

SDMX Constructor: User Manual

International Labour Organization: Department of Statistics

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Preface

Welcome to the **SDMX Constructor User Manual!**

SDMX Constructor¹ is a powerful desktop software tool that helps users model aggregate data per the SDMX standards ². It eases generating and editing SDMX artefacts and ultimately supports data availability and access through SDMX-compliant data portals (such as ones built with .Stat Suite³).

SDMX Constructor is one of the tools that comprise the ILO SDMX toolkit ⁴, alongside SMART (Statistical Metadata-driven Analysis and Reporting Tool) and the SDMX Excel Add-in.

This user manual for the SDMX Constructor provides step-by-step instructions on using the tool in a user-friendly and accessible manner. It provides an in-depth understanding of SDMX Constructor's features and functionalities. It is an essential resource for anyone using the tool to manage and share data following the SDMX standards.

Below is a screenshot of the tool's landing page as an example of the user interface.

[Click here to enlarge the image](#)

¹It was previously called DSD Constructor, it supported creating and editing Data Structure Definitions (DSDs) and their related artefacts (i.e., concept schemes and code lists). The significant improvements and additions to the software justify the name change of the tool from DSD Constructor to SDMX Constructor. With the latest update, the tool can now translate SDMX artefacts in multiple languages, integrate with the .Stat Suite, and manage reference metadata. Additionally, the tool now includes Table Modeller functionalities that make it easier for users who are new to SDMX to understand and use the software. The updated software is no longer just a DSD Constructor but a complete SDMX Constructor capable of handling various aspects of SDMX data and metadata. The new name better reflects the software's expanded capabilities, making it more relevant and recognizable to the target audience (<https://ilostat.github.io/dsdc/>).

²An ISO standard (since 2005, version 2.1 since 2013): <https://www.iso.org/obp/ui/fr/#iso:std:iso:17369:ed-1:v1:en> and https://sdmx.org/?page_id=5008

³To learn more about the .Stat Suite platform please refer to the documentation here: <https://siscc.org/stat-suite/>. The SDMX Constructor has been optimised to seamlessly integrate with the .Stat Suite platform, as its back-end client.

⁴<https://ilostat.ilostat.org/resources/sdmx-tools/>

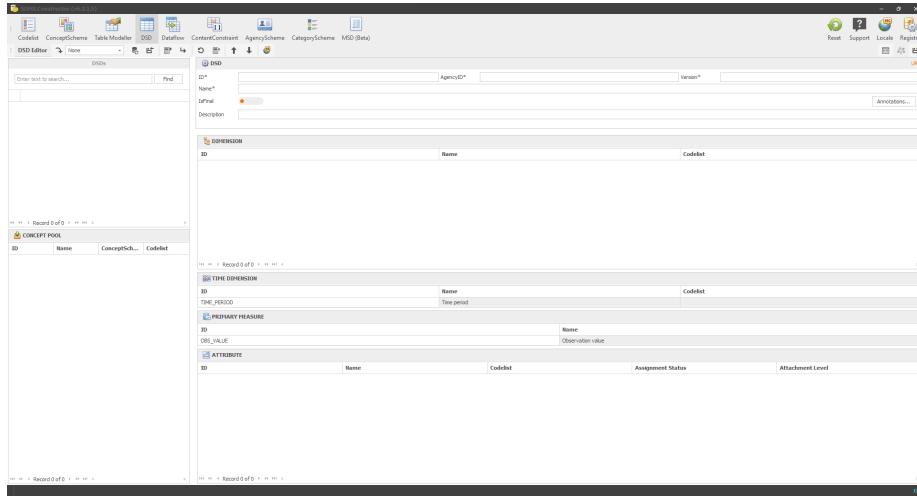


Figure 1: A screenshot of SDMX Constructor

Audience and use cases

The SDMX Constructor is designed to meet the needs of a wide range of users, from beginners who are new to SDMX to data managers who need advanced capabilities for managing large and complex datasets. In addition to these user types, there may be other groups of users with specific requirements or use cases. This user manual provides guidance and instructions for using the SDMX Constructor, focusing on the needs of these various user types.

SDMX beginners: These users are new to SDMX and want to use the SDMX Constructor to view, edit, and create new SDMX structural artefacts. They may need assistance understanding the SDMX concepts, terminology, and the software's user interface.

For SDMX beginners, this manual explains using the SDMX Constructor to access, view, edit, and create SDMX structural artefacts from SDMX registries. While one can find information on SDMX concepts and terminology from other sources, this manual focuses explicitly on the user interfaces of the SDMX Constructor. The SDMX beginners may be keen to know how to access SDMX artefacts from default SDMX registries and connect to a new SDMX registry from the SDMX Constructor.

Data managers: These users are likely familiar with the SDMX concepts and terminology and may require information about advanced functionalities offered by the SDMX Constructor. For example, they may want to use the SDMX Constructor as a backend client to manage SDMX artefacts for the .Stat Data Lifecycle Manager (DLM). For such cases, they may also use the SDMX Constructor to build the initial structural metadata when creating a new .Stat

Suite instance.

There are several topics that data managers may be interested in learning when it comes to creating SDMX artefacts from scratch. Firstly, they may want to start by setting up a registry as a local folder. Next, they can prepare inputs and create several artefacts, including the AgencyScheme, ConceptScheme, and Codelist and the DSD, Dataflow, ContentConstraint, and CategoryScheme. After creating these artefacts, they may want to learn how to upload the XML file to the Data Lifecycle Manager (DLM). Additionally, they may want to know how to access SDMX artefacts from default SDMX registries and connect to a new SDMX registry for editing SDMX artefacts directly in the DLM.

SDMX metadata managers: These users manage SDMX artefacts and ensure their accuracy and consistency. They may use the SDMX Constructor to model data and modify SDMX structural artefacts, including translating SDMX artefacts in various languages, managing annotations and creating Metadata Structure Definition (MSD).

Scope and assumptions

This comprehensive manual provides a step-by-step guide on getting started with the software, including installing it and creating and managing SDMX artefacts. The manual includes a detailed overview of the tool's user interfaces, including menu items, navigation, and other essential features. The manual does not, however, delve into the intricacies of the SDMX standard itself. Describing the SDMX standard is beyond the scope of this manual, as it is an extensive and complex topic requiring more in-depth discussion and is available elsewhere. Instead, the manual assumes that readers are familiar with the SDMX standard and focuses on explaining how to use the tool within that context.

Overview

The chapters in this manual build up toward providing comprehensive guidance that covers topics users need to know to get started with the application, understand its navigation, and use its features and functionalities to model data effectively. The manual includes the following chapters.

- Chapter 1: Benefits of SDMX Constructor
- Chapter 2: Getting started
- Chapter 3: User interface
- Chapter 4: Using SDMX Constructor
- Chapter 5: Special Topics
- Chapter 6: Glossary

Contact information

For more information and to seek basic technical assistance or support on the tool, please reach out International Labour Organization - Department of Statistics at sdmx.support@ilo.org.

Chapter 1

Benefits of SDMX Constructor

SDMX Constructor is a software tool that offers a range of features and functionalities designed to streamline and optimise the SDMX workflow, making it an essential tool for statistical organisations, data providers, and other stakeholders involved in the production and dissemination of statistical data.

One of the key benefits of SDMX Constructor is that it allows users to access and query SDMX structural artefacts from publicly available SDMX registries (through APIs in the background) in a desktop environment. This makes it easy for users to quickly and easily search for and view essential components of SDMX structural metadata, such as Data Structure Definitions (DSDs) and dataflows.

In addition to its API capabilities, SDMX Constructor offers two other essential features. The first is that it helps users model data following the SDMX standards. For example, SDMX Constructor makes it easy for users to define data structures and create data flows following SDMX standards. This is essential for data providers who need easy-to-use tools to ensure that their data can be shared and used by others in a consistent and standardised way.

The second essential feature of SDMX Constructor is that it enables users to create and edit SDMX artefacts in a user-friendly environment. This includes creating and editing code lists, concept schemes, DSDs, dataflows, content constraints, category schemes and Metadata Structure Definitions (MSDs). SDMX Constructor provides a user-friendly interface that makes it easy for users to create and modify these artefacts without needing to be an expert in SDMX.

