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Social Accounting Matrix – Methodological Basis for Sustainable Development Analysis

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1. Introduction

The Rio Summit established sustainable development as the guiding vision for the development efforts of all countries. At Rio, and in later commitments, all governments undertook to establish and implement national sustainable development strategies. The strategies for sustainable development, called for at Rio, are foreseen as highly participatory instruments intended "to ensure socially responsible economic development while protecting the resource base and the environment for the benefit of future generations".¹

In simple terms, sustainable development means **integrating the economic, social and environmental objectives of society**, in order to maximize human well-being in the present without compromising the ability of future generations to meet their needs. This requires seeking mutually supportive approaches whenever possible, and making trade-offs where necessary.

Sustainable development is not an activity that has to be left to the long term. Rather, it constitutes a set of short, medium and long term actions, activities and practices that aim to deal with immediate concerns while at the same time address long-term issues. Achieving sustainable development requires far reaching policy and institutional reforms and the involvement of all sectors at all levels. Sustainable development is not the responsibility of only government or one or two sectors of society.

However, in order to better understand the sustainable development concept, one has to develop an appropriate methodological instrument. In parallel with the introduction of the sustainable development concept, the SNA 1993 introduced the Social Accounting Matrix (where later its extensions, the SESAME and NAMEA approaches, have been developed) as a methodological basis for the sustainable development analysis.

Therefore, the following chapter will firstly present the theoretical foundations of the Social Accounting Matrix (SAM) and its extensions (SESAME and NAMEA approach), and secondly, will present possibilities to implement these approaches in the Republic of Macedonia.

¹ OECD, 2001, p. 11

2. Theoretical considerations

The development planning methodology is of highest importance for the unity, complexity and consistency of the sustainable development planning system. It should enable methodological consistency in the process of evaluation of the development conditions, problems and perspectives, perception of interests, objectives and tasks of the relevant stakeholders and their harmonization, the simultaneity of the planning process, as well as the mandatory preparation and execution of plans. Having this in mind, part 2 of this chapter will present the theoretical foundations of the Social Accounting Matrix (SAM) and its extensions (the SESAME and NAMEA approaches).

2.1 Social Accounting Matrix (SAM)

Social accounting matrix (SAM) is a technique related to national income accounting, providing a conceptual basis for examining both growth and distributional issues within a single analytical framework in an economy. It can be seen as means of presenting in a single matrix the interaction between production, income, consumption and capital accumulation.

A SAM is defined as the presentation of System of National Accounts (SNA) accounts in a matrix which elaborates the linkages between a supply and use table and institutional sector accounts. In many instances SAMs have been applied to an analysis of interrelationships between structural features of an economy and the distribution of income and expenditure among household groups. Evidently, SAMs are closely related to national accounts whereby their typical focus on the role of people in the economy may be reflected by, among other things, extra breakdowns of the household sector and a disaggregated representation of labour markets (i.e., distinguishing various categories of employed persons). On the other hand, SAMs usually encompass a somewhat less detailed supply and use table or input-output table.²

The SAM is a comprehensive, flexible, and disaggregated framework which elaborates and articulates the generation of income by activities of production and the distribution and redistribution of income between social and institutional groups. A principle objective of compiling a SAM is, therefore, to reflect various interdependencies in the socio-economic system as a whole by recording, as comprehensively as is practicable, the actual and imputed transactions and transfers between various agents in the system. The SAM has, mainly, two basic tasks:

- a. to enable presentation of information about the economic and social structure of the national economy; and
- b. to provide analytical and accounting framework as a basis for construction of macroeconomic models for analyzing the national economy and the effects from the implementation of the macroeconomic and development policy measures.

The increasing interest of recent years in the compilation of this kind of accounting system is intimately related to growing dissatisfaction with the results of growth and development policies. These disappointing results, especially as regards their distributional aspects, gave rise to questions concerning the processes and mechanisms by which the production of

² European Commission et al., 1993, 20.4

goods and services, and their distribution and redistribution relate to each other. To examine these kind of question on an empirical basis, data were required that would provide a coherent, detailed and consistent picture of all these aspects of the economic process.

