Eastern Nile Irrigation and drainage Toolkit- Quick guide

Irrigation and drainage Toolkit

Scope of the tool

EN Irrigation and Drainage toolkit overall objectives are to provide solid and comprehensive profile information's, crop water requirement estimates and cropping patterns for all the EN irrigation schemes (existed and projected schemes). Furthermore, it aims is to assess the benefits that the investment could bring (Cost-Benefit and Multi Criteria Analysis) and present general irrigation design guidelines.

Information and knowledge resources are grouped by EN member countries, where subsections are organized into four major categories, namely;

- Irrigation Projects Profile
- Projected Irrigation Schemes Multi-Criteria Analysis
- Irrigation Schemes Crop Water Requirements & Cropping Patterns
- General Irrigation Design Guidelines

It is an excel file with macros and VB codes for the interface but it has very few data about actual irrigation schemes. It contains some guidelines international standards for the design of irrigation schemes.

Main functions and structure

The model is organized in four sections, as can be observed in the homepage of the toolkit.

Figure 75: Homepage of the Irrigation and drainage toolkit

Projected schemes multi criteria analysis

Figure 76: Homepage of the Projected schemes multi criteria analysis of the Irrigation and drainage Toolkit

This section provides the evaluation of different irrigation schemes in the Nile Basin, according to different criteria:

1. Farm Net Margin Benefit Criteria

The groups of irrigation schemes, divided into 5 groups, are evaluated and ranked according to the Farm Gross Margin Benefit due to the Project Introduction (With & Without). Commercial and Family evaluation is given.

2. Financial Criteria

   The irrigation projects, divided into Sudanese and Ethiopian projects, are evaluated and ranked according to the WFV= Weighted Financial Criteria (WFV= UIC + EPW + IRR + FGMB). Moreover is shown a ranking of the project using costs of infrastructure, water and field deducted from farm production benefits

3. Socio-Economic Criteria

   The irrigation projects, divided into Sudanese and Ethiopian projects, are evaluated and ranked according to Average Socio-economic values.

4. Environmental and Health Criteria

   The irrigation projects, divided into Sudanese and Ethiopian projects, are evaluated and ranked according to Average Environmental values.

5. Multicriteria Analysis

   The final sheet represents the Multicriteria ranking that combines all the criteria above mentioned.

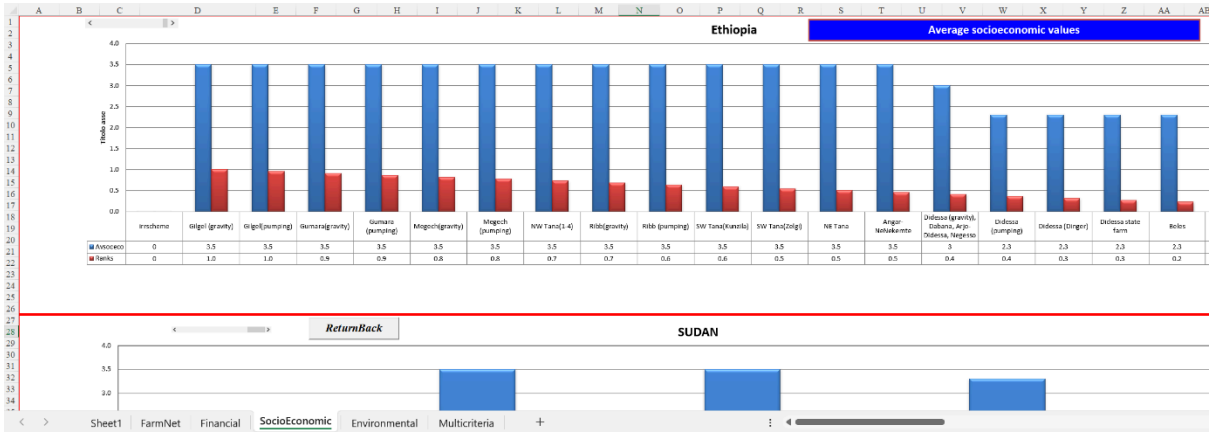

Figure 77: Multicriteria Analysis for the irrigation schemes of the Irrigation and drainage Toolkit

Irrigation projects profile sheets

Figure 78: Homepage of the Irrigation projects profile sheets of the Irrigation and drainage Toolkit

This section provides the irrigation projects profile sheets for three of the existing irrigation projects:

- Lower Egypt (Delta) irrigation project in Egypt
- Gumara irrigation project in Ethiopia
- Gezira Irrigation Scheme in Sudan