Finally, SDMX Constructor supports data availability and access through online data portals. Using SDMX Constructor, data providers can ensure their data is available and accessible through online data portals built on SDMX standards.

This allows data users to easily access and use the data they need for their research, analysis, and other activities.

Chapter 2

Getting Started

In this chapter, you will find information about the installation process of SDMX Constructor in a Windows environment. Specifically, it will cover the system requirements necessary to install the software, the steps required to download the executable file and the subsequent installation process. The chapter will also explain the software update process, providing practical guidance on keeping your SDMX Constructor current.

2.1 System requirements

Before installing any desktop software, ensuring the computer meets the necessary system requirements is essential. These requirements can include hardware specifications like processor speed, memory, and storage capacity, as well as software prerequisites like operating system version and other dependencies. Find below the minimum system requirements for installing and running SDMX Constructor.

- Windows 7 or later in both 32- and 64-bit environments
- .NET 4.5.2 or later with all updates and patches
- 200MB disk space for the software

2.2 Installation

Step 1: Visit the site <https://ilostat.github.io/dsdc/> and click on the INSTALL menu option (as shown below).



Step 2: In the resulting page, click on “here” (as shown below)

➤ Installing

[Click here to download and install the DSD Constructor](#)

Step 3: An interface (as shown below) will open, requiring you to enter a few details (your name, your email, and the name of your organisation (if applicable)).

In order to use the data tools from ILOSTAT, please fill in the fields below

Name	<input type="text"/>
Email	<input type="text"/> We will confirm your download so this email should be working
Organization	<input type="text"/> Name of your organization
<input type="button" value="Submit"/>	

Step 4: The download will start when you fill in the form and submit the information. The software installer file, named “ILOSTAT_DSD_Constructor_Setup.exe”, will be downloaded.

Step 5: Double-click on this file to begin the installation process. Select ‘Install’ on the security message and wait for the installation process to complete.

2.3 Software updates

The SDMX Constructor updates itself to the latest version (if available) using the ClickOnce Deployment technique. This method ensures a streamlined installation process with minimal user involvement. An internet connection is required when launching the application to initiate the update. The software will check for available updates and automatically download and install them in the background without requiring any input from the user. This feature helps to ensure that users always have access to the latest version of the software, with the latest bug fixes, performance improvements, and new features.

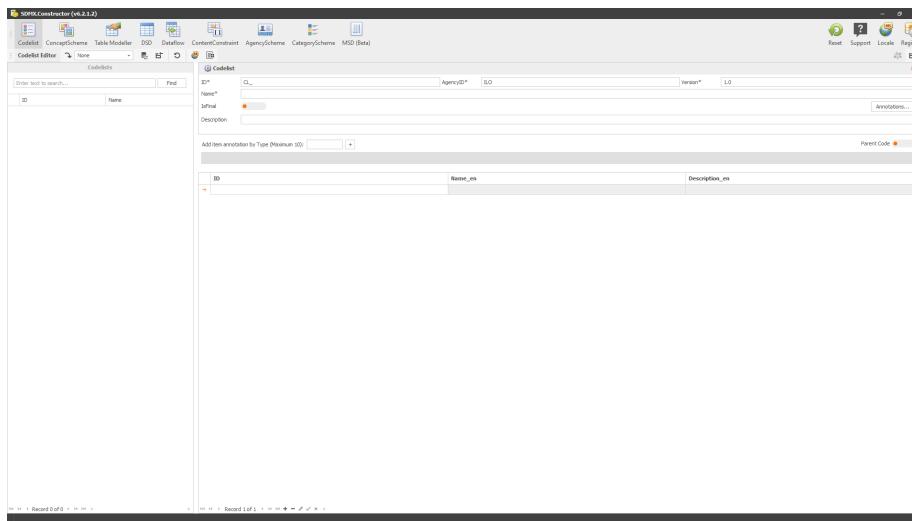
Chapter 3

User Interface

This chapter will provide you with a comprehensive guide on the main aspects of the SDMX Constructor's user interface. It will cover three main topics. The first topic will be an overview of the user interface, including a detailed explanation of the various menu options, toolbars, and navigation options. The second topic will focus on the inputs and outputs of SDMX Constructor. It will cover the different input options available and the output options. The third topic will provide an overview of the translation functionality in SDMX Constructor.

3.1 Interface overview and navigation

The user interface of the tool appears like this:

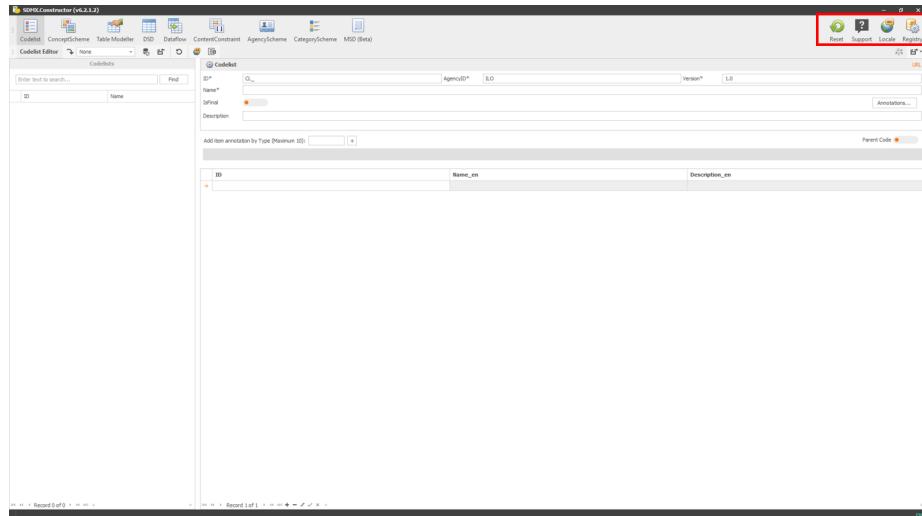


[Click here to enlarge the image](#)

It is designed to be intuitive and user-friendly. It consists of a main window or working area and menus on top that contains various menu items. The menu items are categorised into General Functions, Editors, Editor Ribbon and Preview and Export.

3.1.1 General Functions Menu

In the top right corner (as highlighted below), the first group of buttons (General Functions) shows the items applicable to the whole tool. They include Reset, Support, Locale and Registry. See Table 3.1 for a brief overview of the menu items.



[Click here to enlarge the image](#)

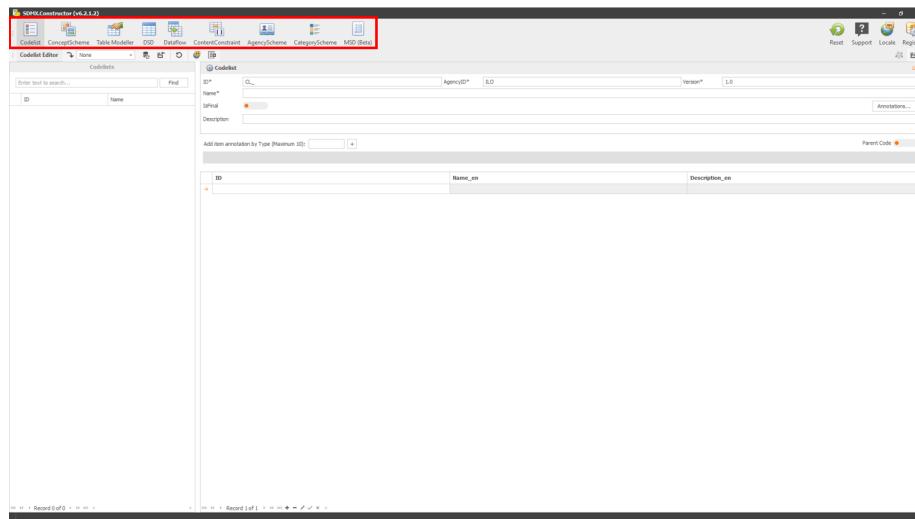
Table 3.1: A bird's-eye view of the menu items in the top right corner (General Functions)

Menu item	What to expect: A bird's-eye view of General Functions
Reset	The Reset button resets the tool to its default settings. It removes all the inputs and initiates a fresh start.

