union
GDI	Gender Development Index
GDP	Gross domestic product
GE	Green Economy
GEM	Green Economy Model
GII	Gender Inequality Index
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
HDI	Human Development Index
IFs	International Futures
IGE	Inclusive Green Economy
I-O	Input-Output
KR	Kyrgyz Republic
LSF	Living Standards Framework
MoEC	Ministry of Economy and Commerce
MoESD	Ministry of Economy and Sustainable Development
MRV	Monitoring, Reporting, Verification
MtDP	Mid-term Development Programs
NDP	National Development Program
NDS	National Development Strategy
NGOs	Non-governmental organizations
OECD	Organisation for Economic Co-operation and Development
PEM	Partial Equilibrium Model
PQLI	Physical Quality of Life
SDGs	Sustainable Development Goals
SEEA	System of Environmental-Economic Accounts
TRIGGER	Towards Rural Inclusive Growth and Economic Resilience
UN	United Nations
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WWF	World Wildlife Fund for Nature

# 1. INTRODUCTION

Within development cooperation there is broad consensus that a fast and fair transition of global economic systems towards greener, more equitable and resilient economies is needed. A wellbeing economy can deliver on these objectives. It offers a vision for the economic system where the economy serves society and the environment – and not vice versa. Yet there is little consensus on what this vision means in practice or how development cooperation can provide concrete technical advice to partners in developing countries to move towards a wellbeing economy. If economic models are used in GIZ advisory services or in general by policy makers, it should be ensured that the models are able to capture all relevant elements of the wellbeing economy, use data appropriately and transparently and critically communicate assumptions and shortcomings. Otherwise the risk is high that economic modelling can contribute to ill-informed decisions, resulting in side effects and policy resistance.

In a very simplified way, models describe the societies and economies we live in. They help understand the past and present and forecast the future. Different models look at different policy areas, such as trade, fiscal policy, climate adaptation, food production etc. Macroeconomic models assess the impact of different policies on the economy; models at the micro level consider interactions at the level of households or companies. They all have numerous weaknesses and strengths. Nevertheless, they play an important role in policy assessment, planning and decision-making, such as in informing decision making for a green recovery in the aftermath of the COVID-19 pandemic. Economic models are based on economic theories; they are informed by empirically derived behavioural rules for investors, consumers, producers etc., and supported by data analytics drawn from various sources, including the national statistics and institutional data. Some of these models are narrowly focused, while others are more systemic. In the case of the latter, economic models can be an appropriate tool to internalize external (environmental) costs which are often neglected in classic GDP calculations.

Whether economic growth improves the wellbeing is a matter of conditions, and in the case of economic models, boundaries. Policy reforms aimed at “greening” the economy – including but not limited to promoting “green” investments, mobilizing international climate finance – can increase the wellbeing due to improved conditions for the targeted groups of population, such as elderly people or children. Similarly, identifying interventions to enhance climate resilience and adaptation, contributes to making economic growth compatible with increasing wellbeing over time. As a result, comprehensive model boundaries are required, spanning across sectors (e.g. economy, energy, land use), economic actors (public sector, private sector, households), dimensions of development (society, economic, environment and governance) and tracking progress over time (for the short, medium and longer term). Taking it a step further in a more holistic way, worldwide systemic wellbeing approaches and models are increasingly being considered and implemented, such as the New Zealand’s Living Standards Framework, World Bank’s Wealth of Nations, the Capitals Coalition, Economy for the Common Good.

With this background, this report aims at (i) providing insights about various modelling tools and promote their use, including climate economic models, in the GIZ partner countries; (ii) advance the debate on wellbeing economies and outline how economic models can inform a wellbeing economy by integrating various, multi-dimensional indicators; (iii) share experiences among the GIZ projects engaged in economic policy advice and governance, specifically in Georgia, Kyrgyzstan and Tajikistan.

## 2. DEFINING AND MEASURING THE WELLBEING ECONOMY

### Key messages

- The definition of wellbeing economy is very similar to the one of Green Economy (or, more specifically, to an Inclusive Green Economy -IGE-), aiming at achieving Sustainable Development, as measured by the Sustainable Development Goals (SDGs).
- An important difference is the perception of root causes of current unsustainable development and respective alternative solutions.
- A wellbeing economy is characterized by putting people at the center, and argues that economic development has to be realized for the good of people (we need people, equity and equality for economic growth not the other way around, economic growth first and then solving social and environmental problems).
- Economic growth, in isolation, and especially if it does not contribute to societal wellbeing (i.e. quality of growth) is not needed (it is, in fact, detrimental). By extension, social, human and environmental capital is essential in the wellbeing economy, and should be seen as assets. The implication is that all externalities, resulting in social and environmental impacts, are explicitly considered in development (and hence economic) planning.
- We cannot measure the wellbeing economy with a single indicator, we need many. Further, information can be both qualitative and quantitative, the measurement goes beyond observed data (e.g. in the case of institutions and governance).
- Emphasis has to be put both on stocks (capitals) and flows. The latter (as in the case of GDP, measuring only what we can generate in a given year, without considering what we consume -and deplete irreversibly- to generate it) is not sufficient.
- It is important to measure progress towards a wellbeing economy, not only the current state, to inform policy development on an ongoing basis.

## 2.1 Definitions

The definition of wellbeing economy<sup>1</sup> is very similar to the one of Green Economy (or, more specifically, to an Inclusive Green Economy –IGE–)<sup>2</sup>. It aims at achieving very similar goals (Sustainable Development, as measured by the SDGs) – however with a different perspective on root causes and solutions for unsustainable developments. Specifically, the IGE considers economic growth as being necessary, with the economic dimension being featured first in the IGE definition. On the other hand, to provide an example, the OECD defines the “economy of wellbeing” as *‘the capacity to create a virtuous circle in which citizens’ wellbeing drives economic prosperity, stability and resilience, and vice-versa, that those good macroeconomic outcomes allow to sustain wellbeing investments over time’* (OECD, 2019). Specifically, this definition underlines the importance of putting people at the center of development planning, rather than the economy. Further, it highlights that a virtuous cycle between wellbeing and economy can be created, but it does not imply that growth can continue forever, otherwise we would reach beyond planetary boundaries. Instead, it points to the need to increase the quality and usefulness of growth. As a result, an effective redistribution of growth, resulting in absolute de-growth may still generate an increase in wellbeing at the national and global level.

Advocates of the wellbeing economy concept argue that economic development has to be realized for the good of people. In other words, we need people, equity and equality for economic growth, in a mutually reinforcing relationship (Figure 1). The long-pursued strategy based on neo-classical economic to prioritize growth, so that social and environmental problems can be solved with the resources accumulated via economic growth has proven to be ineffective. In this context, capitals – intended as nature, social, human, and produced capital – form the base of human wellbeing and economic growth (Capitals Coalition, s.d.). Capital is therefore seen as a resource or asset that provides value to people. In other words, economic growth, in isolation, and especially if it does not contribute to societal wellbeing is not needed (it is, in fact, detrimental). Therefore, a “wellbeing economy” does not start from the idea that economy determines public interests, but rather the other way around (WWF, 2020).

The implication is that all externalities, resulting in social and environmental impacts, are explicitly considered in development (and hence economic) planning. As a result, the wellbeing of people is central, and the results of social, economic, environmental and governance performance, as shown in Figure 1 (WWF, 2020). It results that, when considering the available definitions of the wellbeing economy, several indicators are needed to measure socio-economic, environmental and governance performance in a wellbeing economy, as presented in the next section.

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1 In this paper “wellbeing economy” and “economy of wellbeing” are defined in the same way. While we acknowledge that these concepts present differences, in the context of simulation models the focus is on indicators, methods to solve equations and interpretation of results. As a result, no distinction is made in models in relation to how “wellbeing economy” or “economy of wellbeing” are defined, if the same indicators can be used to measure them.

2 As UNEP states “An Inclusive Green Economy (IGE) has evolved from earlier work on Green Economy. In its simplest expression, such an economy is low carbon, efficient and clean in production, but also inclusive in consumption and outcomes, based on sharing, circularity, collaboration, solidarity, resilience, opportunity, and interdependence.” Source: <https://www.unep.org/explore-topics/green-economy/why-does-green-economy-matter/what-inclusive-green-economy>



Figure 1: The wellbeing economy according to WWF, with emphasis on human wellbeing over wealth (WWF, 2020).

In a way, the wellbeing economy is simply economics, since economists have always been concerned with human wellbeing – or welfare, but in an overly simplified manner (Dalziel & Saunders, 2014). Wellbeing economics considers mainly three elements: human capabilities, planetary boundaries and future generations. The first one does not focus on merely economic production, but on how the economic system enables progress. The second one originates from the concern that economic growth threatens the wellbeing of people, also due to environmental degradation. The last element considers that each generation should take care of socio-economic and environmental sustainability while increasing physical and human capital, embracing technological progress when it generates societal benefits. These three elements allow a wellbeing economy to provide people with equal opportunities, a sense of social inclusion and stability, guaranteeing harmony with the natural world (Chrysopoulou, 2020).

