

A TECHNICAL INTRODUCTION TO

THRESHOLD 21

INTEGRATED DEVELOPMENT MODEL

What is T21?

Threshold 21 (T21) is a dynamic macroeconomic model designed to support comprehensive, integrated long-term development planning. T21's ability to include environmental and social factors in its analyses provides policy makers key insight into the potential impact of development policies across a wide range of sectors. Because it employs a System Dynamics approach, T21 reveals how different strategies interact with one another, allowing planners to create realistic and effective approaches to achieving their goals and objectives.

T21 is the result of more than 20 years of extensive research and application carried out in consultation with the World Bank, UN agencies, developing country governments, and non-governmental organizations.

How is T21 Different from RMSM-X and FPF Models?

T21 is based on an analysis of general development models and adaptation of the most respected sector models. T21 complements

and broadens the analyses carried out by Revised Minimum Standard Models (RMSM) and Financial Planning Framework (FPF) model. The following are some of T21's comparative advantage over RMSM-X and FPF models:

- T21 focuses on mid- to long-term planning, while RMSM-X and FPF focus on short- to mid-term;
- T21 integrates social and environmental factors in its macroeconomic framework, while RMSM-X and FPF models focus on economic and financial sectors;
- T21 is flexible and can be customized to capture the many different elements critical to a country's development (e.g. HIV/AIDS, oil price, mineral resources, and water availability);

- T21 replicates the fundamental assumptions underlying RMSM-X and FPF models and examines their impacts on the long-term development of a country.

T21 Starting Framework

The T21 Starting Framework provides a field-tested basis for country customizations. It includes three interconnected spheres that broadly reflect the structure and relationships of economic development. The figure below presents a conceptual overview of T21.

The three main spheres are: economy, society, and environment. Within each sphere are sectors that interact with each other and with sectors in the other spheres.

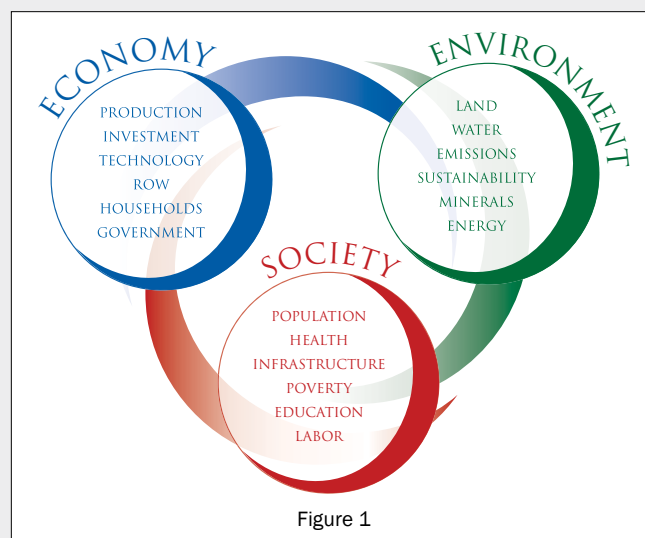


Figure 1

The **Economy** sphere contains major production sectors (agriculture, industry and services), which are characterized by Cobb-Douglas production functions with inputs of resources, labor, capital, and technology. Specific issues, such as the sugar industry, micro-credit, transportation, agricultural extension, livestock, and hydro power, are included production sub-sectors. A Social Accounting Matrix (SAM) is used to elaborate the economic flows and to balance supply and demand in each of the sectors. Demand is based on population and per capita income and distributed among sub-sectors using Engle's Curves.

This helps calculate relative prices, which are the basis for allocating investment among the sectors. The government sector generates taxes based on economic activity and allocates expenditures by major category. Public expenditure impacts on the overall economic performance and on the delivery of public services. Standard IMF budget categories are employed and key macro balances are incorporated into the model.

The Rest of the World sub-sector comprises trade, current account transactions, and capital flows (including debt management).

The **Social** sphere contains detailed population dynamics by sex and age cohort; health and education challenges and programs; basic infrastructure; employment; and poverty levels and income distribution. These sectors take into account, for example, the interactions of income, healthcare and adult

literacy rates on fertility and life expectancy, which in turn determine population growth. Population determines the labor force, which shapes employment. Education and health, together with other factors, influence labor productivity. Employment and labor productivity affect the level of production from a given capital stock. An HIV/AIDS sector is also included, which shows the possible evolution of infections, the impacts of the disease on population and productivity, and the effects of different treatment programs. Food sufficiency and nutrition, reproductive health, and vocational training are also addressed.

The **Environment** sphere tracks pollution created in the production processes and its impacts on health, and eventually on production. It also estimates the consumption of natural resources – both renewable and non-renewable – and can estimate the impact of the depletion of these resources on production and other factors. It also examines the effect of soil erosion and other forms of environmental degradation and their impact on other sectors, such as agricultural productivity and nutrition. Additional issues addressed are fossil fuel use, forest depletion, land and water degradation, air and water pollution, and greenhouse gas emissions.

What Can T21 Do?

The most important application of T21 is contributing to the national planning process. T21 is also

a valuable tool for conducting stakeholder consultations, producing strategy documents that address sectoral or industrial interests, producing data and analyses for loan negotiations, and monitoring and evaluating national plans. For these reasons, T21 is an especially tool for preparing Poverty Reduction Strategies (PRSs) which emphasize the Millennium Development Goals (MDGs) and for monitoring progress towards the MDGs or other national goals.

T21 Applications

T21 can be applied to most countries or regions. To date, more than 15 unique, customized T21 models have been developed.

AFRICA

Benin
Cape Verde
Egypt
Ghana
Malawi
Mali
Mozambique
Somalia (Somaliland)
Tunisia

AMERICAS

Guyana
St. Lucia
United States

EUROPE

Italy
Latvia

ASIA

Bangladesh
Bhutan
Cambodia
China
Indonesia (Papua)
Taiwan