Menu item	What to expect: A bird's-eye view of General Functions
Support	The Support button launches the default email application on a computer, with a new email message addressed to the support team for the tool, ready to be composed and sent.
Locale	The Support button launches the default email application on a computer, with a new email message addressed to the support team for the tool, ready to be composed and sent.
Registry	The Registry button provides several options for users to configure their settings. For example, users can specify the connection details of the SDMX registry (either a local folder or local instance (localhost) or online) and connect with the Data Lifecycle Manager (DLM) component of the .Stat Suite. In addition, the button allows specifying the proxy settings for the internet connection if a proxy is needed. There are also options for entering authentication credentials for automated translation using Google Translation or DeepL API.

3.1.2 Editors Menu

The second group of menu items (Editors) shows the options in the top left corner (as highlighted below). They include Codelist, ConceptScheme, Table Modeller, DSD, Dataflow, ConceptConstraint, AgencyScheme, CategoryScheme and MSD. Each menu item is an entry point for creating and editing a specific artefact. Clicking on any of the options will reveal more particular options below. See Table 3.2 for a brief overview of the menu items (Editors).



[Click here to enlarge the image](#)

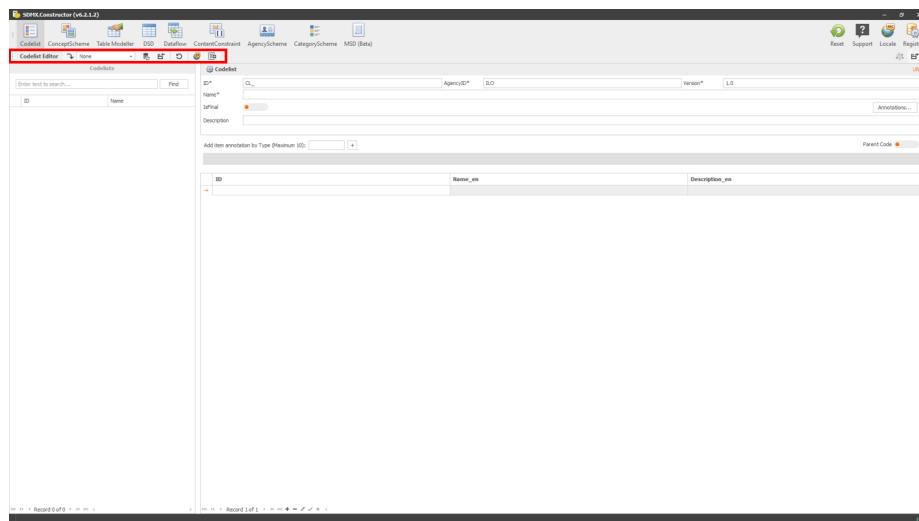
Table 3.2: A bird's-eye view of the menu items in the top left corner (Editors)

Menu item	What to expect: A bird's-eye view of the menu items in the top left corner (Editors)
CodeList	The CodeList button shows an interface to create or edit the list of Concepts (dimensions/attributes of a modelled dataset), each having a list of possible values or codes. The codes have unique IDs and (multilingual) labels and may have other information such as order and hierarchy.
ConceptScheme	The ConceptScheme button shows an interface to create or edit the Concepts (dimensions/attributes of a modelled dataset). Each concept has an ID and (multilingual) labels and may have other information.
Table Modeller	The Table Modeller button shows the options to generate the SDMX artefacts by recreating the statistical table using the Concepts (dimensions/attributes of a modelled data set) with an intuitive user interface (drag and drop).
DSD	The DSD button abbreviating Data Structure Definition shows an interface to create or edit the structure of a modelled dataset. It specifies the dimensions, attributes and their possible values or codes.

Menu item	What to expect: A bird's-eye view of the menu items in the top left corner (Editors)
Dataflow	The Dataflow button shows an interface to create or edit a subset and representation of a DSD and describes which dimensions to show on rows or columns.
ConceptConstraint	The ConceptConstraint button shows an interface to create or edit combinations of codes that are allowed for various artefacts of the dataflows.
AgencyScheme	The AgencyScheme button shows an interface to create or edit a hierarchical list of agencies or organisations. Each agency or organisation is identified by a unique code (ID), a name, and other descriptive information.
CategoryScheme	The CategoryScheme button shows an interface to create or edit a CategoryScheme, which is essentially a list of categories organised in a hierarchical structure. Each category is identified by a unique code (ID), a name, and other descriptive information.
MSD	The MSD button abbreviating Metadata Structure Definition shows an interface describing the structure of reference metadata associated with a data set. It specifies the elements and attributes that can be used to represent metadata concepts and the relationships between them.

3.1.3 Editor Ribbon Menu

The third group of menu items (Editor Ribbon) are in the top left corner and below the second group of menu items (as highlighted below).



[Click here to enlarge the image](#)

It contains icons that represent the most commonly used features of the selected options above, and hovering over each icon will reveal a tooltip that describes its function. The options available in this group of menu items change according to the menu item selected on the top menu.

Below are the icons representing the menu items (Editor Ribbon) and their functions. Users can change the size of these icons by right-clicking on any of them, selecting Customize, and selecting the appropriate setting in Options.

Table 3.3: A bird's-eye view of the menu items in the Editor Ribbon

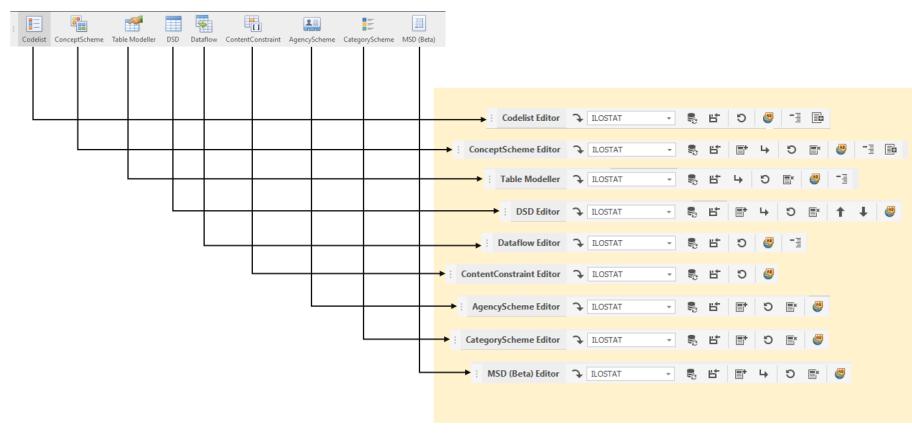
Menu item	Names and functions
	Load from Registry. Select from a dropdown list to load.
	Refresh the registry.
	Import. Allows to import an SDMX XML file locally.
	Reset the current Editor inputs.
	Translation Service. Provide inline translations for names and descriptions via translation API or manually if needed.
	Collapse DSDs.

Menu item	Names and functions
	Bulk load. Allows to upload multiple items (if available) by copying and pasting.
	Add New Concept (e.g., Agency or Category). Depending on which Editor is active, e.g., it can help add a new agency if it is for AgencyScheme.
	Load Concept.
	Delete Selected Concepts.
	Move Up.
	Move Down.

If a user chooses “Codelist” from the top menu, the corresponding menu items in the third group will appear as “Load from registry” (from the dropdown menu), “Refresh the registry”, “Import”, “Reset the current Editor inputs”, “Translation Service”, and “Bulk load”.

However, suppose a user selects “ConceptScheme” from the top menu instead. In that case, the user will see three additional options: “Add New Concept”, “Load Concept”, and “Delete Selected Concepts” relevant to the chosen menu item at the top, i.e., “ConceptScheme”.