## 2.2 Methods and indicators

Since the wellbeing economy is multi-dimensional, and puts socio-economic and environmental sustainability at the center of economic planning, we cannot measure it with a single indicator. A narrow focus on GDP is not sufficient to achieve sustainable growth nor to measure wellbeing (World Bank, 2021).

The World Bank offers an approach to measure comprehensive wealth in *The Changing Wealth of Nations 2021: Managing Assets for the Future* (World Bank, 2021). Qualitative and quantitative information is used in this assessment, with the measurement of wealth reaching beyond observed data (e.g. in the case of institutions and governance). Emphasis is put both on stocks (capitals) and flows. The latter (as in the case of GDP, measuring only what we can generate in a given year, without considering what we consume –and deplete irreversibly– to generate it) is not sufficient.

Assessing progress towards wellbeing requires looking not only at the economic system, also at the diverse experiences and living conditions of the population (OECD, s.d.). Further, progress should be measured on an ongoing basis and over time (i.e. measuring the state of the wellbeing economy in a given year, as well as the annual progress realized year after year), to effectively inform policy development. In this context, the *OECD Framework for Measuring Well-Being and Progress* is built around three components: current wellbeing, inequalities in wellbeing outcomes, and resources for future wellbeing, as shown in Figure 2.

A customized example of the measurement of the wellbeing economy is found in New Zealand. The Living Standards Framework (LSF) allows to measure relevant indicators for the citizens of New Zealand, now and into the future (The Treasury, 2021). LSF includes three main components: (i) individual and collective wellbeing, (ii) institutions and governance, and (iii) the wealth of Aotearoa New Zealand (measuring wealth in relation to human capabilities and the natural environment).

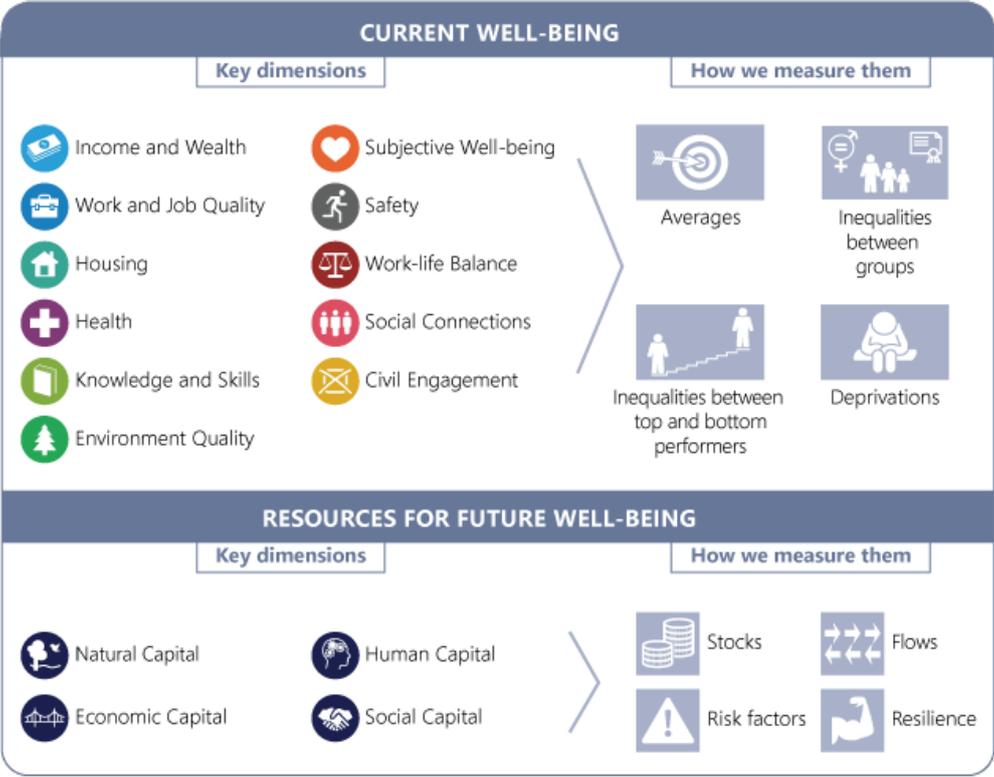


Figure 2: OECD wellbeing framework (OECD, s.d.).

## 2.3 Working definition of wellbeing economy and its uptake in country policies

In light of the literature, and taking into account the development goals of Georgia, Kyrgyzstan and Tajikistan, we define the wellbeing economy here as follows:

A wellbeing economy is one that is characterized by a mutually reinforcing relationship between society, economy and the environment. By placing people at the center of development, it provides equal rights and opportunities for all individuals, stability and resilience, and access to natural capital for the current and future generations. Individuals within a wellbeing economy have and fully accept the responsibility to create and support governance structures that ensure peaceful co-existence, harmonious relationship between society and nature, and healthy and resilient communities.

While this definition has emerged from the review of literature, available data and by considering the experience and development priorities of Georgia, Kyrgyzstan and Tajikistan, it is possible that the main underlying principles are also applicable to other countries. As a result, this definition could be used as a starting point for further customization at the country level.

The closest concept to wellbeing economy in Georgia, Kyrgyzstan and Tajikistan is the one of sustainable development, in most instances operationalized at the national and sectoral level with the use of a green economy approach (i.e. a systemic and action-oriented approach).

### Georgia

Three international policy frameworks define Georgia's approach to sustainable development. First, the Association Agreement with the EU, which primarily focuses on green growth, sustainable and wellbeing economy; second, the UN 2030 Sustainable Development Agenda, with the 17 SDGs and efforts to mainstream them in national policy documents; third, the Green Growth Declaration of OECD, which Georgia joined in 2016, aimed at the creation of a national Green Economy Strategy. Awareness of the concept of wellbeing economy among national stakeholders is low, and practical applications are generally lacking. Many national policies are also available, that promote sustainable development across sector. A relevant and recent example is the newly approved "Development Strategy of Georgia – Vision 2030", which consider explicitly most of the SDGs and it is fully aligned with the UN 2030 Sustainable Development Agenda.

### Kyrgyz Republic

The Kyrgyz Republic has also committed to achievement of the SDGs, and has formulated four main political documents that contain references to the wellbeing of its citizens: (i) National Development Strategy (NDS) of the Kyrgyz Republic 2018–2040; (ii) The National Development Program of the Kyrgyz Republic until 2026 (NDP 2026); (iii) Concept of green economy in the Kyrgyz Republic "Kyrgyzstan is a country of green economy", approved in 2018, and (iv) Green Economy Programs in the Kyrgyz Republic for 2019–2023, accompanied by the Action Plan of the

Green Economy Development Program in the Kyrgyz Republic for 2019–2023. Importantly, the NDS states that “the quality and standard of living, the rights and obligations of an individual are at the centre of state policy. The strategy is primarily aimed at creating an environment for human development, unlocking the potential of everyone who lives in our country, and ensuring their wellbeing<sup>3</sup>.” Further, chapter II of the NDS, titled “Human – family – society”, elaborates the vision and includes aspects of social development (health system, education system, youth potential, equal opportunities, respectable work and old age), family as the base of societal development, civil integration (National unity, language policy), culture, and religion in a democratic state. Chapters III to VII are devoted to Economic wellbeing and the quality of the environment for development, State governance, Priority development areas, and Priority steps in the mid-term phase and Development management. This shows knowledge of the wellbeing economy concept and awareness of its advantages for sustainable development.

## Republic of Tajikistan

The Republic of Tajikistan, after having adopted the SDGs, has developed the National Development Strategy 2030 (NDS-2030) and the Mid-term Development Programs 2015–2020 and then 2021–2025 (MtDP-2025) to chart the road ahead towards achieving multi-dimensional sustainable development targets. The NDS-2030 sets the highest goal for the country’s long-term development to increase the population’s standard of living and wellbeing based on the implementation of the “4 + 1 Concept”. This concept involves the achievement of four national strategic development goals, and ensuring decent living conditions for every citizen is one of these goals. In 2022, the Government of Tajikistan drafted the Green Economy Strategy 2022–2037 and the corresponding Action plan 2022–2026. The Strategy foresees sustainable green development of Tajikistan across many sectors, such as industry, agriculture, energy, tourism, education and others. Several additional efforts are found in the health and education sectors to strengthen social services and contribute to development in a systemic way.