For these projects are provided

- General description of the irrigation project
- Location of the scheme
- Description of the physical environment, including Evapotranspiration and rainfall; Temperature; Soil and land use; Environmental aspects

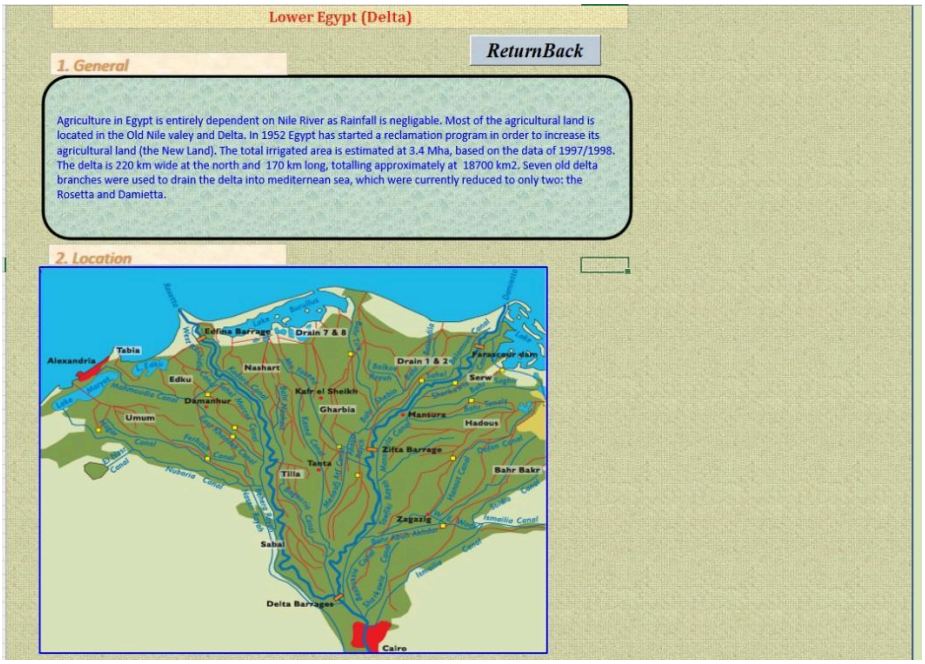

Figure 79: Irrigation Profile Sheets of an irrigation project of the Irrigation and drainage Toolkit

Irrigation schemes crop water requirements & cropping pattern

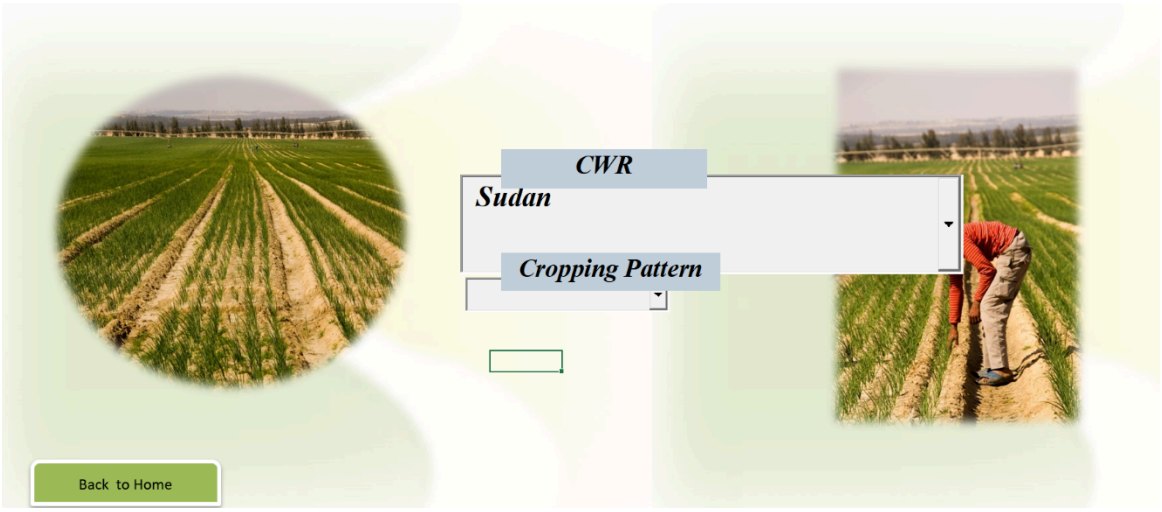

Figure 80: Homepage of the Irrigation schemes crop water requirements & cropping pattern of the Irrigation and drainage Toolkit

This section provides the crop water requirements of the irrigation schemes. They are divided by the countries Sudan, Ethiopia and Egypt. The water requirement is given for every month for each irrigation project.