The fundamental principle of SAM is balancing within the series of national accounts, whereby revenues and expenditures are presented for each individual account. SAM follows the principles of "single entry" and presents a series of accounts presented in the form of matrix. SAM consists of rows and columns marked with identical titles. The rows and columns present different accounts in the economic system. For each account, and hence, for each pair of row and column, the data in the row shows the revenue (inflow) on the account, and the data in the respective column is an expenditure (outflow) on that same account. Expenditures in one account are revenues in the other and vice versa. In sum, within each economic system, all revenues must correspond to the respective expenditures, i.e. the correspondent rows and columns must be equal. In other words, each component (data) of SAM is revenue for the account in the row, and expenditure for the account in the column (Table 1).

The above presented points to a conclusion that the SAM provides quantitative information on the following aspects of the economic process:

- the relationship between various types of production activities and various factors of production from the aspect of generation and allocation of income;
- total income received by various factors of production;
- allocation of incomes to factors of production between separate institutions via taxes, welfare, transfers;
- consumption of goods and services among certain institutions;
- total supply of goods and services from the domestic and foreign markets;
- savings and capital transfers among institutions, etc.

As a conclusion, one can point out to the following:

1. SAM successfully combines indicators of growth, allocation of income and poverty in one coherent framework. By including elements of input-output table, national accounts and other databases, SAM provides complex quantitative image suitable for macroeconomic analysis and planning;
2. SAM is a useful tool for harmonizing various sources of data and filling the gap in information received from various statistical databases, thus contributing to greater consistency and adequacy;
3. SAM proved its usefulness as an integrated statistical database suitable for preparation of macroeconomic models of the national economy to the end of better understanding and envisaging the interrelationship of the determinants of economic trends in the national economies.

2.2 SESAME approach

SESAME (System of Economic and Social Accounting matrices and Extensions) is a statistical information system in matrix format, from which a set of core economic, environmental and social macro-indicators is derived. The system is driven, to a large

accounts	goods/ services	Production	generation of income	allocation of primary income	Allocation of secondary income	use of income	capital	rest of world	total
goods/services		Interme-diate Consu-mption				final consu-mption	gross capital formation	export of goods/ services	total demand
production	output and taxes on products less subsidies								total output
generation of income		net domestic product						compensation of employees from ROW	generated income
allocation of primary income			Compensation of employees, taxes on products and import, subsidies, net operating surplus/net mixed income	property income				property income from ROW	total primary income
allocation of secondary income				net national income	current taxes on income, wealth and current transfers			current taxes on income, wealth and current transfers from ROW	total secondary income
use of income					net disposable income	adjustment for change in net equity of households on pension funds		Adjustment for change in net equity of households on pension funds from ROW	disposable income
capital		Deprecia-tion				net saving	capital transfers and acquisitions less disposals of non-produ-ced assets	capital transfers, receivable(=)// payable (-) and acquisitions, less disposals of non-produ-ced asset from ROW	capital transfers
rest of world	import of goods/ services		compensation of employees to ROW	property income for the ROW	current taxes on income, wealth and current transfers for ROW	adjustment for change in net equity of house-holds on pension funds for ROW	Net lending (+)/net borrowing (-) of the national economy		total outflow to ROW
total	total supply	total input	Allocation of generated income	Alloca-tion of primary income	allocation of secondary income	Allocation of disposable income	capitalexpenditures	total inflow from ROW	

Table 1. Schematic presentation of a SAM

extent, by the kind of information required for monitoring and policy-making at the macro-level. Although it is impossible to capture socio-economic development in a single indicator, it is equally clear that a prime task of national statistical offices is to comprise the countless numbers they collect to a manageable, "executive" summary. Such a summary typically describes trends in main indicators. At the same time, for analytical purposes a more detailed data framework is required. Obviously, the communication between policy-makers and analysts is optimally served if the core macro-indicators are all derived from an integrated information system such as SESAME.³