## Cross-country analysis

A review of existing policy documents, complemented by interviews with local stakeholders in each country, highlights that the main elements of the wellbeing economy currently being considered are human capital development and social welfare, democratic development (Georgia), balance across social, economic and environmental performance (Kyrgyzstan), and 8 principles that interlink development with governance (Tajikistan). Overall, all three countries follow a green economy approach that outlines the need to realize economic growth, while simultaneously empowering people and reducing inequality, and – at the very least – minimizing environmental impact, or even improving ecosystem integrity. To provide a few examples, in Georgia human capital is considered to be a key factor for achieving sustainable development and improving welfare of the whole society. Additionally, actions have been taken to establish and promote the “green growth” concept in Georgia (e.g. with the creation of a Green Growth policy paper) and the development of a “green growth” strategy is being initiated by the Ministry of Economy and Sustainable Development (MoESD). Kyrgyzstan has developed several policy documents directly aimed at the development of the green economy<sup>4</sup> and implementation is following suit. Tajikistan finalizes the Green Economy Strategy 2022–2037 and the Action Plan for implementing this strategies for 2022–2026. Also, Tajikistan has endorsed the following principles, which are well-aligned with the concept and goals of the wellbeing economy: justice (equal access to

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3 <http://www.stat.kg/ru/nsur/> page 5, paragraph 6.

4 Examples include “Kyrgyzstan is a country of green economy” approved in 2018, and Green Economy Programs in the Kyrgyz Republic for 2019–2023, accompanied by Action plan of the Green Economy Development Program in the Kyrgyz Republic for 2019–2023.

nature), respect (in the name of prosperity and wellbeing), frugality (calculation of territorial loads on the planet), participation (broad participation in decision-making), good governance (accountability), sustainability (achieving economic, social and environmental sustainability), efficiency (sustainable production and consumption), connection between generations (investment in the future).

## 2.4 Indicators of relevance to measure the wellbeing economy at country level

Having discussed the definition of wellbeing economy, this section focuses on the indicators of relevance at the country level. It builds from the literature review on measurement frameworks (section 2.2), considers the definition described above, development goals and available national statistics.

Many indicators are required to measure wellbeing. Further, with wellbeing being a subjective concept, differences in measurement frameworks may well emerge at the country, as well as sub-national level. The literature shows that, at the very least, three main dimensions should be considered:

- individual and collective wellbeing,
- quality of institutions and governance,
- and national wealth and resources (all social, human, economic and natural capital) available for future wellbeing.

As indicated earlier, the concept of wellbeing economy is not well integrated in policymaking in Georgia, Kyrgyzstan and Tajikistan. Still, elements of it are found in several national planning documents. As a result, selected indicators are also tracked and measured, even if not grouped as “wellbeing indicators”, for the areas that are included in national strategies as the following examples demonstrate.

### Georgia

Georgia uses several indicators to track progress towards sustainable development, that are also pertinent and relevant to the wellbeing economy. Focus is primarily on poverty eradication, human health, and education. These elements of sustainable development are frequently considered in national and sectoral policy documents, receive public budget on an annual basis, and are also highlighted in private sector sustainability strategies. The research shows that many stakeholders are interested in, and impacted by, discussions related to the wellbeing economy. The following chart is an Influence – Interest Matrix. The horizontal axis of the chart shows the *relative interest* of wellbeing economy stakeholders. The vertical axis shows the *relative influence* of wellbeing economy stakeholders, or the ability to influence the policy process. Combining *relative interest* and *relative influence* gives the Influence – Interest Matrix, as shown in Figure 1.

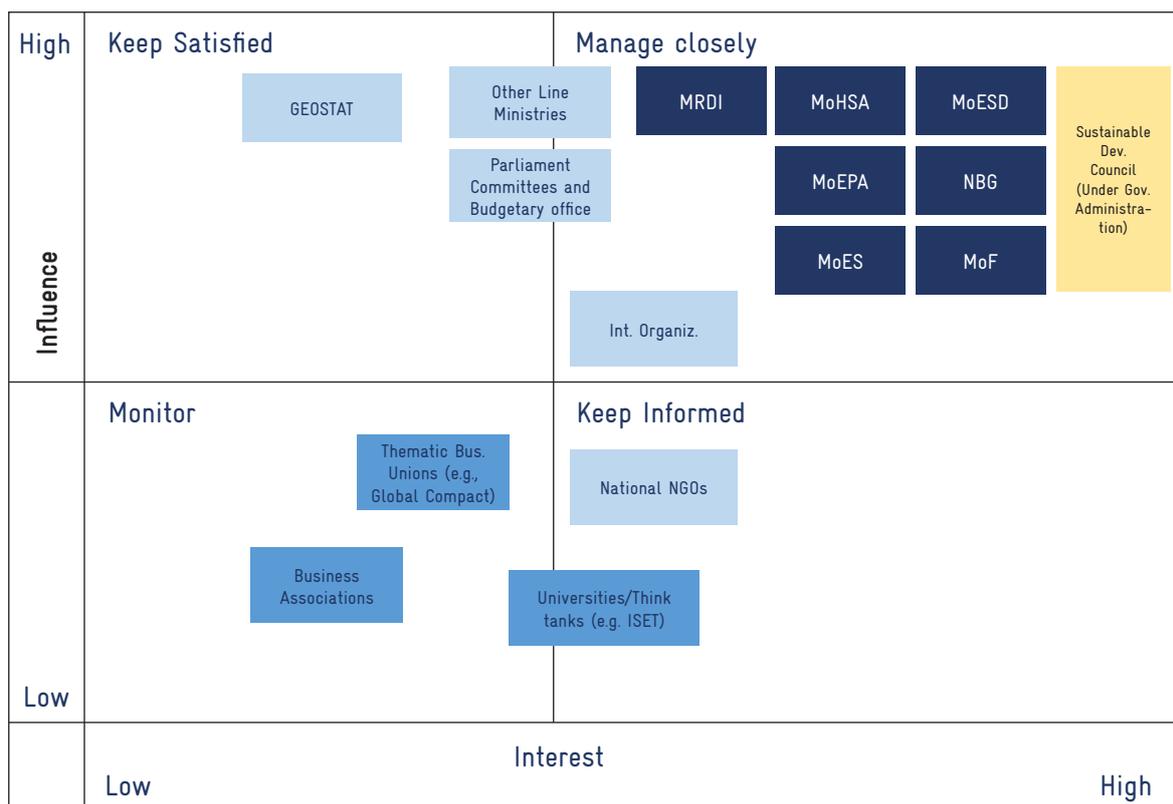


Figure 3: Influence – Interest Matrix for the wellbeing economy in Georgia.

## Kyrgyz Republic

In Kyrgyzstan, the National Development Program of the Kyrgyz Republic until 2026 (NDP 2026), aimed at improving the wellbeing of citizens, considers a variety of targets and quantifiable indicators. While these are primarily economic, the list includes the fundamental commitment to “leave no one behind” of SDGs and indicators related to human development, poverty reduction, government efficiency and the Corruption Perceptions Index. At the same time, the National Statistical Committee of the Kyrgyz Republic has finalized the SDG Targets and Indicators. More than 40 meetings of working groups were held where all 17 goals, 169 tasks and 239 indicators were reviewed and discussed in detail<sup>5</sup>.

## Republic of Tajikistan

Similarly, Tajikistan uses several economic and social indicators to measure progress towards sustainable development. In addition to these, it also considers poverty rates, human capital and HDI, Gender Inequality Index (GII), Gender Development Index (GDI), losses in the Human Development Index because of the inequality, the quality of public administration, government effectiveness and quality of legislation, corruption and transparency of the state budget, environmental sustainability.

<sup>5</sup> <http://stat.kg/ru/news/nacstatkom-razmestil-finalnyuyu-matricu-pokazatelej-dostizheniya-cur/>

## Preliminary conclusions

Overall, we find that more emphasis is put on the indicators that traditionally have been relevant for national development planning (e.g. economic indicators, social indicators related to the provisioning of social services). On the other hand, efforts are being made to expand the list of indicators, adding new dimensions that are relevant to the monitoring of the SDGs (e.g. on governance). Further, indicators tend to focus on flows rather than stocks, with the only exception being education where traditionally both stocks and flows have been monitored.

# 3. WELLBEING AND ECONOMIC MODELLING IN GEORGIA, KYRGYZSTAN AND TAJIKISTAN

## Key messages

- Many methodologies and models are available to support development planning. An economy-energy-emissions (e3.ge) model is used in Georgia; Kyrgyzstan has adopted the multi-sectoral Green Economy Model (GEM); Tajikistan uses several sectoral models, with emphasis on macroeconomic performance and on key economic sectors (e.g. agriculture).
- Each of the models reviewed at the country level includes elements of wellbeing, but not all necessary indicators. Many areas for improvement exist, including (i) expanding the boundaries of the model by adding new indicators, (ii) explicitly considering stocks and flows. Model coupling could also be considered. In addition, efforts to improve data collection and data quality should be considered.
- Inter-disciplinary cooperation and active participation of civil society stakeholders and state bodies is necessary to create new models for wellbeing or further develop existing models. The process of modelling can, if applied appropriately, be seen as a moderation tool for negotiations and participatory discussions of trade-offs and interdependencies in policy making.