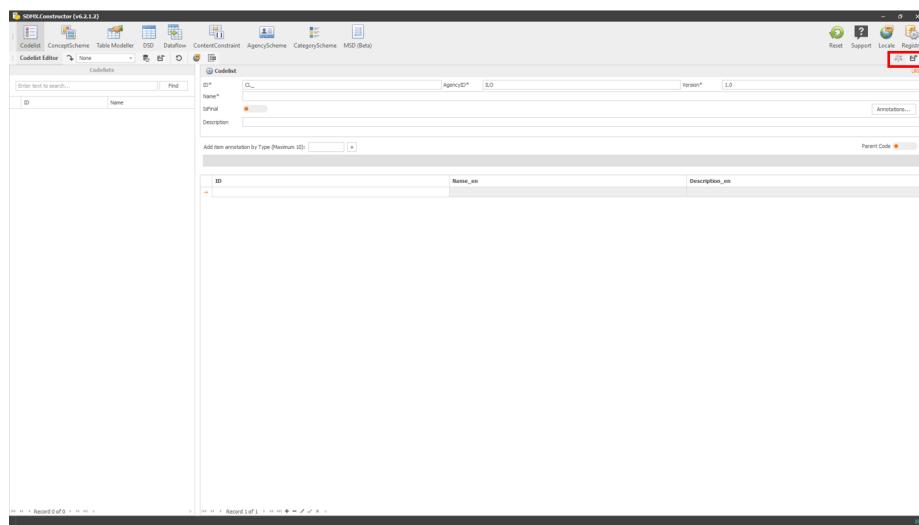
All options available within this menu group per the item selected on the top menu are listed below.



[Click here to enlarge the image](#)

3.1.4 Preview and Export Menu

The fourth menu item group (Preview and Export) is in the top right corner and below the first group of menu items (as highlighted below).



[Click here to enlarge the image](#)

The options available in this group of menu items are related to the preview and export functionalities of the tool and change according to the menu item selected on the top menu (the second group of menu items (Editors)).

Below are the icons representing the menu items, along with their features. Users can change the size of these icons by right-clicking on any of them, selecting Customize, and selecting the appropriate setting in Options.

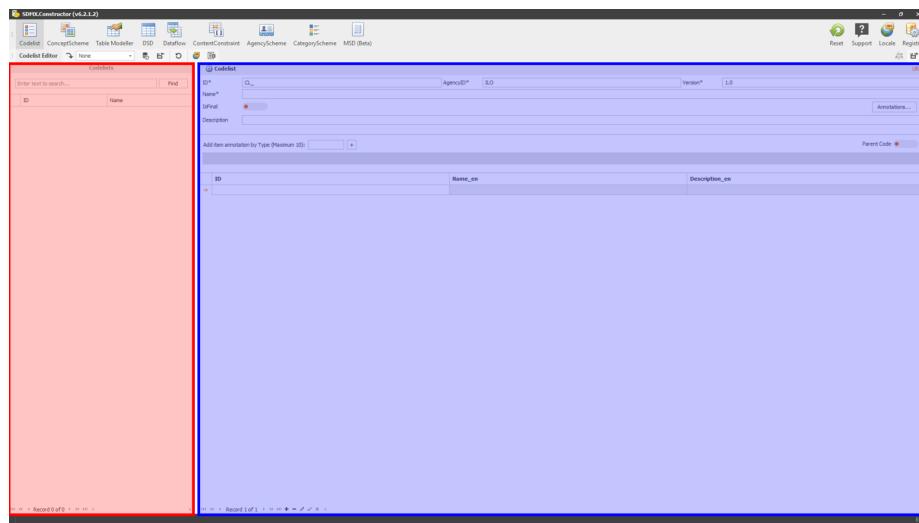
Table 3.4: A bird's-eye view of the menu items in the Editor Ribbon

Menu item	Names and functions
	Export. It saves the SDMX artefact in a local folder. It is available for DSD, Dataflow, ContentConstraint, AgencyScheme, and MSD without specific options. However, options are available to save artefacts from: 1. Codelist (available in the following formats: .Stat v7 Dim, CSV and SDMX-ML) and 2. ConceptScheme, Table Modeller and CategoryScheme (available in two flavours: Save with descendants and Save without descendants).
 or 	Push to DLM (DLM is short for Data Lifecycle Manager of the .Stat Suite). This icon becomes active (appears with colours) when the tool is connected with a DLM instance. It is available for Codelist, DSD, Dataflow, ContentConstraint, AgencyScheme, and MSD without specific options. However, options are available to save artefacts from ConceptScheme, Table Modeller and CategoryScheme.
	Structure Viewer. It lets you preview the tabulation and download the MS Excel and CSV templates. It is available for DSD and Dataflow.

3.1.5 Working area

The following section explains the working area of the tool.

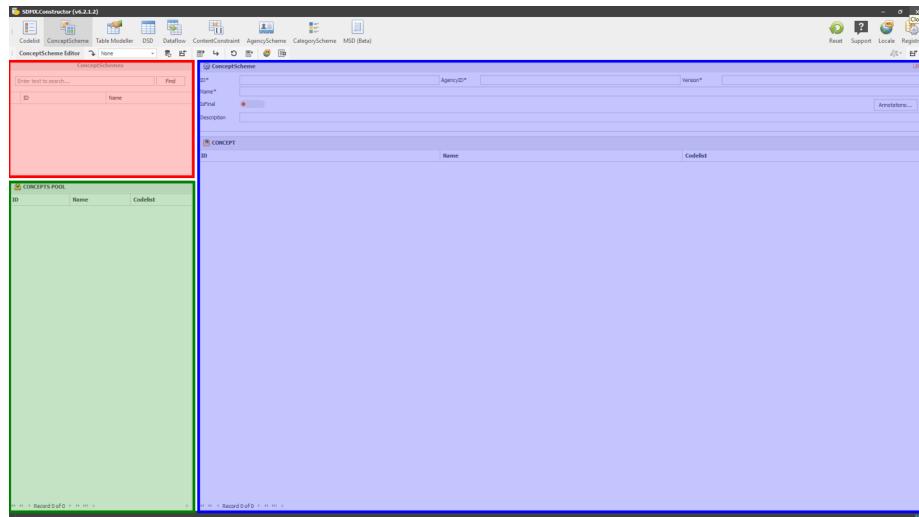
Below the menu items on top, the user interface appears divided into two main parts. First, the left pane on the interface serves as a space to hold the artefacts' list. The other side is designated to showcase relevant details (both sides are highlighted in different colours in the screenshot below). Selecting (by double-clicking) an artefact from the left pane prompts its details to appear on the screen's right-side pane. This layout is available for Codelist, Dataflow and ContentConstraint.



[Click here to enlarge the image](#)

For ConceptScheme, Table Modeller, DSD, AgencyScheme, CategoryScheme, and MSD, an additional pane also appears in the user interface (below the placeholder for listing the artefacts - (as highlighted below)), which acts as a staging area (or a pool). It becomes a CONCEPTS POOL for ConceptScheme, Table Modeller, DSD and MSD options. And it turns into an AGENCY POOL for AgencyScheme and a CATEGORY POOL for CategoryScheme options.

The users can drag the artefacts back and forth between the pool area and the pane on the right.



Click here to enlarge the image

3.2 Input and output methods

Users can input information into SDMX Constructor in several ways, depending on the specific scenarios. The following are the options.

- Typing and copy-pasting: Users can enter information by typing text or copying and pasting into fields in the forms using a keyboard.
- Clicking: Users can interact with buttons, links, menus, or other graphical elements by clicking with a mouse, touchpad, or touchscreen. For example, double-clicking an artefact from the left pane load its details on the screen's right-side pane.
- Dragging and dropping: Users can manipulate objects or select multiple items by dragging and dropping them with a mouse, touchpad, or touchscreen.
- Loading from online SDMX Registry: Users can access pre-prepared SDMX artefacts from many default online SDMX registries. The input method allows users to retrieve information from the SDMX registry.

SDMX Constructor presents information to users in a standardised and user-friendly way, using a combination of graphical elements, form-based input and validation and error messages.

- Graphical interface: The DSD Constructor uses a graphical user interface (GUI) that allows users to interact with the metadata components using visual elements like buttons, menus, and icons. This makes it easy for users to navigate and manipulate the metadata and get a quick overview of the SDMX artefacts.
- Form-based input: The DSD Constructor uses form-based input screens to allow users to enter information about the metadata components. The forms are designed to be intuitive and easy to use, with clear labels, drop-down menus, and text boxes that guide users through the input process.
- Validation and error messages: The DSD Constructor validates the metadata components to ensure that they conform to the SDMX standard and are consistent with other components. If there are errors or inconsistencies, the tool provides error messages that help users identify and correct the issues.