Keuning, in his paper⁴, points out to the fact that, essentially, SESAME integrates economic, social and environmental accounts and indicators, through a conceptual and numerical linkage of related monetary and non-monetary data. It extends the SAM by integrating related information, in non-monetary units. For instance, compensation of employees by industry and labor category in the SAM is broken down into hours worked and an average hourly wage rate. In turn, these hours worked for payment are related to other time use of the employed persons concerned. Subsequently, time use of the employed persons can be combined with the time use of the other members of the same household (group), to arrive at a comprehensive linkage of (social) time use data and (economic) income figures.

Moreover, Keuning states that, in order to achieve a linkage between monetary and non-monetary data, the SAM-values are broken down into price (changes) and volume (changes). The linkages with other data are thus typically established in non-monetary units such as hours, calories, and "volume" changes. In this way, the necessary connections are made without distorting the essentially monetary system of the national accounts. A SESAME registers for all variables both the national total value and its distribution among socio-economic household groups, categories of employed persons, etc. As a next step, a range of summary indicators can be derived from such a data set (e.g. Gross Domestic Product, population size, (un)employment, inflation, balance on current account of the balance of payments, income inequality, environmental indicator(s), daily calorie intake of the poorest subgroup, average number of years of schooling). Consistent indices covering distributional aspects can also be derived for all variables included in the system. Whatever set of aggregates is preferred, they would all share two crucial features: first, every indicator is computed from a single, fully consistent statistical system, and secondly, each indicator uses the most suitable measurement unit for the phenomenon it describes.⁵

As a summary, Keuning⁶ points out to the following advantages of the SESAME approach:

- SESAME can serve as a useful extension to present-day national accounts, in two respects. First, the SAM-part of SESAME improves the compilation of national accounts, because it integrates more basic sources at a meso-level. Secondly, SESAME is useful for integrating all kinds of (non-monetary) social and environmental statistics.

³ Keuning, 1998, pp. 353-354

⁴ Keuning, 1998, pp. 353-354

⁵ Keuning & Timmerman, 1995, pp. 3-5

⁶ Keuning, 2000, pp. 289-290

- Just like conventional national accounts, *SESAME provides both core macro-indicators and an underlying information system*. In this way, it simultaneously serves two categories of user: first, the general public, media and policy makers, who want to know the main trends at a glance, and secondly, the analysts, scientists and policy-advisers, who want to disentangle causes and consequences, make forecasts and do policy simulations.
- *SESAME promotes the use of uniform units, classifications, concepts, etc. throughout a statistical system; that is, not only in economic statistics, but also in social statistics.* Among the advantages of such a harmonization is a much easier matching of results from different surveys. As a consequence, fewer questions per survey and perhaps even smaller samples are needed. It is likely that some groups of specialized users will prefer a different classification or concept for their specific field of interest. However, only an integrated data system can be qualified as a pure public good and therefore the compilation of data according to special purpose specifications might receive a lower priority in official statistics, or be financed to a larger extent by the beneficiaries.
- *SESAME is an inherently flexible framework.* It can readily be adapted to the specific characteristics, needs and capabilities of every country or region. In particular the accounting structure, the classifications and the kind of non-monetary phenomena incorporated can be tailor-made. Because of this modular approach, it is not necessary to include all aspects at once.
- Finally, it should be mentioned that *SESAME essentially aims at a better use, through integration, of existing statistics.* In turn, by integrating information that is already collected, official statistical agencies will increase their own value added.
- Just like present-day national accounts, *SESAME is a multi-purpose information system that can be used to test any economic or social theory.* It is this property that has made the national accounts the universal language of economics. *SESAME may open the door to even richer insights into human welfare.*

2.3 NAMEA approach

The economy is a complex system of which extraction of natural resources, production, consumption, technology, investment, imports and exports, and release of wastes (and pollution) are just a few of the many different interrelated dimensions. All these different aspects of the economy may have detrimental or beneficial effects on environmental pressures. Hence, there is a pressing need for promoting integrated economic and environmental information systems as opposed to indicators' lists in order to meet the increasing users' demand for conducting integrated economic and environmental policies. They reiterated that environmental-economic accounting would provide the necessary framework for analysing the impact of economic growth on long-term sustainable development.