## 3.1 The wellbeing economy in economic models, country experience

Every country uses several simulation models to inform policymaking. Some may be sectoral, while other are integrated; some may analyze top-down policy implementation, while others consider bottom-up technology adoption. In this section we review models that are used in Georgia, Kyrgyzstan and Tajikistan to inform policy for sustainable development. We therefore consider a subset of the models employed at the country level, and assess the extent to which these models are aligned with the wellbeing economy concept.

### Georgia

Macroeconomic modeling capacity in Georgia is mainly concentrated in public institutions, primarily ministries in charge of economic development. In general, wellbeing is not an explicit component of element of any economic modeling being carried out in the country, being a new concept. This reflects a known issue: a mismatch exists between the sustainable development ambition and the modeling capabilities available in Georgia. However, the e3.ge model was recently added to the toolbox available in the country (GIZ, 2022). It was developed by the GIZ-implemented "Policy Advice for Climate Resilient Economic Development" (CRED) project

on behalf of the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV), and delivered to the Ministry of Economy and Sustainable Development (MoESD), Department of Economic Analysis and Reforms. The purpose of this model is to incorporate climate change impacts in economic modeling, estimating the economic impact of climate change across sectors. The e3.ge model is based on an input-output (I-O) matrix. Behavioural parameters on the macro level are econometrically estimated. In combination with scenario analysis, e3.ge is suitable to investigate the economic impacts (e.g., changes in economic indicators such as GDP and employment) of climate hazard trends, as well as of climate change adaptation scenarios. The e3.ge model contains three interlinked components: (1) the economy module, (2) the energy module and (3) the emissions module. The central part of the economic model are the input-output tables (sectoral data) and national accounts (macroeconomic data) depicting key and supporting industries, their interlinkages as well as the domestic and foreign drivers for economic growth. The labor market is part of the model to monitor the impacts on jobs. The foreign trade section contains the country's imports and exports at a sectoral level. Unit costs and prices are calculated within the model. Energy balances, which include energy supply, transformation and demand for various energy carriers, are at the center of the energy module. Energy demand is determined by economic activity. The emissions module comprises the energy-related CO<sub>2</sub> emissions. Climate hazard effects (e.g. damage caused by heavy precipitation, effects of heat on labor productivity) and investments in adaptation measures (e.g. irrigations systems, windbreaks) are added as scenario drivers and can reduce the impact of climate change on economic activity. As a result, this model covers certain dimensions of the wellbeing economy, primarily the social and economic ones (SDG 8, 9, 12), but also energy (SDG 7) and climate action (SDG 13), but does not consider many of the environmental and governance indicators, while also not capturing explicitly stocks (I-O tables are typically representing flows, but can include capital stocks, with investment and depreciation if data are available). Depending on data availability, e3.ge could be enlarged to include more relevant indicators (see Lutz et al. 2017 for respective extensions for Germany (Lutz, Zieschank, & Drosdowski, 2017)). Future planned improvements include the integration of the social accountability matrix in the e3.ge model, which will allow to assess SDGs 1-5 and 10, if related indicators are separated in the SAM (GIZ, 2022).

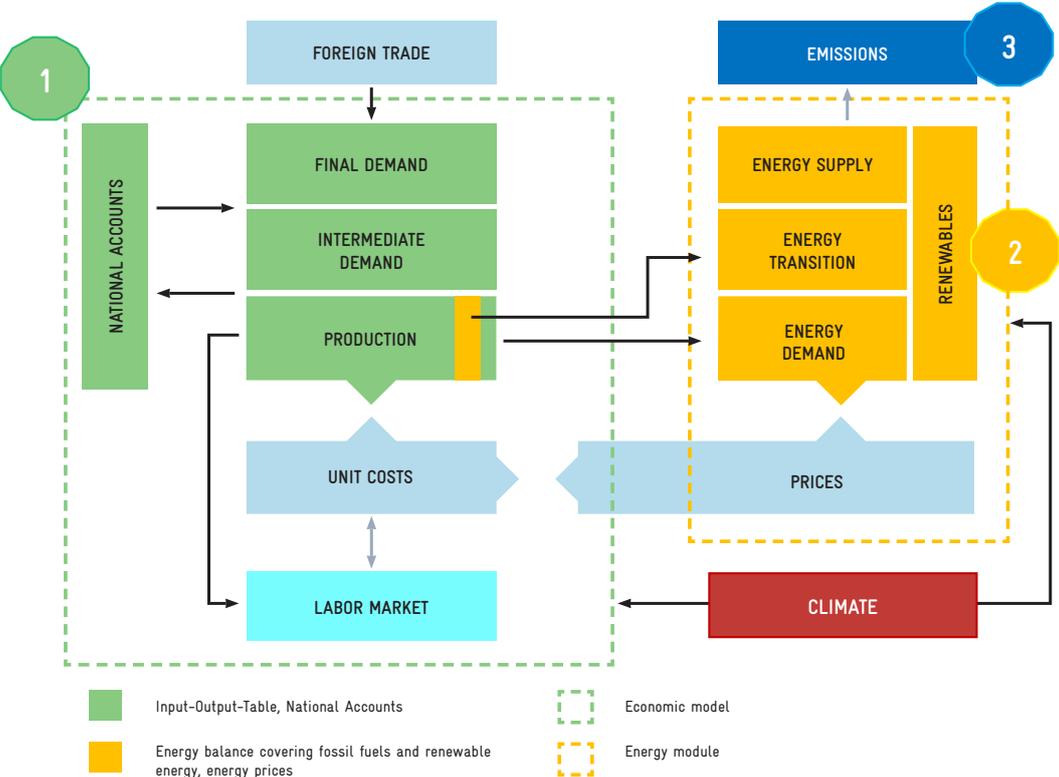


Figure 4: Graphical representation of the main components of the e3.ge model (GIZ, 2022).

## Kyrgyz Republic

Two main models have been identified as being relevant in Kyrgyzstan, and cover a broad range of the indicators required to assess the wellbeing economy. First, the International Futures (IFs) platform was used by the MAPS<sup>6</sup> mission as a method to assess the development outcomes of various scenarios. IFs is a large-scale, long-term, integrated global modelling system<sup>7</sup> consisting of multiple interlinked sub modules, each representing different dimensions of development. The model is built using a hybrid approach, primarily to allow for the inclusion of stocks and flows, and has to guarantee accounting structures in relation to aging populations (cohort component structure), financial flows among agent classes (social accounting), energy resources and production/demand, land use, and carbon stocks and flows. The model runs recursively with single-year time steps and forecast horizons to 2100. It is therefore useful for vision and strategy formulation but may not be optimal for short to medium term policy analysis.

The model is built on a structure comprising 12 modules, and over half of these modules can be of interest when looking at wellbeing economy. Specifically, IFs was used to model three SDGs acceleration scenarios: Human Development, Governance and Economy, all related to the wellbeing economy concept. Second, the Kyrgyz economy, society and environment were modelled using the system dynamics methodology for analyzing policy interventions, developed as part of the Programme of Green Economy Development of the Kyrgyz Republic. The model is called Green Economy Model (GEM) (Bassi, 2015) and can be successfully built upon to analyze the welfare economy. GEM for Kyrgyzstan was developed using a co-creation and multi-stakeholder approach, emphasizing inter-agency coordination, with emphasis on Green Energy, Green Agriculture, Green Industry, Low Carbon and Environment Friendly Transport, Sustainable Tourism, Waste Management and Natural Ecosystems and the interconnections existing among these sectors and thematic areas. The modelling process started with the creation of Causal Loop Diagrams (or system maps), to generate a shared understanding of the key drivers of change at sectoral level, and then continued with the creation of a customized mathematical model.

The diagrams and model were developed in collaboration with Ministry of Economy and Commerce (MoEC) of the KR and the expert Working Group, created by the Ministry and consisting of experts from different state bodies, NGO and academia. Group model building exercises were used for creating the model and it was therefore co-created and uniquely customized to Kyrgyzstan. One of the advantages of the GEM for Kyrgyzstan is that it allows carrying out a cross-sectoral and multidimensional evaluation of scenarios. It requires deep understanding not only of a sector, but of its interconnections with others, such as, in the case of tourism for example, connections to buildings, energy, water, waste, environment, as well as employment and GDP. This systemic approach to modelling facilitates use of a systemic approach to policymaking. The model can be used to support a variety of policy assessments both at the national and sectoral level. Additional international streams of work related to the similar models include monitoring performance against the SDGs, communications to the UNFCCC and the development of Environmental and Economic Accounts under the System of Environmental-Economic Accounts (SEEA) Central Framework and SEEA Ecosystem Accounting (EA). Thus, GEM is well suited for modelling and monitoring wellbeing economy, as it already has many of the needed indicators included.