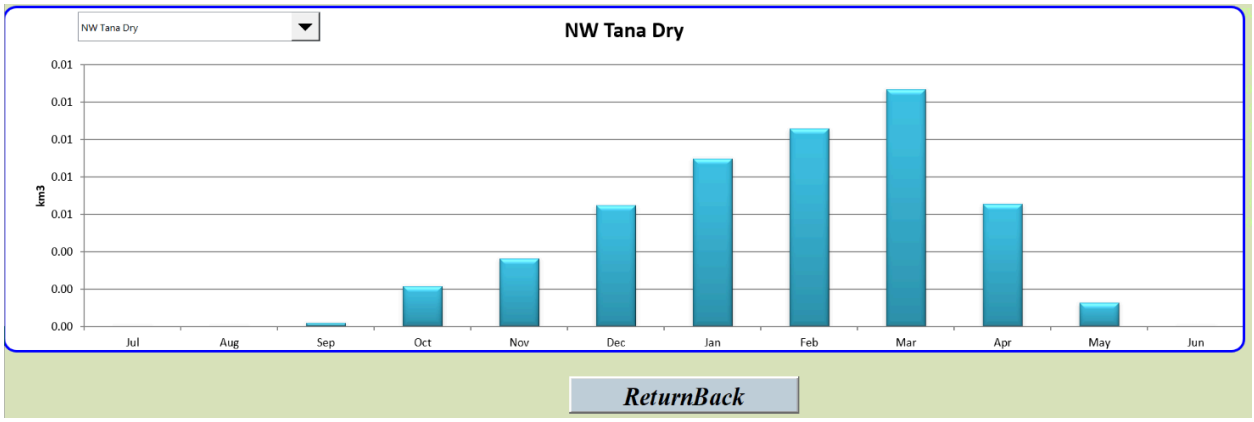

Figure 81: Water requirement for an irrigation scheme of the Irrigation and drainage Toolkit

Also the cropping patterns of the three countries are provided. The presence of the different crops are specified, with the indication of the cultivation period during the year.

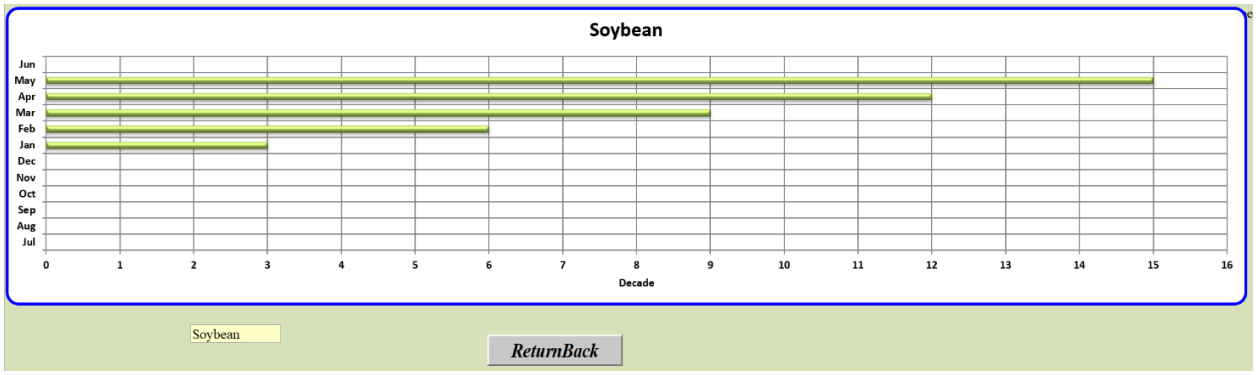

Figure 82: Cropping pattern for an irrigation scheme of the Irrigation and drainage Toolkit