The need to account for the environment and the economy in an integrated way arises because of the crucial functions of the environment in economic performance and in the generation of human welfare. These functions include the provision of natural resources to production and consumption activities, waste absorption by environmental media and environmental services of life support and other human amenities.

Having this in mind, in 1989 Statistics Netherlands started to develop a system for describing environmental aspects in conjunction with the national accounts. The system, known as the National Accounting Matrix including Environmental Accounts (NAMEA), creates a link between the national accounts and environmental statistics. NAMEA shows the relationship between a number of important economic indicators (gross domestic product, balance of payments, etc.) and the environment.

The NAMEA has been developed to systematically supplement the national accounts with environmental statistics. Its hybrid accounting structure, i.e. the combined presentation of physical and monetary accounts, indicates that in the NAMEA environmental imputations in the core national accounts framework are avoided.

Therefore, NAMEA has been developed to link environmental and economic statistics. An important characteristic of environmental accounting is that the data are consistent with the National Accounts which mean that the environmental data can be directly compared to well known macro-economic indicators such as GDP, inflation and investment rates, developed in the System of National Accounts (SNA).

The NAMEA system contains no economic assumptions; it is only descriptive. It maintains a strict borderline between the economic and the environmental aspects. It is represented in monetary units, on the one hand, and in physical units, on the other. To get a clear understanding of the interrelationships between the natural environment and the economy, we must use their physical representation. Otherwise, it is impossible to understand these relations. If the NAMEA system would contain monetary values about environmental problems, two problems would occur. Firstly, the environment must be valued in monetary units and secondly it is very complicate to differentiate between price changes and quantity changes.

Therefore, the resulting indicators are measured in physical units. The interrelationship between the economy and the environment has two perspectives, an economic one and an environmental one. The **economic perspective** contains the physical requirements in the economic processes, like energy and material and spatial requirements. The **environmental perspective** puts forward the consequences of these requirements with respect to the availability of the natural environment. Consequently, the optimal allocation of natural resources requires the consideration of both perspectives.

NAMEA is a tool to account for environmental problems combining the data from the environment with the economic data from the core of the SNA. However, no specific economic assumptions are used to compile a NAMEA. Policy-makers are free to decide which kinds of environmental themes and environmental substances should be investigated, and policy-makers should decide how they want to resolve the environmental problems. As a result, the NAMEA does not only produce aggregate indicators in a consistent meso-level information system, it also provides data in the required format for all kinds of analyses.

Two accounts for the environment have been added to the national accounts matrix in the NAMEA: a *substances account* and an *account for environmental themes*. These accounts contain observed environmental data in physical units (emissions and waste in kg and

energy use in joules). They show not only emissions (pollution originating from products and consumers), but also immissions (for example, deposition of pollutants) in the environment.

The substances account explains the relationship between the amount of environmental stress attached to current economic transactions and the amount of environmental stress that potentially threatens all properties of resident entities including economic assets, health and the national ecological heritage.

