THRESHOLD 21 STARTING FRAMEWORK
INTEGRATED DEVELOPMENT MODEL

Threshold 21 (T21) is a System Dynamics based model designed to support national development planning. T21 is structured to analyze medium-long term development issues at the national level. The model integrates in a single framework, the economic, the social, and the environmental aspects of development. Its comprehensiveness and level of aggregation make it ideally suited to support comprehensive analysis of different governmental strategies. T21 is conceived to complement budgetary models and other short-medium term planning tools by providing a comprehensive and long term perspective on development. Its absolute transparency enhances open and participatory policy debate.

The development of each national T21 model starts with the implementation of a Starting Framework, which is subsequently customized to capture the peculiar issues of the country being analyzed. The T21 Starting Framework is a generic structure that represents development mechanisms that can be found in most developing and industrialized countries. It covers a broad range of issues that countries the world over face on the path to sustainable development, for example, poverty, environmental degradation, education, healthcare, economic growth, and demographic shifts.

The T21 SF is a relatively large size model, comprising of more than a thousand equations, about 60 stock variables, and several thousands feedback loops. Given the size and the level of complexity of the model, its structure has been reorganized into smaller logical units, called *modules*.

The T21 SF is composed of 37 modules. A module is a piece of the T21 model whose internal mechanisms can be understood in isolation from the rest of the model. The size of a module is determined by based on consideration of the amount of information a user can take in at once, and the standard size of computer monitors. All modules fit in a 1024x768 screen.

T21's modules are grouped into 18 *sectors*: 6 social sectors, 6 economic sectors, and 6 environmental sectors. A sector is a group of one or more modules related by their functional scope. For example, the water sector groups the water demand and water supply modules; and the education sector groups the primary education and secondary education modules.

Society, Economy and Environment are known as the three *spheres* of T21. All sectors in the T21 SF belong to one of the three spheres, depending on the type of issue they are designed to address. Modules are built to be in continuous interaction with other modules in the same sector, across sectors, and across spheres.

Table 1 lists the modules of T21 SF and the sectors they belong to, for each of T21's spheres. The modules listed below are not normally sufficient to carry out a detailed country-specific analysis, such that in most cases additional modules have to be introduced to capture the particular reality of a country. Similarly, some modules may need to be eliminated during the customization process because they are not relevant to a country's peculiar situation. The T21 SF should thus not be considered a rigid framework, but rather a starting point for creating a fully customized national development planning model.

Examples of modules that are very often added to the initial structure

are the indicators modules. These are modules created to calculate or organize specific indicators, including but not limited to Millennium Development Goals (MDG), Human Development Index (HDI), and Gender Development Index (GDI). These and many others are ready, on-the-shelf modules to be linked to the Starting Framework as needed.

The structure of the individual modules is based on well accepted work in the field, "translated" in stock and flow language by MI modelers and integrated with ad-hoc research. A distinctive characteristic of T21 is the way the various modules are linked together to form a complex network of feedback loops that determine the model's behavior. Each of these feedback loops has a specific and often fundamental role in driving or limiting a country's development. It is essential for development to be fully sustainable that policy makers can identify the key forces at work in the system and alter their relative strength as desired. T21 is a guiding light for policymaking in these highly complex systems.

Table 1: Modules, Sectors and Spheres of the T21 Starting Framework

SOCIETY	ECONOMY	ENVIRONMENT
Population Sector:	**Production Sector:**	**Land Sector:**
1. Population	14. Aggregate Production and Income	30. Land
2. Fertility	15. Agriculture	**Water Sector:**
3. Mortality	16. Animal husbandry-fishery-forestry	31. Water demand
Education Sector:	17. Industry	32. Water supply
4. Primary Education	18. Services	**Energy Sector:**
5. Secondary Education	**Technology Sector:**	33. Energy demand
Health Sector:	19. Technology	34. Energy supply
6. Access to basic health care	**Households Sector:**	**Minerals Sector:**
7. HIV/AIDS	20. Households accounts	35. Fossil Fuel production
8. HIV children and orphans	**Government Sector:**	**Emissions Sector:**
9. Nutrition	21. Government revenue	36. Fossil Fuel and GHG emission
Infrastructure Sector:	22. Government expenditure	**Sustainability Sector:**
10. Roads	23. Public investment and consumption	37. Ecological footprint
Labor Sector:	24. Gov. balance and financing	
11. Employment	25. Government debt	
12. Labor Availability and Cost	**ROW Sector:**	
Poverty Sector:	26. International trade	
13. Income distribution	27. Balance of payments	
	Investment Sector:	
	28. Relative prices	
	29. Investment	