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<sup>6</sup> Mainstreaming, Acceleration and Policy Support (MAPS). MAPS was an UN system-wide undertaking, which aimed to mobilize and leverage expertise and comparative advantage of the UN system to contribute to human-centered and rights-based sustainable development. A report on Kyrgyzstan's progress on SDGs was produced in 2019 and can be accessed at [https://kyrgyzstan.un.org/sites/default/files/2019-09/MAPS%20Report\\_ENG\\_Final\\_15May2019.pdf](https://kyrgyzstan.un.org/sites/default/files/2019-09/MAPS%20Report_ENG_Final_15May2019.pdf)

<sup>7</sup> A report on Kyrgyzstan's progress on SDGs. A Review of Mainstreaming, Acceleration and Policy Support for Achieving Progress on Sustainable Development Goals, 2019.

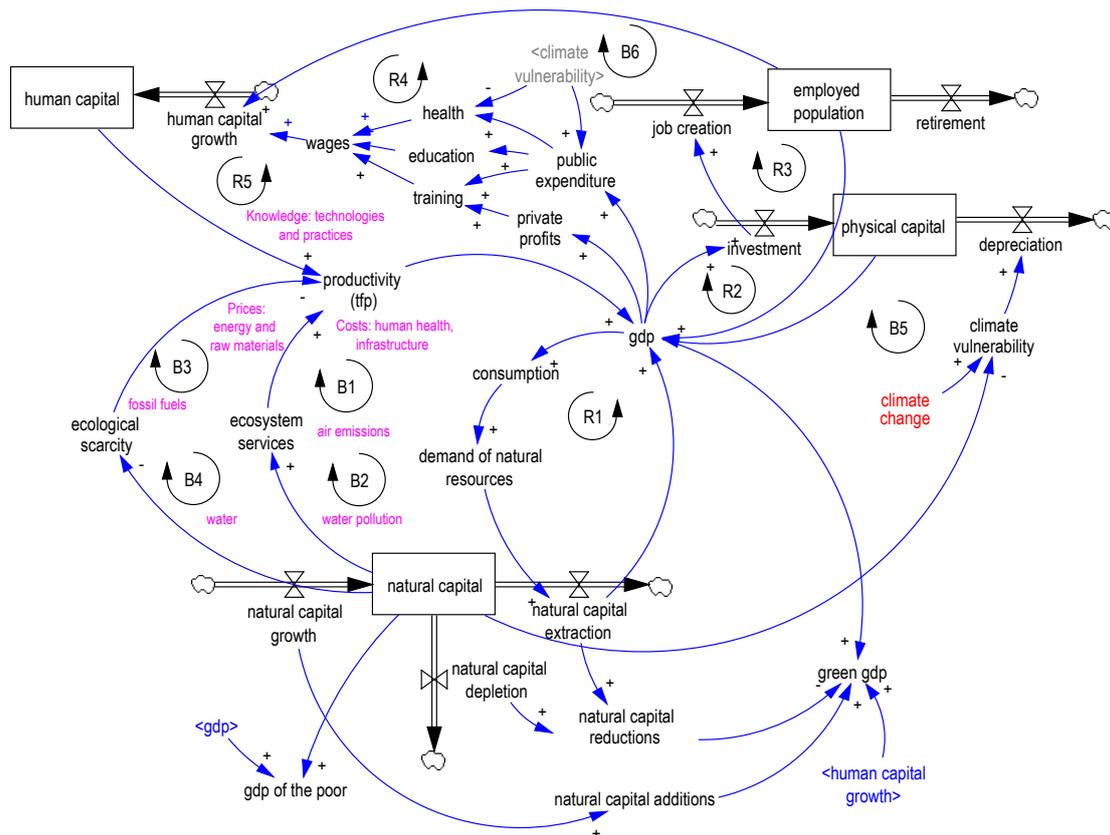


Figure 5: Graphical representation of the main components of the GEM model (Bassi, 2015).

## Republic of Tajikistan

Several models are used in Tajikistan, and research shows that none of these is comprehensive enough to effectively support the assessment of the wellbeing economy. For instance, a macroeconomic model (multi-sectoral) is used to forecast for the main indicators of relevance for economic analysis (e.g. GDP, government revenues and expenditure). On the other hand, a labor market, or employment module is missing in this macroeconomic model, and sectoral models on employment are not available. Further, this model does not include a financial component. The role of the National Bank, Ministry of Finance is not explicitly represented, limiting the use of the model for policy analysis. For instance, GDP is estimate only using a supply-side approach, considering production of goods, services, and taxes. On the other hand, very capable and more comprehensive models are found in other sectors, such as agriculture. Being one of the most important sectors for the country (close to 20% of GDP), and for employment (close to 60% of the labor force works in the agriculture sector), data and models can be found in this area. As an example, GIZ via the "Towards Rural Inclusive Growth and Economic Resilience (TRIGGER)" program has supported the creation of a partial equilibrium model (PEM) for the agriculture sector. This model allows for example evaluations of impacts of policy changes and/or implications of other exogenous developments. Examples include the evaluation of value chain development interventions, fiscal policies (e.g. subsidies, tariffs) or changing quotas, as well as the impact of scenarios of inaction under various external assumptions (e.g. climate change, a potential financial crisis, foreign policy changes, etc.). The model can be applied not only to the agricultural sector but to any other sector for which data is available. The tool has some elements of wellbeing analyses and allows the calculation of consumer and producer surpluses, changes in foreign trade, budget, and total wellbeing in the respective sector.

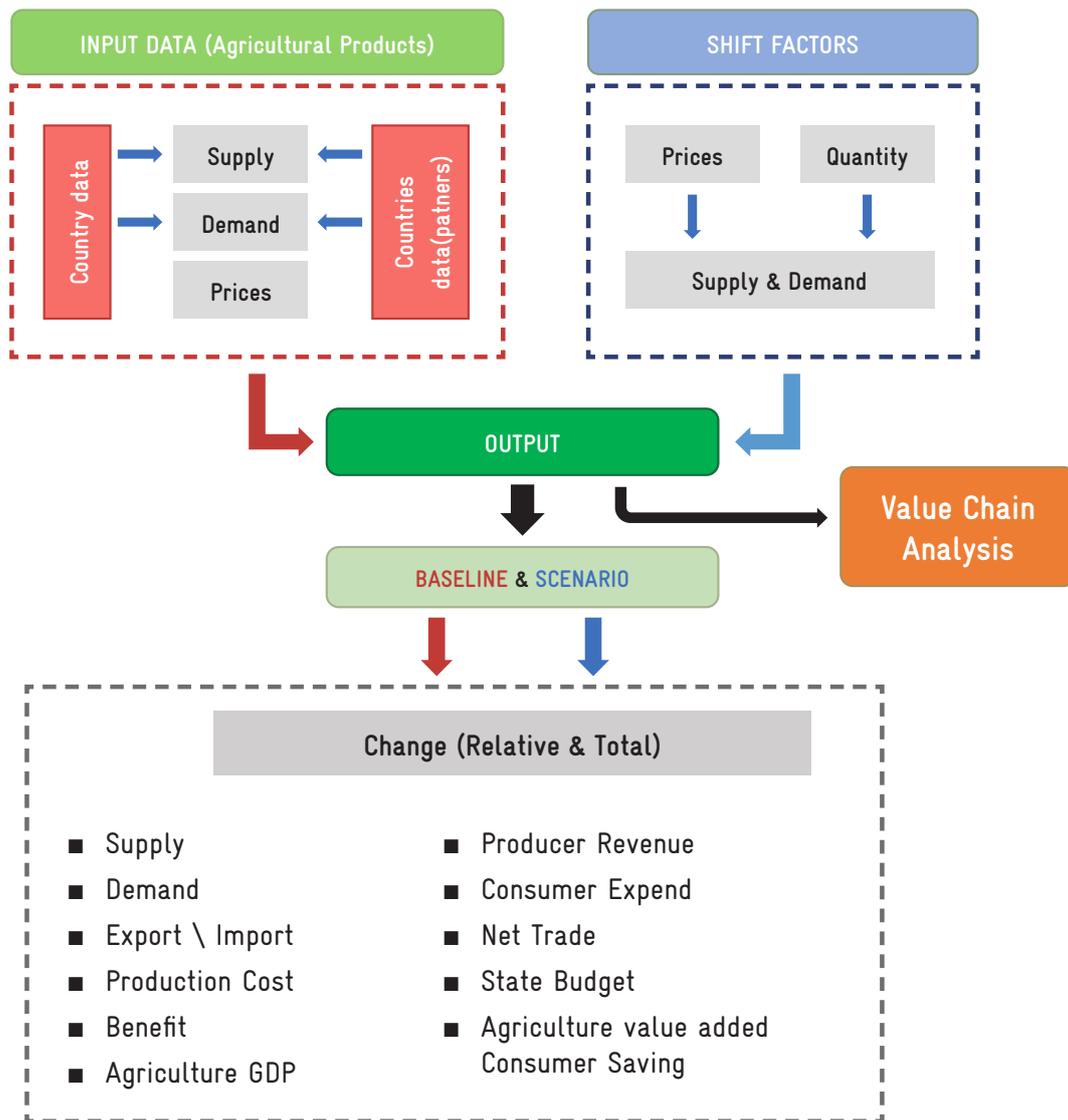


Figure 6: Graphical representation of the main components of the agriculture model.