The environmental theme account is denominated in physical units and focus on the consistent presentation of material input of natural resources and output of residuals for the national economy. These inputs and outputs are the environmental requirements of the economy. In the environmental themes account, substances are grouped and aggregated in accordance to their type of environmental stress and subsequently represented in a limited number of aggregated theme indicators. Most themes correspond to national or local environmental problems and the corresponding indicators reflect the net accumulation of pollutants within the country's borders. For global environmental themes, i.e. greenhouse effect and ozone layer depletion, the indicators only review the weighted pollution generated by economic agents that belong to the national economy, representing the national contribution to these global problems. Consequently, for some of the environmental themes it is relevant and possible to determine the total amount of pressure that is put on the national environment in a single accounting period. However, the accounts do not show the actual damages that may result (now or later) from these pressures. By the presentation of the economic accounts in monetary terms and the environmental accounts in the most relevant physical units, the NAMEA maintains a strict borderline between the economic sphere and the natural environment.⁷

De Haan, in his paper⁸, points out to the following main characteristics of the NAMEA:

Firstly, the NAMEA maintains a strict borderline between the economic sphere and the natural environment, established by monetary accounts on the one hand and accounts denominated in the most relevant physical units on the other. The non-monetary accounts show the environmental requirements of an economy, which are not subject to market transactions and which are for that reason not included in the core national accounts. Similarly, the physical flows underlying commodity transactions do not enter the accounts for environmental requirements.

Secondly, the NAMEA maintains a clear distinction between physical inputs (extraction of resources) on the one hand and outputs (emission of pollutants) on the other.

Thirdly, most NAMEAs contain environmental themes account in which substances are grouped together and aggregated in accordance to the type of environmental pressure to which they are expected to contribute. In this way, a wide range of substances are represented by only a limited number of aggregated theme indicators on the basis of weighting methods.

⁷ de Haan & Keuning, 2000, pp. 3-5

⁸ de Haan, M, 2004, pp. 84-86

Finally, the NAMEA provides an institutional representation of the economy and its relationship with the environment. This implies that economic activities together with their environmental requirements are defined and subsequently recorded according to statistically observable units, *i.e.* the so-called establishments classified according to the International Standard Industrial Classification (ISIC).

3. Recommendations for the Republic of Macedonia

There is an urgent need for implementation of macroeconomic indicative planning in the Republic of Macedonia, as a transition country, where the Government should implement managerial activities in the public sector, public finances, etc. A basis for such indicative economic planning is the macroeconomic policy document of the Government, which provides instruments necessary for the realization of the predetermined medium and long-term development goals. The macroeconomic planning document of the Government should be a programme for the Government medium-term economic and social policy, with clearly specified activities for the: public investments, public enterprises, local economic development, social assistance, public revenues and expenditures, etc. This system of indicative economic planning is compatible with those already existing in the market-based economies and enables realization of the Government medium and long-term socio-economic development goals.

Hence, indicative planning methodology has a significant importance on the coherency, complexity and consistency of the national planning system in the Republic of Macedonia. It enables the consistency during the process of obtaining information about the development conditions and problems, adjustment of the policy-makers' tasks and goals, as well as the preparation and realization of the socio-economic development plans and programs.

Therefore, in order to satisfy the abovementioned, it is necessary the effort of the scientists and experts in our country to be focused on preparation of a complex analytical framework, consisting of:

- a. Preparation of a highly disaggregated Social Accounting Matrix (SAM)
- b. Preparation of a SAM extended with social indicators (SESAME approach)
- c. Preparation of a SAM extended with environmental indicators (NAMEA approach)

Consequently, the focus, in the third part of this chapter, will be put on the activities that should be carried out in order to enable implementation of an efficient process of preparation and elaboration of the abovementioned analytical and methodological documents.

3.1 Social accounting matrix (SAM) for the Republic of Macedonia

At the moment, there is no Social Accounting Matrix (SAM) for the Republic of Macedonia. But, there is time series data with a set of sectoral accounts (from the production to the capital account, for five domestic institutional sectors and rest of the world sector), as well as, a high quality time series data for the national accounts

Hence, it is due time the State Statistical Office, together with the relevant ministries in the Government and experts from the scientific and educational institutions in Macedonia, as well as with institutions and experts from the developed market economies to start the

preparation and construction of a highly disaggregated SAM for the Republic of Macedonia, based on the positive experiences of the developed market and transition economies. The SAM for the Republic of Macedonia would mainly have two basic tasks:

- a. to enable presentation of information about the economic and social structure of the national economy; and
- b. to provide analytical and accounting framework as a basis for construction of macroeconomic models for analyzing the national economy and the effects from the implementation of the macroeconomic and development policy measures.