3.3 Translation

DSD Constructor allows users to manage multilingual metadata components easily. Users can choose from automatic or manual translation methods and

edit translations using translation tables. The tool simplifies the translation process with standardised language codes and automation and helps users achieve accurate, high-quality translations.

Here are some ways the tool can support the translation of SDMX artefacts:

- Translation into three languages: The tool supports translating content into three languages of your choice. It helps by following two automatic methods, but you can always do it manually if required.
- Automatic translation methods: Using the Google Translate API key, you can connect with Google's translation services. Another automated way is using DeepL. The SDMX Constructor allows programmatic access to DeepL's machine translation technology, bringing high-quality translation capabilities directly to the tool.
- Translation tables: Using these API keys, the SDMX Constructor provides translation tables, which allow users to edit suggested translations of metadata components in different languages. You can enter translations for different language codes, and the tool will automatically populate the translations in the appropriate fields.
- Standardised language codes: The SDMX Constructor uses standardised language codes; users can select from a list of pre-defined language codes.

Chapter 4

Using SDMX Constructor

Welcome to the chapter on using SDMX Constructor! This chapter will cover three key topics that will help you make the most of this powerful tool.

The first topic we will cover is how to use SDMX Constructor to access SDMX artefacts from SDMX registries. This will include step-by-step instructions on how to use the tool to connect to a registry, browse its contents, and download the artefacts you need.

Next, we will dive into how to use SDMX Constructor to create new SDMX artefacts from scratch. Whether you need to create a new concept scheme, code list or DSD, SDMX Constructor provides a simple and intuitive interface to help you get the job done.

Finally, we will explore how to use SDMX Constructor to work with .Stat Suite. This powerful platform is designed to help you analyse, visualise, and disseminate statistical data, and SDMX Constructor is the perfect complement to help you access and work with the SDMX artefacts you need.

By the end of this chapter, you will have a solid understanding of how to use SDMX Constructor to access, create, and work with SDMX artefacts, and you will be well on your way to becoming an expert in this powerful tool. So, let's get started!

4.1 Accessing SDMX artefacts from registries

In this section, we will walk you through the process of using SDMX Constructor on your computer to access and view the SDMX artefacts from the SDMX registries. This will enable you to easily browse and download the artefacts you need, for example, from the default registries already available in the SDMX Constructor.

Default SDMX registries

You can use the SDMX Constructor on your computer to access and view the SDMX artefacts from the SDMX registries. By default, SDMX Constructor offers the following registries to access SDMX artefacts: SDMX Global Registry: (<https://registry.sdmx.org/>), United Nations Statistics Division (UNSD): (<https://data.un.org/WS>), the Italian National Institute of Statistics (ESTAT) and the ILO Department of Statistics (ILOSTAT): (<https://www.ilo.org/sdmx/index.html>). You can view these by going to the Registry button and opening the Registry Name dropdown in the SDMX Registry tab, as shown below.



Click here to enlarge the image

As shown below, select a registry from the dropdown option to load the artefacts.

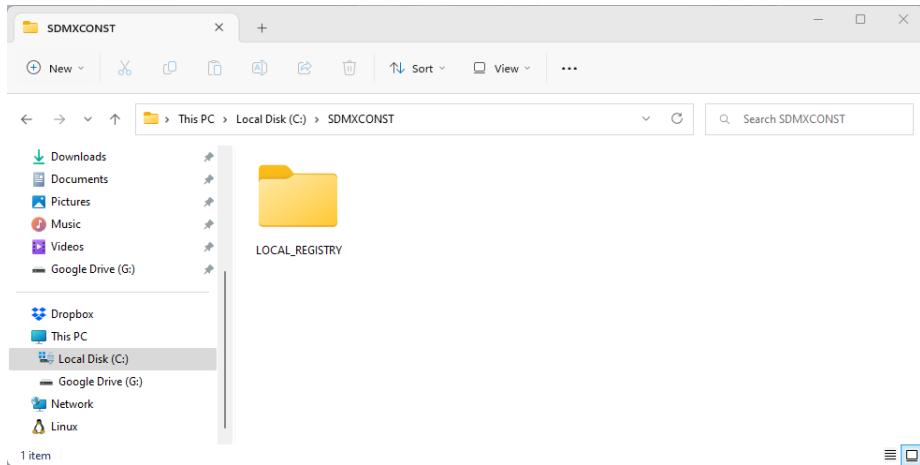


Click here to enlarge the image

4.2 Setting up a registry as a local folder

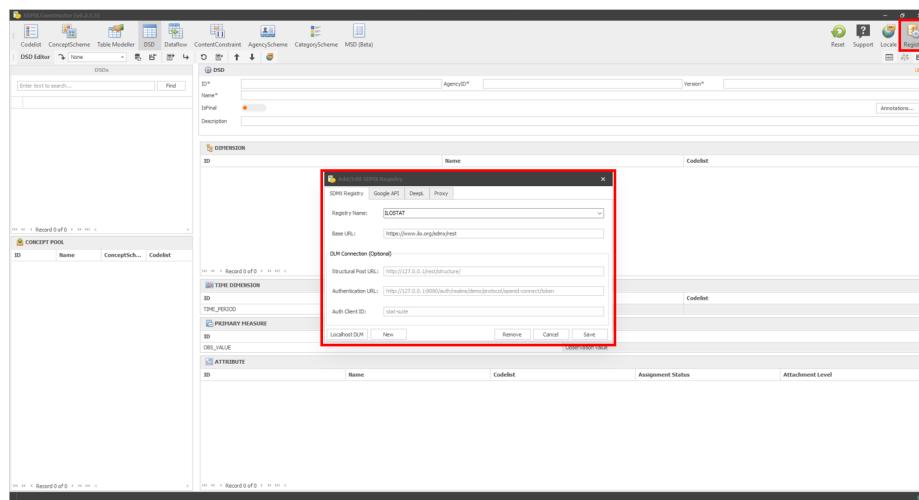
You can use the SDMX Constructor to create SDMX artefacts on your computer without a complicated setup. You can start using it with a local folder on your computer. Following are the steps to set up a registry in a computer's local folder.

- On your computer, create a folder, and let's call it LOCAL_REGISTRY. The screenshot below shows that the folder is created within the C drive.



Click here to enlarge the image

- Start the SDMX Constructor.
- Click on the Registry button on the SDMX Constructor. It will open a pop-up window showing the default entries in the SDMX Registry tab.



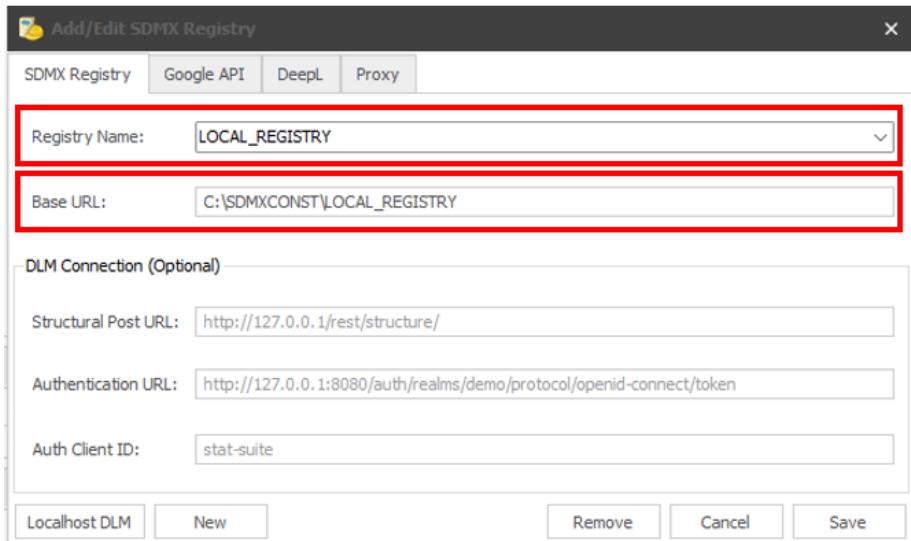
Click here to enlarge the image

- In the pop-up window, there are only two fields where we need to make changes: Registry Name and Base URL. You can click the ‘New’ button (which will clear the fields) or type directly within the fields.
- For Registry Name, please type the name of the folder we created before LOCAL_REGISTRY.
- For the Base URL, get the path of the folder (shown below).