### Cross-country/preliminary conclusions

Each of the models reviewed at the country level includes elements of wellbeing, but not all necessary indicators. On the other hand, given that the concept of wellbeing is multi-dimensional as well as inherently subjective, it is important for models to include as many indicators as possible, in alignment with the agreed definition of wellbeing, so that a selection of the most relevant ones (from a subjective perspective) can be utilized and analyzed.

In this vein, if models are to be used to inform decision making, it should be stressed that, given the subjective nature of wellbeing, it is not possible to optimize a model for a universal wellbeing outcome. A participatory and multi-stakeholder process can, and should be implemented to formulate the definition and identify relevant indicators. In addition, together with the use of several indicators for measuring wellbeing (instead of using an aggregate index), "what if" simulations should be preferred. This allows to avoid having to formalize wellbeing with a universal measurement approach (i.e. by assigning specific weights, or importance, to each component of wellbeing), and allows to assess the extent to which planned policies results in equal or unequal positive outcome across the many dimensions of wellbeing (e.g. a model would

measure outcomes on the economic, social, environmental, cultural level without assigning a specific weight, or importance, to each of these components of wellbeing).

Several types of economic models have over the past decades been adapted to move beyond GDP growth and capture concepts of sustainability, including climate adaptation and mitigation, green economy, and SDGs to inform policy makers and national development planning. As indicated above in relation to the three case studies analyzed, to holistically grasp wellbeing components in economic modelling is challenging. This is mainly because wellbeing is a complex concept which adds non-monetary/non-numerical elements such as governance, cultural capability, happiness, ecosystem service valuation and natural capital to the (economic) equation. All these elements are key to consider for informed-decision making and a green and just transformation, but are difficult to quantify.

In the end, models are useful to inform a change in perception and policy making from an exclusive focus on economic growth as the only enabler of wellbeing, to the economy being one component of wellbeing. If human wellbeing is put at the center of policy making, the relevance of intact natural ecosystems and climate sensitive planning becomes imperative. But also gender equality and the vulnerability of groups and inclusiveness are important social dimensions of wellbeing. If economic models take such parameters and data into account, the respective dimensions are made visible and are assigned a value in decision making processes. On the other hand, models should not prescribe which of these dimensions are more relevant or important than others, in absolute terms. In other words, model should inform decision making rather than providing absolute answers.

It is for this reason that this report stresses the need for inter-disciplinary cooperation and active participation (e.g. for provision of data) of civil society stakeholders and state bodies. The process of modelling can, if applied appropriately, be seen as a moderation tool for negotiations and participatory discussions of trade-offs and interdependencies in policy making. It can be a tool to foster social participation.

The next section of this report outlines the main gaps that have emerged from the review of existing models. Annex I provides a more detailed review of IFs and GEM, and the improvements that would be required to better capture the wellbeing economy in these models.

### 3.1 Observed gaps and areas for improvement

With the wellbeing economy being a novel concept, it is not surprising that customized models are not available to evaluate its evolution, progress and possible challenges in Georgia, Kyrgyzstan and Tajikistan. Existing models were designed for different purposes, and present several gaps. Additions to these models, or model-coupling with other methods/models, will be necessary to fully capture the multi-faceted nature of the wellbeing economy, especially concerning governance and the subjective nature of wellbeing.

The following gaps have been identified, and corresponding recommendations proposed, in relation to statistics and models support the preparation of a complete assessment of the progress towards the wellbeing economy in Georgia, Kyrgyzstan and Tajikistan:

- Most models do not simultaneously capture economic, social, human and environmental indicators. Specifically, economic growth, employment, income distribution (poverty and equality), land use and biodiversity, GHG emissions (from energy, land, land use practices, waste, industrial processes), access to public services and resources (e.g. education, health, but also energy, water and green spaces), air quality and water pollution, and governance (including quality of institutions). Regardless of whether the models are sectoral or integrated (i.e. multi-sector models), they should always include social, economic, environmental and possibly also governance indicators to better capture the integrated nature of wellbeing.
- Only a few models capture economic, social, human and environmental capital or stocks, in addition to flows (e.g. forest land, in addition to forestry production, power generation capacity in addition to power generation, education infrastructure in addition to literacy).
- In certain instances, models should be either (i) expanded to capture more sectors and dimensions of development or (ii) coupled with other existing models, those that are compatible in relation to (a) methods for solving equations (e.g. optimization, econometrics or simulation) and (b) treatment of time (e.g. discrete vs. semi-continuous simulation; monthly, annual or 5-year time steps).
- Specifically, the following indicators are found to be missing in most models:
  - At the individual and collective level:
    - Work and job quality, work-life balance, human health;
    - Knowledge and skills, social connections, civil engagements and cultural capability and belonging;
  - At the level of institutions and governance:
    - Civil society participation, central and local governments efficiency, transparency and quality;
  - At the level of wealth/resources for future wellbeing:
    - Natural capital (sum of aggregate land, water, mineral resources, protected areas, biodiversity indicators);
    - Economic capital (financial and physical capital, buildings, bridges, dams, several types of infrastructure);
    - Human capital (education and vocational programs, graduates with specific skills for current and future economic development needs);
    - Social capital (social connections, social networks and social support).
- Certain models can be easily customized, while others are delivered with an “inflexible” set of variables and equations. The subjective nature of the wellbeing economy requires customization at the national, and possibly sub-national level.
- Overall, models can be improved and expanded if reliable data are available. It was reported that the quality of statistics is not always up to the standard required by governments. As a result, information on certain dimensions of wellbeing are not considered in policy making processes (e.g. in the case of Tajikistan this pertains economic inequality and food stocks). Currently, many of the innovative dimensions of the wellbeing economy (governance and other intangible indicators) are not available in national statistics. Awareness should be raised about the wellbeing economy concept, a customization of the definition should be performed, indicators and drivers of change identified (possibly via the use of a multi-stakeholder, co-creation approach, such as Causal Loop Diagrams as implemented in Kyrgyzstan), data collected, and models further developed.

- The functions of model owner and model user should not be separated. It is important to identify a “house” for the model in a ministry or line agency that is directly involved in its use. If the policy process is multi sectoral and inter-ministerial, then joint ownership should be envisaged. This would prevent known issues related to (i) planning being done in silos and (ii) information not being shared transparently across ministries.

In relation to the need to improve and expand the simulation models currently available at the country level, a few considerations should be made. First, when adding new dimensions to a sectoral model, the issue of boundaries emerges. In this respect it is important to assess the extent to which expanding boundaries only adds output indicators (in which case there are no repercussions to the results generated with previous versions of the model) or adds new dynamics, generating feedback loops that were not included in the earlier versions of the model (in this case the results would change, and require a detailed explanation/interpretation). Second, and in addition to the boundaries of the model, the method for solving equations is important. Normally three methods are used: optimization, trend extrapolation (e.g. econometrics) and simulation (e.g. “what if” scenarios). If a new sector is added to an existing model, it is important to evaluate whether the method for solving equations used in the original model also applies to the new sector (e.g. if optimization is used in an economic model, would this be acceptable for the addition of a module on agriculture, or on health care?). Finally, a third and important consideration has to be made in relation to the treatment of time in the model. Two methods are often used: continuous (following the flow of time) and discrete (based on events, or conditions being met) simulations. Further, certain models present results based on annualization (e.g. estimating the net present value of investments) while others present results year per year, where annualization may not be the optimal way to present results (e.g. in relation to the number of people impacted by climate change impacts, and related tangible and intangible costs).

These considerations are important because models are built for different purposes, and sectoral models are constructed using best practice for a given sector and field of work. When using a systemic approach models have to cut across boundaries, both in relation to science and policies, and caution should be taken to ensure that model results are valid and relevant (i.e. model outcomes can be defended, explained transparently and interpreted correctly).

