# THE DPSEEA MODELS FOR SUSTAINABLE DEVELOPMENT ESTIMATION

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All main indicators of SD are associated with an objective to show the desirable direction in to move. Some of the objectives related to specific targets. Progress towards one objective may negatively influence on progress towards other. The balance between these should be received dynamically, and it may not be possible to set a specific target for each indicator.

A well-known example of a linkage-based framework model in SD is the Pressure-State-Response (PSR) which was developed by Statistics of Canada. Then the model was further improved and internationally accepted in many countries. The United Nations Commission on Sustainable Development (UNCSD) modified the PSR framework and called it Driving force-State-Response (DSR). The last has accompanied by a set of 134 Sustainable Development Indicators. The OECD has further changed the DSR framework and re-named as Driver-Pressure-State-Impact-Response (DPSIR) framework. The DPSIR framework has been used to structure the environmental information by most member states of the European Union and by many international organizations including the European Environmental Agency and EUROSTAT, the statistical office for the European Communities.

The World Health Organization took a wider look, relating impacts of macro driving forces and pressures on both health and the environment. The framework was called the Driving Force-Pressure-State-Exposure-Effect-Action (DPSEEA). The DPSEEA framework (Figure 1) is useful as it covers the full spectrum of cause and effect relationships starting from potential forces and required actions and brings together professionals, practitioners, and managers from both environmental and public health fields to help orient them in the larger scheme of the problem.

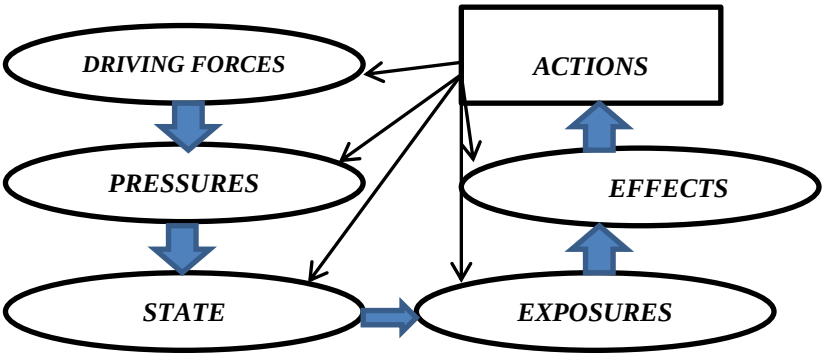


Figure 1. Modified DPSEEA Model

According to the Modified DPSEEA Model:

***DRIVING FORCES*** are numbers of key factors on the macro level influence the environmental processes and finally are resulted human health. For example, macroeconomic policies may have major effects on the environment and on people's health.

***PRESSURES.*** The various driving forces are resulted in form pressures on the environment: such as housing, heating, electricity production, energy, industry, recreation and so on. Many factors however, including policy context, social attitudes and economic infrastructure, affect the extent to which driving forces are translated into actual pressures on the environment. It should be underlined that pressures are generated by all sectors of economic activity.

***STATE.*** The quality of the environment is affected by the number of pressures exerted. Some changes may be complex and interrelated, affecting almost all spheres of the environment. Those are found in such effects as air pollution, marine pollution**,** global warming, while others may be more localized (for example, contamination of a local water supply).

***EXPOSURES*** are defined and measured, indirectly as the concentration of the pollutant in the environment (considering the duration of exposure, humans activity and initial health), as an estimate of the amount that an individual actually ingests, inhales or absorbs, or as the amount that actually reaches a target organ where a health effect may occur.

***HEALTH EFFECTS.*** Once a person has been exposed to an environmental hazard, health effects may manifest themselves which may vary in type, intensity and magnitude depending on the type of hazard, the level of exposure and other factors.

***ACTIONS.*** An approach to the control and prevention of health hazards which focuses on hazards of human origin is useful in that it addresses potentially remediable problems. This approach however must be adopted with due regard for

the still considerable uncertainty that exists about the extent of the direct and indirect risks to human health associated with specific agents in the environment or with the broader development process.

The DPSEEA framework has been widely used in the environmental health sector. This framework is very popular and easy in understanding beginning from drivers of environmental change (such as technology and population) to pressures (such as production, consumption and waste releases) to changes in environmental state (such as pollution levels) to exposure (such as external, internal and target organ doses) to effects on health, environment and overall sustainability. All sectors including public, private sector and individuals can take action to the outcomes at all levels, and this information can be used to provide feedback at all levels. In combination with multicriteria decision-making, this framework has a great potential to contribute significantly to sustainability analysis.

The main advantage of DPSEEA is its flexibility and applicability. Its usefulness depends on the context in which it is used, e.g., health in sustainable development planning.

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