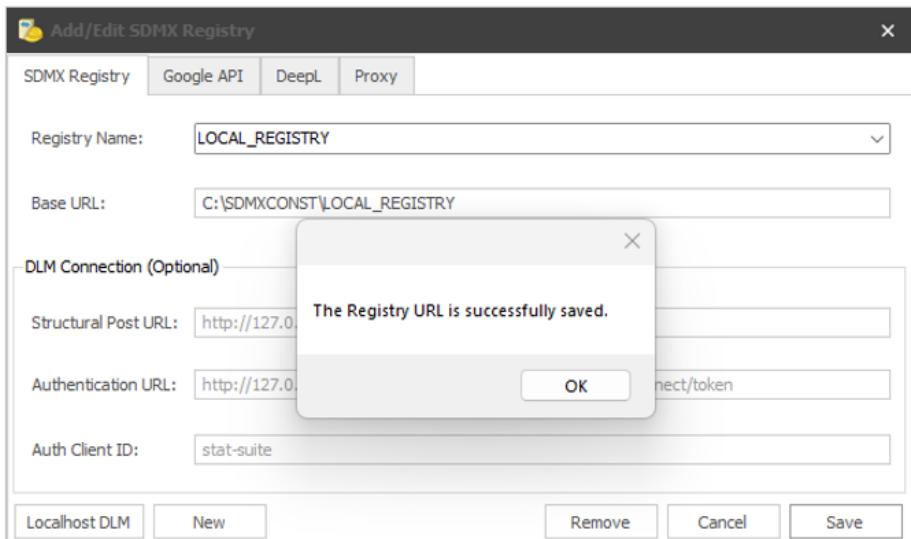
Click here to enlarge the image

- After entries in two fields, the pop-up window will look like this:



Click here to enlarge the image

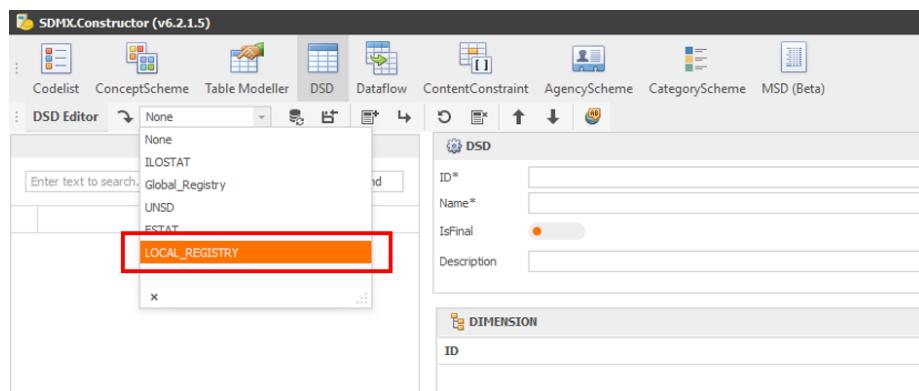
- Hit Save. It will generate a confirmation message, as shown below.



Click here to enlarge the image

- Press OK to confirm. The pop-up windows will go away.

- To confirm if the folder is accessible from the tool, in the Editor Ribbon area, if you go to the ‘Load from registry’ option, you will see the LOCAL_REGISTRY in the dropdown options.



[Click here to enlarge the image](#)

- The setup with a local folder is complete.

4.3 Preparing inputs

To demonstrate the key functionalities of the SDMX Constructor, it is helpful to have a dummy dataset modelled appropriately.

Imagine a country called Demoland and its National Statistical Office (NSO), Demoland NSO. Imagine the Demoland NSO is creating SDMX artefacts for its data in the following two tables.

Table 4.1: Unemployment Rate by sex and region

Region	2015	2015	2015	2016	2016	2016
	Men	Women	Both Sexes	Men	Women	Both Sexes
Cities and Towns	14.4	20.7	17.6	14.4	21	17.2
Urban Villages	27.8	30.3	29.1	28.2	29.4	29.1
Rural Areas	26.2	29.6	28	26.2	29.5	27.1

Region	2015	2015	2015	2016	2016	2016
Total	24	27.9	26	24	27.9	26

Table 4.2: Population outside the labour force by sex and age group (2022)

Age Group	Men	Women	Both Sexes
15-24	130,088	133,770	263,856
25-34	33,165	60,240	93,405
35-44	21,970	38,944	60,914
45-54	18,631	36,403	55,034
55-64	26,821	44,010	70,831
65+	45,323	78,725	124,048
Total	275,997	392,092	668,088

After modelling the data in both tables, we have the following ConceptScheme and Codelist arranged below. Note that the order of the columns in the following tables is per the SDMX Constructor's bulk load default templates (ConceptScheme and Codelist).

ConceptScheme:

Table 4.3: ConceptScheme

Concept ID	Concept Name	Description	Codelist ID
INDICATOR	Indicator	Refers to statistical measure describing a particular aspect of a social, economic or environmental phenomenon	CL_INDICATOR
UNIT_MEASURE	measure	Unit in which the observation values are expressed	CL_UNIT_MEASURE
SEX	Sex	State of being male or female	CL_SEX
GEO	Geographic area	Refers to Urban or Rural locations	CL_GEO
TIME_PERIOD	period	Timespan or point in time to which the observation refers	CL_TIME_PERIOD
FREQ	Frequency	Time interval at which observations occur over a given time period	CL_FREQ
AGE	Age groups	Length of time that an entity has lived or existed	CL_AGE
OBS_VALUE	Observation values	Refers to data or observation values	CL_OBS_VALUE

Codelist:

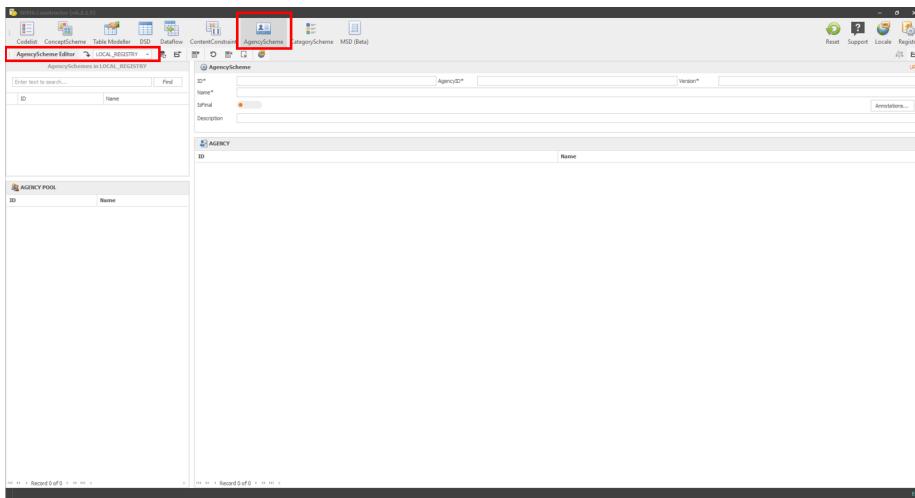
Table 4.4: Codelist

Codelist ID	Concept Name	Code ID	Code Name
CL_INDICATOR	Ricotor	UNER	Unemployment Rate
CL_INDICATOR	Ricotor	POLF	Population outside the labour force
CL_UNIT_MEASURE	measure	RT	Rate
CL_UNIT_MEASURE	measure	PS	Persons
CL_SEX	Sex	M	Men
CL_SEX	Sex	F	Women
CL_SEX	Sex	_T	Both Sexes (Total)
CL_GEO	Geographical area	M	Cities and Towns (Metropolitan Area)
CL_GEO	Geographical area	U	Urban Villages
CL_GEO	Geographical area	R	Rural Areas
CL_GEO	Geographical area	_T	Total
CL_FREQ	Frequency	A	Annual
CL_AGE	Age groups	15T24	15-24
CL_AGE	Age groups	25T34	25-34
CL_AGE	Age groups	35T44	35-44
CL_AGE	Age groups	45T54	45-54
CL_AGE	Age groups	55T64	55-64
CL_AGE	Age groups	GE65	65+
CL_AGE	Age groups	_T	Total

We will use these dummy datasets in this user manual to illustrate some critical functionalities of SDMX Constructor.