# 4. INCLUDING WELLBEING ELEMENTS INTO MODELLING ACTIVITIES AND TECHNICAL ADVICE

## Key messages

- Eight steps are proposed for the integration of the wellbeing economy concept and indicators in economic models, ranging from awareness raising (1), to model customization (6), to interpretation of results and accompanying policy process (8).
- Recommendations include the need (a) to assess at what stage of the policymaking process is the recipient country; (b) to evaluate the extent to which quantitative modeling can inform policymaking; (c) to identify what opportunities exist for the endorsement and adoption of wellbeing economy indicators and models.
- Opportunities exist also for the use of wellbeing economy indicators and models in shaping policy. For instance, good performance on wellbeing could result in incentives, for instance in relation to easier or cheaper access to credit, access to tax incentives. This would be similar to the process currently applied to climate finance, but expanded to cover a variety of additional indicators.
- Finally, models can be used to support MRV processes, and policy impact assessment more in general. By generating forecasts, models allow to formulate expectations about the impact of policy and investment. With policy impact assessment becoming more frequently used and mandated, early adoption of wellbeing economy models will increase the creation of ownership and accountability at the country level.

## 4.1 Step by step guidance to better represent the wellbeing economy in economic models

Given the comprehensive nature of the wellbeing economy concept, which is at odds with the sectoral or thematic boundaries of most present simulation models, the following steps are proposed for the creation of new integrated models, the expansion of existing ones, or the coupling of available models:

### Step 1. Awareness raising about the wellbeing economy concept

Every model is built for a purpose, and every model can inform decision making, for a variety of policy processes. It is important to raise awareness about the wellbeing economy so that it can be embedded in policymaking processes. This will allow to define targets, actions and investments, all of which can be analyzed with simulation models.

Currently, within the broad concept of sustainability, the economic and social dimensions prevail. Together with economic growth, poverty, health and social protection, and education are the main priorities for sustainable development, as indicated by the literature review carried out in Georgia. As in the case of the SDGs, it is important to expand the boundaries of policymaking, not only to take into account all social, economic, environmental and governance dimensions, but also to shift the focus to social outcomes, as being driven, in a mutually reinforcing manner, by the performance of the economy, quality of the environment and natural capital, and the level of good governance.

## **Step 2. Customization of the definition at the national level**

Once the wellbeing economy concept becomes mainstream in policymaking, a local definition that is aligned with national development goals, and the unique local cultural context can be formulated. The process should be inclusive, based on a multi-stakeholder approach, given the subjective nature of wellbeing. Having a local definition allows to begin the identification of key policy targets and aspirations, and paves the way for the quantification and assessment of performance to date. Further, a customized and comprehensive definition of wellbeing economy allows to expand the boundaries of quantitative policy analysis (see sections 2.2 and 2.4 on indicators, and 3.1 on models).

## **Step 3. Identification of indicators and drivers of change**

With the formulation of a customized definition of the wellbeing economy, indicators can be identified to assess its historical performance as well as to forecast future pathways under scenarios of action and inaction (see section 2.2. and 2.4). In alignment with the multi-stakeholder approach required to formulate a definition, the identification of indicators should also involve various stakeholders, and use a co-creation approach, such as Causal Loop Diagrams (CLD) (see Figure 5). This tool has been used in Kyrgyzstan, in relation to the Green Economy Program, and in several other countries in the context of low carbon development planning, to create a shared understanding, identify key indicators and their interdependence.

## **Step 4. Formulation of a scenario building, and forecasting method**

Indicators shed light on how performance for the wellbeing economy can be measured. Data and models can quantify values for such indicators, allowing to interpret and evaluate both historical trends and future scenarios. Concerning the latter, being particularly relevant to inform agenda setting, policy formulation and policy assessment (3 of the 5 main steps of the policymaking process), indicators can be used to determine what method/model/equations/data to use in forecasting exercises (ex-ante policy analysis). The choice of methods and models should also consider the knowledge of models found at the country level, within line ministries and at other stakeholders.

## **Step 5. Data collection**

Data availability is essential for model parametrization and validation. If data are not available to measure the wellbeing economy, a process should be initiated to collect and verify historical information, especially pertaining soft variables (e.g. for the social and governance dimensions). On the other hand, synergies can be found with data being collected for the SDGs, and with newly introduced System Of Environmental and Economic Accounts (SEEA), and particularly the Ecosystem Accounts (EA).

## **Step 6. Model development**

After the formulation of scenarios and identification of the forecasting method, and having assessed data availability, it is possible to proceed with model development. This can include the addition of new variables and modules to existing models, or model coupling (soft or hard) (see section 3.1 and 3.2). In the latter case, different models can be used in conjunction with one another (e.g. the outputs one model can be used as an input for other models, while taking care of aligning the underlying scenario assumptions of all models). The goal would be to include in the simulation model as many of the indicators that can be used to measure the wellbeing economy at the national level as possible.

In relation to model development, and especially if the additions expand the boundaries of the model to different fields of research and analysis, it is important consider both (i) model ownership, (ii) model users and (iii) model developers. The sharing of data, and a joint analysis of results (to assess, in a transparent way, the pros and cons of each scenario for several line ministries and other stakeholders) is essential.

## **Step 7. Validation and simulation of the baseline and alternative scenarios**

Once the model creation process is complete, the additions as well as simulation results (considering cases of inaction, e.g. the Business As Usual (BAU) scenario, and a series of alternative policy cases) have to be validated using a transparent, multi-stakeholder, participatory approach. The more the model and the analysis are cross-sectoral, the more stakeholders across research fields and policy domains should be involved in the validation process, which includes both the model (structural validation) and its results (behavioral validation).

## **Step 8. Interpretation of results and accompanying policy process**

It is very important to embed the wellbeing economy concept in ongoing policy process. This will give purpose to the modeling work. On the other hand, the wellbeing economy should be embedded in several, if not all policy processes going forward, both national and sectoral. For this reason, and for the model to be used with the goal to inform policymaking, policy briefs and policy impact assessments should be prepared on an ongoing basis. This would also allow to retain knowledge about the model, both in relation to its technical and policy analysis capabilities.

## **4.2 Recommendations for scaling up efforts in policy advice/technical cooperation**

This report provides two main contributions: (i) it sheds light on the concept of wellbeing economy, and (ii) it assesses the potential for the use of quantitative models as a tool to inform decision making. Wellbeing economy is a relatively new concept that can be coupled with other development objectives, e.g. climate mitigation and climate adaptation, stressing the human dimension. Similarly, wellbeing is a concept that is not well represented in the simulation models that are currently used to inform decision making for sustainable development.

As a result, and with the goal to scale up of efforts in policy advice and technical cooperation, in the context of development planning, a series of steps was proposed in section 4.1. It is recommended, in order to move effectively towards a wellbeing economy, to assess and implement these steps both in policy and project assessments<sup>8</sup>.

Specifically, it is critical to assess at what stage of the policymaking process is the recipient country. For instance, if the concept of wellbeing economy is novel, it would be advisable to start from step 1, with awareness raising and the socialization of the concept. On the other hand, in a case in which the wellbeing economy is already found in national documents and it is measured with statistics, it is possible and advisable to start country engagement with step 4, on the formulation of scenarios that can support agenda setting for development (with people at the center, when adopting a wellbeing approach).

It is then also essential to assess the extent to which quantitative modeling can inform policymaking. For instance, the following questions should be considered: are models already available at the country level that can effectively assess the effectiveness of intervention options aimed at improving wellbeing? Would model improvements be required, and if so, are data available to support this activity? Is there a platform for the implementation of a transparent, multi-disciplinary, multi-stakeholder and co-creation approach to model development?

Besides implementation steps, it is important to consider what opportunities exist for the endorsement and adoption of wellbeing economy indicators and models. Practically, if information on the impact of policies and investments on wellbeing becomes available, how would policy analysis change? Could it be that a policy that seems ineffective, when using a conventional and sectoral model, actually turns out to be very effective and economically viable from a societal perspective when a more complete set of wellbeing indicators is used? This is important to know, in order to assess what the most effective entry point(s) could be for the use of an expanded list of indicators and improved simulation models. Considerations along these lines could be made both for public policy (e.g. what could change in Kyrgyzstan if the new GE program were to use wellbeing indicators?) and private sector investment (e.g. what is the societal performance of an investment that reduces environmental damage and human health costs resulting from air and water pollution?).

Further, wellbeing indicators could be used to stimulate investments, rather than being limited to support in policy formulation and assessment. For instance, once indicators and models are available it would be possible to assess the performance of a private sector company on wellbeing. Good performance could result in incentives, for instance in relation to easier or cheaper access to credit, access to tax incentives, etc. This would be similar to the process currently applied to climate finance, but expanded to cover a variety of additional indicators.

Finally, models can be used to support MRV processes, and policy impact assessment more in general. By generating forecasts, models allow to formulate expectations about the impact of policy and investment. Over time, after implementation of policies and investments, data can be collected to assess if expectations have been met. With policy impact assessment becoming more frequently used and mandated, early adoption of wellbeing economy models will increase the creation of ownership and accountability at the country level.