The SAM for the Republic of Macedonia would be a matrix presentation of the transactions in the socio-economic system. The SAM is a comprehensive, flexible, and disaggregated framework which elaborates and articulates the generation of income by activities of production and the distribution and redistribution of income between social and institutional groups. A principle objective of compiling a SAM is, therefore, to reflect various interdependencies in the socioeconomic system as a whole by recording, as comprehensively as it is practicable, the actual and imputed transactions and transfers between various agents in the system. Hence, couple of activities are of significant importance for our country:

- creation, harmonization and implementation of an integrated analytic-accounting framework as a basis for planning, programming and decision-making for the future socio-economic development of the Republic of Macedonia, based on the United Nations SNA and harmonized with the system and methodology for planning, analyses and decision-making in the developed market economies;
- affirmation of the role and the importance of the SNA and the SAM for the methodology for preparation, adjustment and implementation of the macroeconomic and development policy and planning documents in the national economy;
- construction of a SAM for the Republic of Macedonia, based on a comparative analysis of the SAM construction and implementation experiences in the developed market and transition economies.

3.2 SESAME for the Republic of Macedonia

Since 1991, the Republic of Macedonia has been going through a difficult period of transition, from a command to a market economy. This process has resulted in high unemployment rates and increasing levels of poverty. Hence, it is fair to say that unemployment in Macedonia is one of the gravest and most difficult economic, social and political problems. Despite significant progress in macroeconomic stabilization, job creation has been limited, while changes in the sectoral structure of employment and labor reallocation from less to more productive jobs have been modest. This ongoing situation imposes a real necessity for the SESAME approach implementation in the Republic of Macedonia.

The above mentioned is made possible through the main socio-demographic module of the SESAME approach. The main goal of this module is to present the interaction between the economic and demographic changes in the national economy, including the quantitative

National Classification of Activities	Young (0-14)	Potential labor force (15-64)				Pensioners (over 65)	Total
		Fixed-term contracts	Open-ended contracts	Full - time	Part-time		
Agriculture, hunting and forestry							
Fishing							
Minning and quarrying							
Manufacturing							
Electricity, gas and water supply							
Construction							
Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods							
Hotels and restaurants							
Transport, storage and communication							
Financial intermediation							
Real estate, renting and business activities							
Public administration and defense; compulsory social security							
Education							
Health and social work							
Other community, social and personal service activities							
Private households employing domestic staff and undifferentiated production activities of households for own use							

Extra-territorial organizations and bodies							
Social Benefits							
Unemployment subsidies							
Disability and sickness pay							
Social assistance							
Pensions							
Total							
Employment							
Social benefits							
Without income							
Population							

Table 2. Socio-demographic module in a SAM for the Republic of Macedonia

and qualitative changes of the potential labor force, as well as those changes influencing the consumption (ex.: the population age structure). This data can serve for the analysis of the impact of the demographic changes on the income distribution. A proposal for such socio-demographic module is presented in table 2. Republic of Macedonia, in our opinion, can use the socio-demographic module from the SESAME approach, by preparing several tables, using the international standards and classifications, as adopted and implemented by the State Statistical Office of the country (SNA 1993 and 2008, ESA 1995, etc.). The socio-demographic module can reveal numerous socio-economic trends existing in the Republic of Macedonia: population growth rates, average number of household members, the relation between the size of the household and its welfare, the urbanization processes, the process of decreasing size of the agricultural households, number of households depending on income transfers, the participation of women and men in the labor force, the labor force educational level, educational levels differences between the rich and the poor, etc. Hence, it is highly recommendable to use the SESAME approach in the process of macroeconomic and microeconomic policy creation and implementation in the Republic of Macedonia.