Design sheets

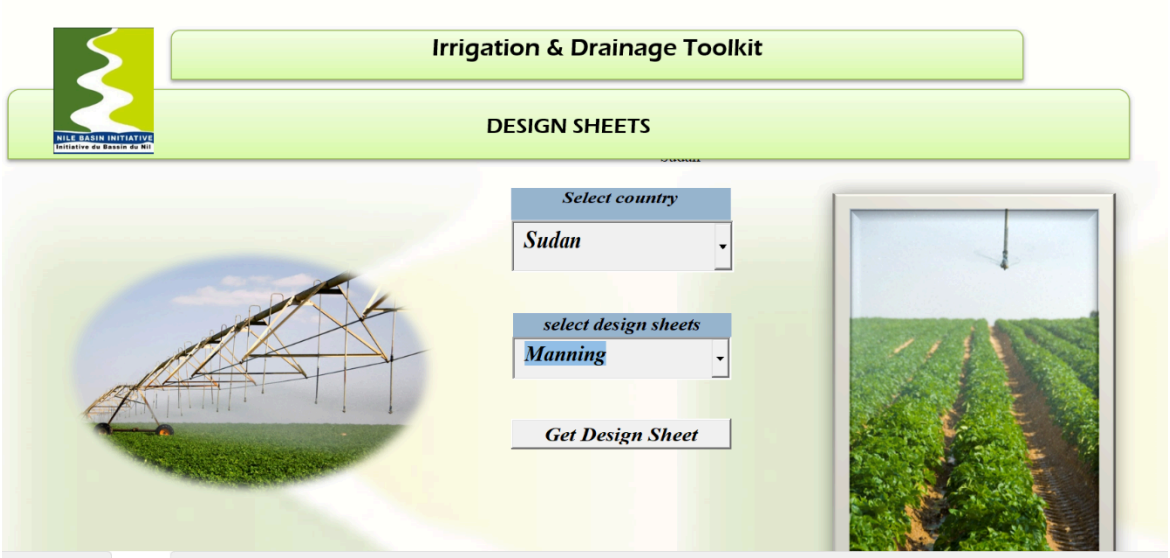

Figure 83: Homepage of the Design sheets of the Irrigation and drainage Toolkit

This section provides guidelines for the design of an irrigation project. Detailed explanations and drawings are presented, and that are divided among the following sheets:

- Guideline: provides a general design procedure for the irrigation projects
- Manning: is a Manning coefficient calculator based on a given slope
- Excavation: provides detailed data and calculation parameters for the excavation of canals
- Field sheets: provides details for pipe regulators, canal banks and sections
- Canal layout: provides parameters for the layout of a canalization
- Regulators: provides information for the regulator gauges
- Water duty: provides analysis on factors and water duty
- Design Ethiopia: gives detailed information about design of canals in Ethiopia
- Design Sudan: gives detailed information about design of canals in Sudan
- Design Egypt: gives detailed information about design of canals in Egypt

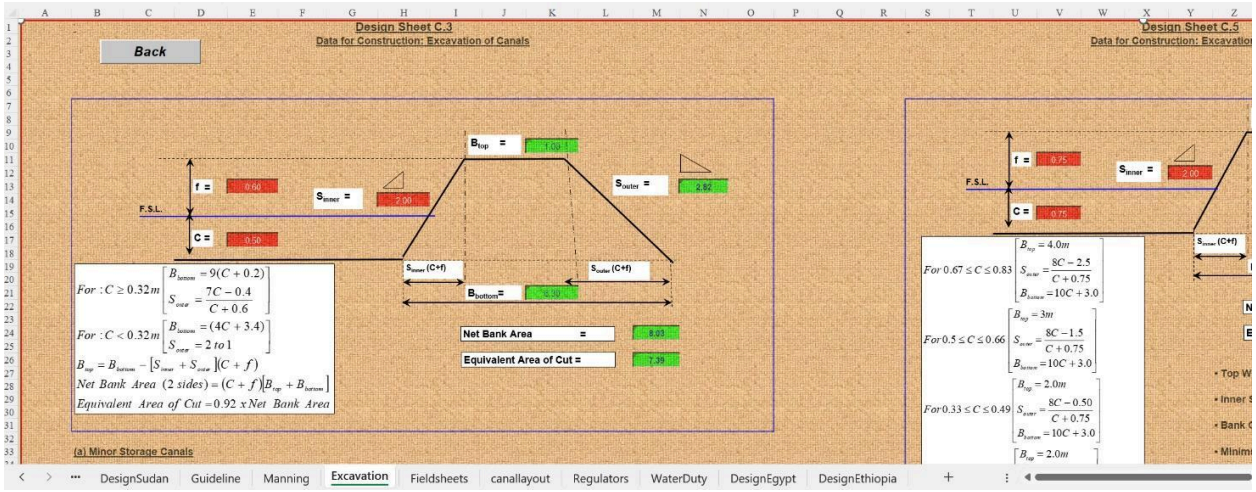

Figure 84: Design of the excavation of a canal of the Irrigation and drainage Toolkit