4.4 Creating AgencyScheme

- Start the SDMX Constructor, click the AgencyScheme button on top, and select the folder we created before, LOCAL_REGISTRY, from the AgencyScheme Editor's 'Load from registry' dropdown option, as shown below.

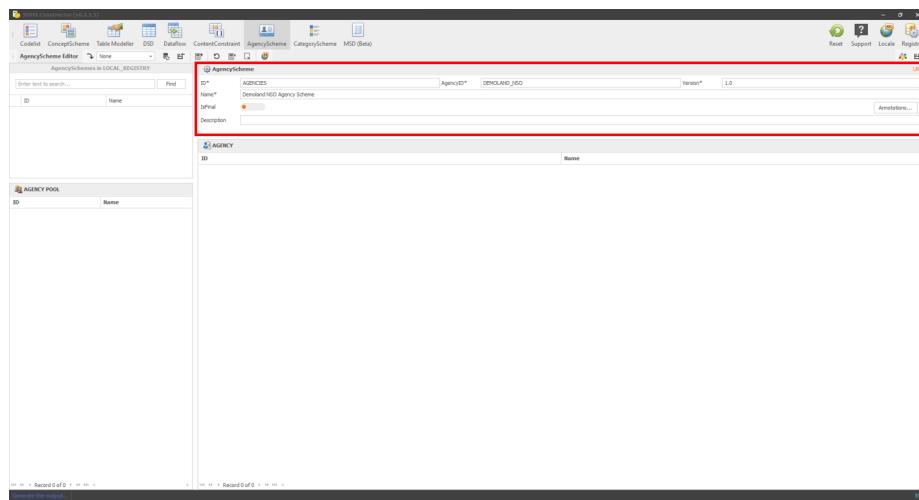


Click here to enlarge the image

- Create an AgencyScheme by entering the ID, AgencyID, Version and Name in the fields as shown below. For this exercise, we will have only Demoland NSO as an agency (all data are from Demoland NSO). We will do it in two stages. First, we will enter the properties for the AgencyScheme and then create the agency.

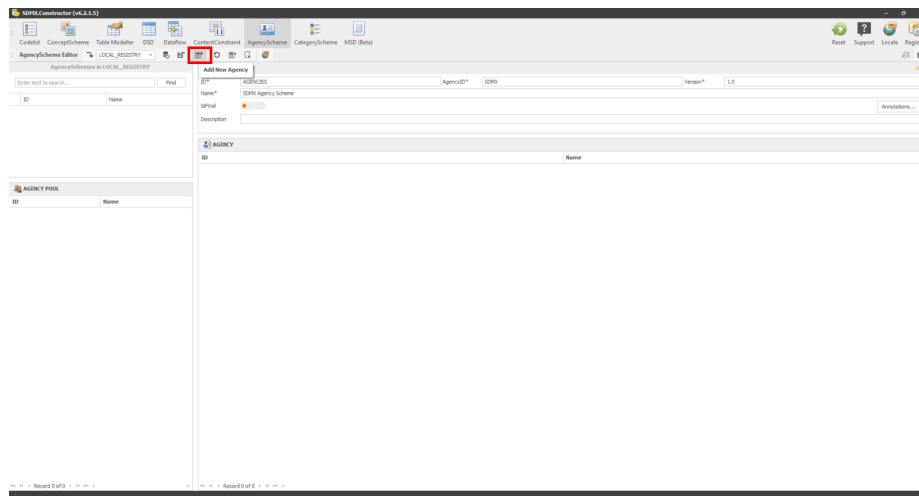
Note on IDs and versions: All SDMX artefacts, have a unique identifier: In case of AgencySchme these are Agency ID, ID, and Version. Each artefact is assigned a specific version number to keep track of changes and avoid conflicts. This makes sure that the artefacts are managed efficiently and can be easily shared and reused by others while also giving users control over the artefacts they create.

- For ID, enter AGENCIES; For AgencyID, enter Demoland_NSO; for version, enter 1.0; and for the Name, enter Demoland NSO Agency Scheme as shown below.



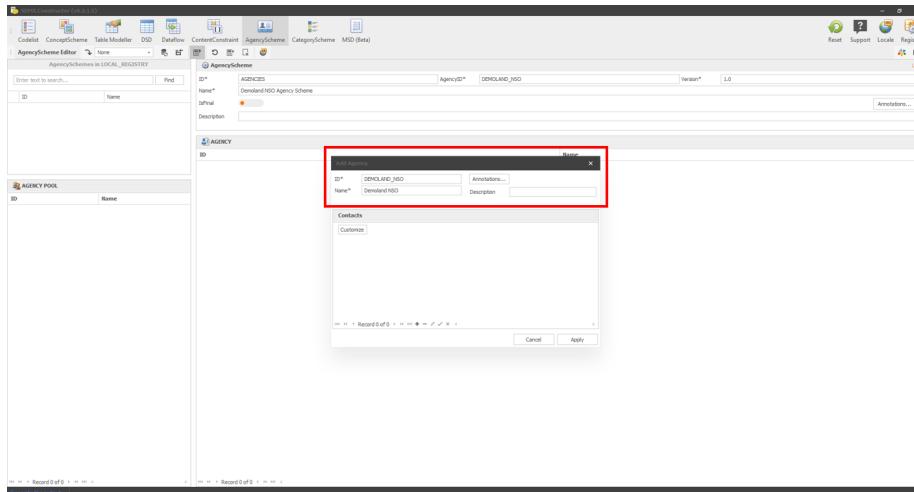
[Click here to enlarge the image](#)

- Now, we create the agency (as part of the AgencyScheme) by clicking on ‘Add New Agency’ as shown below.



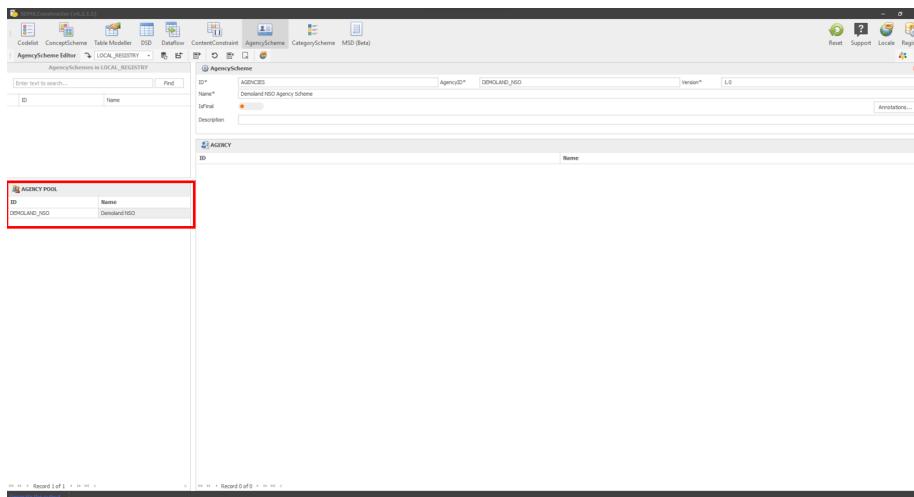
[Click here to enlarge the image](#)

- Clicking on ‘Add New Agency’ will open a pop-up window. We create the Demoland NSO agency by entering DEMOLAND_NSO in the ID and Demoland NSO in the Name field in the Add Agency pop-up and clicking Apply (as shown below).



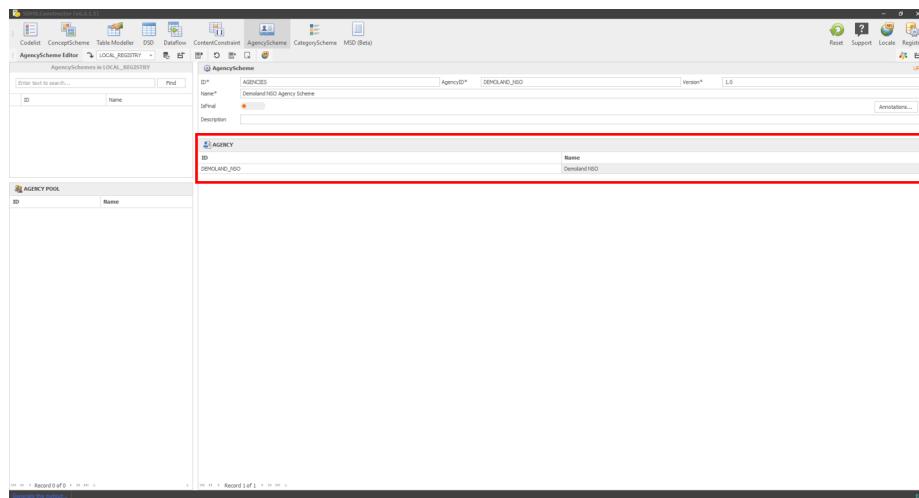
[Click here to enlarge the image](#)

- Once we finished creating the agency, it would look like the following (the agency will be in the AGENCY POOL).