The State Statistical Office of the Republic of Macedonia, through its regular annual activities, provides substantial wealth of statistical data sets that can serve for analyzing the different aspects of the socio-economic development, as presented in the SESAME approach. These data include various characteristics and aspects of the population, health protection and social security, education, labor market, different types of revenues and expenditures, consumption and prices, etc. Moreover, substantial data are provided by the already prepared strategic documents in the Republic of Macedonia: National Poverty Reduction and Social Exclusion Strategy, National Sustainable Development Strategy, National Development Plan, etc.

As a conclusion, one must point out to the fact that the SESAME approach is a flexible approach, in which the number of satellite tables and the wealth of presented data will

depend on the goals of the research and the analysis of the development management processes in the Republic of Macedonia.

3.3 NAMEA for the Republic of Macedonia

Republic of Macedonia recognizes environmental protection and sustainable development as priorities both in their own right and as an essential part of the process leading to EU accession. Several important policy strategic documents in various environmental sectors have been adopted, defining the countries environmental policy. The existing strategic policy documents in the field of environment are the following: National Strategy for Environmental Approximation, Second National Environmental Action Plan 2006-2011, National Environmental Investment Strategy 2009-2013, Waste Management Strategy 2008-2020 and the National Waste Management Plan 2009-2015.

Other relevant framework strategies, important for the implementation of the above mentioned and tackling environmental performance of the industrial sector, are the following: National Strategy for Sustainable Development 2009-2030, Industrial Policy of Republic of Macedonia 2009-2020, Energy Efficiency Strategy until 2020, Strategy for use of renewable energy resources of Republic of Macedonia until 2020, National Strategy for development of small and medium sized enterprises 2002-2013, National Strategy on organic agricultural production 2008-2011, etc.

Environmental protection is one of the basic and priority values stated in the Constitution of the Republic of Macedonia. The establishment of the Ministry of environment and physical planning contributed to institutional capacity building of the country in the field of environmental policy creation and implementation. Moreover, the Republic of Macedonia follows the modern trends where Ministries of this type are one of the most important in the public administration system in the national economies.

All above mentioned imposes the necessity to implement the NAMEA approach in the country. In addition the above presented strategic documents in the field of environmental protection, the Ministry of environment and physical planning has established the **Macedonian Environmental Information Center**, as its organizational unit. The key functions of the Center are collecting, systematization, analysis, processing and presentation of data and information for the condition, quality and trends in the environment, as well as production of easy to understand and scientifically credible information on the environment. Such information is available to both decision-makers and the general public, thus contributing to enhanced awareness and improved decision-making process and ultimately making positive impact on the environment. As a result, the National Environmental Information System supports:

- the process of policy creation, planning and decision making;
- identifying effective measures for protecting and promoting the environment;
- on-time and reliable information for the public about the condition of the environment and active participation of the public in the environmental protection; and
- fulfillment of the requirements and the obligations for informing the national and international organizations and institutions.

Therefore, the development and coordination of unique national environmental information system is one of the key Center's priorities. It is an electronic system for environmental data collection and management. It provides optimized flow of data between relevant institutions and integration of all data into a single operational structure. Hence, environmental indicators, provided by this Centre, are useful tool in the process of environmental reporting. Properly selected indicators, based on properly selected time-series, show the key trends and enable rapid and appropriate intervention of all stakeholders involved in the process of environmental protection. Following the European Environmental Agency concept, the Government of the Republic of Macedonia adopted 40 environmental indicators, which follow the DPISR framework: **Driving forces – Pressures – State – Impact – Response**, where each phase has its own meaning and significance.⁹

Hence, the data base already created by the Macedonian Environmental Information Centre will be a solid foundation for the preparation and implementation of the NAMEA approach in the Republic of Macedonia. However, in order to be able to implement this approach in the Republic of Macedonia, one should apply additional methodological solutions in the separate national accounts, namely:

- the *production account*: to include data on the activities aimed at pollution reduction (ex.: solid waste management, etc.), i.e. data on expenses related to the activities for the pollution reduction undertaken by the separate production and institutional sectors in the national economy;
- the *production account*: to include data on the value of environmental taxes paid by the separate production and institutional sectors in the national economy, as well as the value of subsidies paid to the production and institutional sectors for the activities related to decreasing the air polluting gases;
- the *capital account*: to include data on the investments in so called “clean (environmental friendly) technologies”, undertaken by the separate production and institutional sectors in the national economy;
- in the *Social Accounting Matrix*: to include two additional columns and two additional rows:
 1. row/column for the most significant substances (environment polluters), which should record (in physical terms) the quantities of pollution created in the production and consumption processes in the national economy; and
 2. row/column for the natural resources, which should record data (in physical terms) on the natural resources' depletion, as a result of the production and consumption processes in the national economy.

Consequently, through such designed NAMEA approach for the Republic of Macedonia, one will connect data from the System of national accounts (SNA) and the environmental data in a systematic way (by applying uniform and standard definitions and classifications) and will enable to describe (in physical terms) the quantitative impact of the economic activities on the environment. Moreover, the NAMEA approach for the Republic of Macedonia will be a solid analytical database for preparation and

⁹ Ministry of Environment and Physical Planning of the Republic of Macedonia, www.moep.gov.mk

implementation of macroeconomic models for analyzing the environment protection policies and activities.

4. Conclusion

Sustainable development and sustainable development planning are complementary processes which should ultimately lead to increased well-being of the mankind. In order to better understand and implement the whole process, one should take into consideration their methodological basis, their preparation and implementation. Hence, first part of this chapter presented the theoretical foundations of the Social Accounting Matrix and its extension (SESAME and NAMEA), mainly through the work done by other authors. The second part of the paper gave practical recommendations which should, in our opinion, lead to preparation and implementation of the SAM and its extensions (SESAME and NAMEA) in the Republic of Macedonia, for the decision-making process related to creation and implementation of efficient macroeconomic and development policies in the country.

All abovementioned shows that development planning and the market are complementary mechanisms in the developed market economies, and as such should be equally the part of the new socio-economic system of the Republic of Macedonia. The successful combination of the „market's invisible hand“ and the „plan's visible hand“ will provide a more rational utilisation of the production factors and more dynamic economic development of the national economy. This will lead to a continuous improvement of the economic policy instruments, as well as the other types of planning and programming of the national economy development.

5. Acknowledgment

I dedicate this chapter to my parents, **Divna** and **Aleksandar**, for their continuous and unselfish support, understanding, sacrifice, guidance and unconditional love.

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**Sustainable Development - Policy and Urban Development -
Tourism, Life Science, Management and Environment**

Edited by Prof. Chaouki Ghenai

ISBN 978-953-51-0100-0

Hard cover, 478 pages

Publisher InTech

Published online 24, February, 2012

Published in print edition February, 2012

The technological advancement of our civilization has created a consumer society expanding faster than the planet's resources allow, with our resource and energy needs rising exponentially in the past century. Securing the future of the human race will require an improved understanding of the environment as well as of technological solutions, mindsets and behaviors in line with modes of development that the ecosphere of our planet can support. Sustainable development offers an approach that would be practical to fuse with the managerial strategies and assessment tools for policy and decision makers at the regional planning level.

How to reference

In order to correctly reference this scholarly work, feel free to copy and paste the following:

Sasho Kjosev (2012). Social Accounting Matrix – Methodological Basis for Sustainable Development Analysis, Sustainable Development - Policy and Urban Development - Tourism, Life Science, Management and Environment, Prof. Chaouki Ghenai (Ed.), ISBN: 978-953-51-0100-0, InTech, Available from: <http://www.intechopen.com/books/sustainable-development-policy-and-urban-development-tourism-life-science-management-and-environment/social-accounting-matrix-methodological-basis-for-sustainable-development-analysis>

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