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<sup>8</sup> Other examples exist that offer information on how to make use of economic modeling in policymaking. A relevant example is "Using Climate Economic Modelling for Sustainable Economic Development: A Practitioner's Guide" published by GIZ in 2021. <https://www.giz.de/en/downloads/giz2021-en-climate-economic-modelling-practitioners-guide.pdf>

# BIBLIOGRAPHY

1. Bassi, A. (2015). Moving towards integrated policy formulation and evaluation: The Green Economy Model. *Rigas Tehniskas Universitates Zinatniskie Raksti*, 16, 5.
2. Capitals Coalition. (n.d.). Retrieved from <https://capitalscoalition.org/>
3. Chrysopoulou, A. (2020). The Vision of a Well-Being Economy. *Stanford Social Innovation Review*.
4. Dalziel, P., & Saunders, C. (2014). *Wellbeing economics: future directions for New Zealand*. Bridget Williams Books.
5. European Commission. (2019). *Infographic - The Economy of Wellbeing: going beyond GDP*. Retrieved from <https://www.consilium.europa.eu/en/infographics/economy-wellbeing/>
6. GIZ. (2022). *Supporting climate resilient economic development in Georgia. Application of the e3.ge model to analyze the economy-wide impacts of climate change and adaptation*. GIZ. Retrieved from GIZ: <https://www.giz.de/en/downloads/giz2022-en-supporting-climate-resilient-economic-development-georgia.pdf>
7. Lutz, C., Zieschank, R., & Drosdowski, T. (2017). Measuring Germany's Transition to a Green Economy. *Low Carbon Economy*, 8(1), 1-19.
8. OECD. (2019). *The Economy of Well-Being*. Retrieved from Organisation for Economic Co-operation and Development: <https://www.oecd.org/about/secretary-general/the-economy-of-well-being-iceland-september-2019.htm#:~:text=The%20Economy%20of%20Well%20Being%20is%20defined%20as%20the%20'capacity,%20being%20investments%20over%20time'>
9. OECD. (n.d.). *Measuring Well-being and Progress: Well-being Research*. Retrieved from Organisation for Economic Co-operation and Development: <https://www.oecd.org/wise/measuring-well-being-and-progress.htm#:~:text=The%20measuring%20well%20being%20agenda,direct%20bearing%20on%20people's%20life>
10. The Treasury. (2021). *Our Living Standards Framework*. Retrieved from <https://www.treasury.govt.nz/information-and-services/nz-economy/higher-living-standards/our-living-standards-framework>
11. World Bank. (2021). *The Changing Wealth of Nations 2021: Managing Assets for the Future*. The World Bank.
12. WWF. (2020). *TOWARDS AN EU WELLBEING ECONOMY*. Retrieved from World Wildlife Fund: [https://wwfeu.awsassets.panda.org/downloads/wwf\\_eu\\_wellbeing\\_economy\\_report.pdf](https://wwfeu.awsassets.panda.org/downloads/wwf_eu_wellbeing_economy_report.pdf)

# ANNEX I: REQUIRED IMPROVEMENT FOR THE INTERNATIONAL FUTURES (IFS) MODEL AND GREEN ECONOMY MODEL (GEM) FOR THE FULL INTEGRATION OF WELLBEING

This annex presents an assessment of the changes required to two models used in Kyrgyzstan, IFs and GEM, for a more complete representation of wellbeing in the models.

Key concept	To be considered in IFs	To be considered in GEM
<b>Individual level</b>		
Safety	No need to add more concepts, but, perhaps, disaggregation of unintentional injuries further into climate-related and non-climate related could be used for a more accurate estimation of climate influence on health and economy.	Injuries, separately from traffic, disasters, crime, which can all be linked further with climate, population and economic modules.
Health	There is a health module incorporated in IFs, including Group I – Communicable, Maternal, Perinatal, and Nutritional Conditions, Group II – Non-communicable Diseases, and Group III – Injuries (same link as safety).	Several concepts can be incorporated, such as fertility, number of chronic illnesses per person, number of malnourished people, mortality from cardiovascular diseases, cancer, diabetes, chronic respiratory diseases, which will be linked to life expectancy.
Housing	Availability of square meters of housing per person could be added, separated into individual and multi-apartment and further into connected to different types of amenities, such as clean water and canalization access, heating type, etc. These can be linked to energy and health modules.	Availability of square meters of housing per person could be added, separated into individual and multi-apartment and further into connected to different type of amenities, such as clean water and canalization access, heating type, etc. These can be linked to energy and health modules.
Income and wealth	Already in the model.	Already in the model, but perhaps disaggregation by gender, income class, could be added.

Key concept	To be considered in IFs	To be considered in GEM
Environment quality	Additionally to forest area and renewable water resources, it is recommended to add indicators of water, air and soil quality, and to connect them to health module. Additionally, area of greenery per capita in the cities, number of open (or unregistered) landfills around the city, biodiversity index can be added.	Already included are air pollution indicator, soil quality indicator, surface and ground water stocks in natural capital, and it is recommended to add water quality, forest area, area of greenery per capita in the cities, number of open (or unregistered) landfills, biodiversity index, perhaps also disaggregated by region.
Work and job quality	More explicit indicators of employment level and job satisfaction should probably be added.	Incorporation of job quality and skill requirements.
Work-life balance	More explicit indicators of work-life balance should be added.	GEM can either look at IFs approach, based on World Values Survey (Inglehart 1997), or use existing data on Time Budget Survey, employment rate and future specific surveys.
Knowledge and skills	No additional indicators are needed, but the approach can be discussed.	Education module and different industry employment should be included.
Social connections	No additional indicators are needed, but the approach can be discussed.	IFs general approach can be considered, but it perhaps should also take into account existing cultural norms, such as clans, etc.
Civil engagements	More explicit indicators of civil engagements – paid and unpaid forms of political activism, environmentalism, and community and national service should be added.	Number of NGOs/ people employed by NGOs, rate of voter turnouts at all levels can be aggregated to an index.
Cultural capability and belonging	No additional indicators are needed, but the approach can be discussed.	An index, taking into account 2-3 largest ethnic groups, level of ethnic language proficiency, and acceptance as official should be taken into account.
Subjective wellbeing	No surveys, but Physical Quality of Life (PQLI) is contained in socio-political module.	An index should be added, taking into account number of mental illnesses and diseases, and surveys if possible.

Key concept	To be considered in IFs	To be considered in GEM
<b>Institutions and governance level</b>		
Families and households	No additional indicators are needed, but the approach can be discussed.	Rate of marriages and divorces, perhaps average married life expectancy, average number of children per family.
Firms and markets	No additional indicators are needed, but the approach can be discussed.	A representation of firms and markets is needed, perhaps through number of firms in the market, their size, share in GDP, etc.
Central and local governments	No additional indicators are needed, but the approach can be discussed.	Dimensions of governance can be added: security, capacity, and inclusion, number of interstate conflicts, credit rating of the country, corruption index and citizen trust surveys, as well as percent of women and other groups in power.
International connections	No additional indicators are needed, but the approach can be discussed.	% of trade of GDP, % of workforce migration and exchange, number of cooperation agreements, cooperation/conflict relationships should be added.
<b>Wealth/resources for future wellbeing level</b>		
Natural capital	Additionally to forest area and renewable water resources, it is recommended to add indicators of aggregate land, biodiversity stocks, perhaps even climate.	Surface and ground water stocks (renewable water resources) are included in natural capital. Aggregate mineral resources, protected areas, biodiversity indicators should be added.
Economic capital	Capital, labour, accumulated technology are accounted for in Goods and Services market under Economics module.	Capital and labor are represented for agriculture, industry and services, aggregated.
Human capital	More direct indicators of human capital are needed, such as rate of return on human capital, as well as cultural dimension.	Perhaps rate of return on human capital, or % of labor costs of company revenue, or more cultural indicators should be added, such as volunteers after pension age, number of higher education, PhDs, poets, sport stars, musicians, number of inventions or patents per capita, number of local writers, etc.
Social capital	No additional indicators are needed, but the approach can be discussed.	Indicators of groups and networks; trust and solidarity; collective action and cooperation; information and communication; social cohesion and inclusion; empowerment and political action.

**Published by:**  
Deutsche Gesellschaft für  
Internationale Zusammenarbeit (GIZ) GmbH

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**Programme/project description:**  
Sector Network Sustainable Economic Development and Employment in South-  
East Europe, the Caucasus, Central Asia and Afghanistan (SENECA SEDE)

**Author:**  
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**Design/layout:**  
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**Credits/sources:**  
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On behalf of  
German Federal Ministry for Economic Cooperation and Development (BMZ)

German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety  
and Consumer Protection (BMUV)

December 2022



Deutsche Gesellschaft für  
Internationale Zusammenarbeit (GIZ) GmbH

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