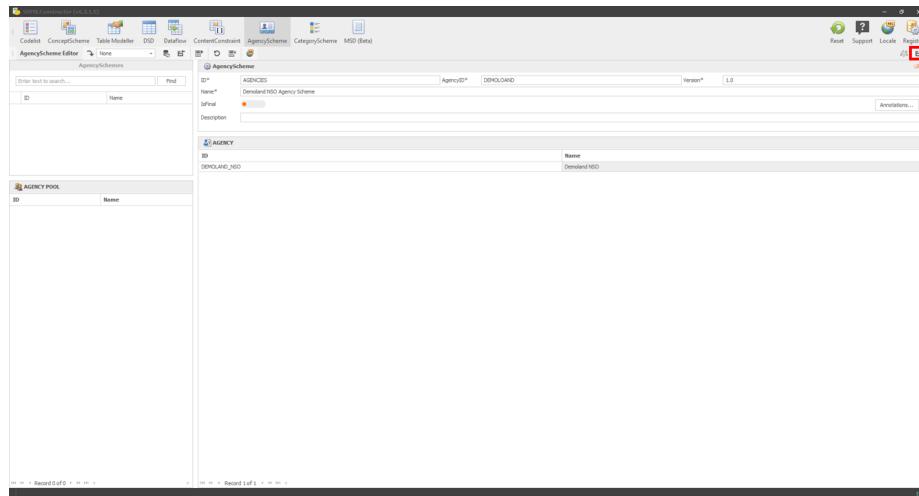
[Click here to enlarge the image](#)

- Move the agency from the AGENCY POOL to the AGENCY space on the right pane by selecting and dragging it. After the move, it would look like the following.



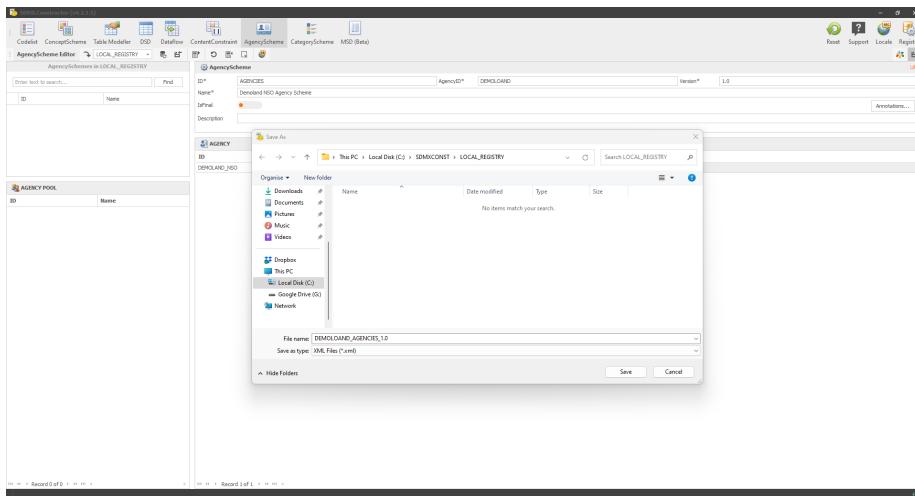
[Click here to enlarge the image](#)

- Click the Export button highlighted below to save the agency scheme in the folder.



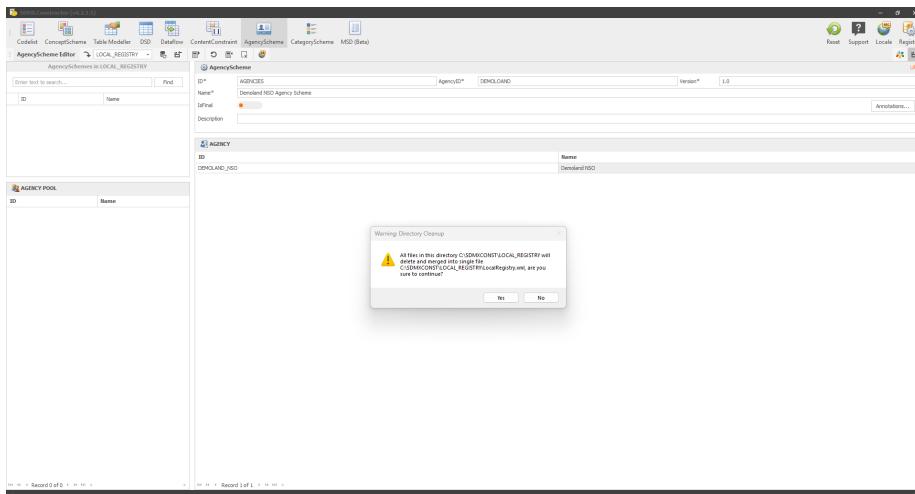
[Click here to enlarge the image](#)

- As shown below, a pop-up window will open to confirm the saving location.



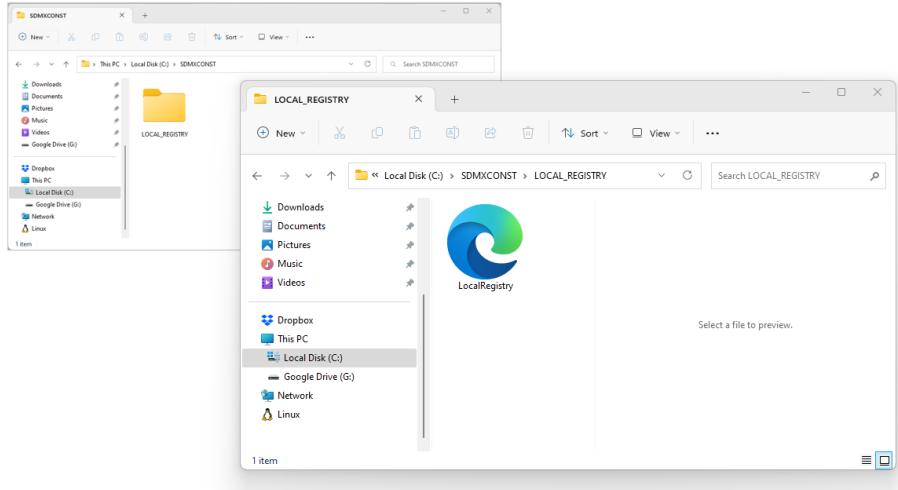
Click here to enlarge the image

- Clicking on Save will prompt another message (“All files in this directory (path) with delete and merged into a single file (path) are you sure to continue?”), as shown below.



Click here to enlarge the image

- Clicking on Yes will create and save an XML file in the folder we created before, as shown below.



[Click here to enlarge the image](#)

- Opening the file (LocalRegistry.xml) will show the agency scheme, as shown in the image below.

This screenshot shows a web browser window displaying the XML content of the 'LocalRegistry.xml' file. The title bar of the browser says 'LocalRegistry.xml'. The address bar shows the path 'C:/SDMXCONST/LOCAL_REGISTRY/LocalRegistry.xml'. The main content area of the browser displays the XML code:

```

<?xml version="1.0" encoding="UTF-8"?>
<message:Structure xmlns:message="http://www.sdmx.org/resources/sdmxml/schemas/v2_1/message"
    xmlns:structure="http://www.sdmx.org/resources/sdmxml/schemas/v2_1/structure"
    xmlns:common="http://www.sdmx.org/resources/sdmxml/schemas/v2_1/common">
    <message:Header>
        <message:ID>IDREF3</message:ID>
        <message:Test>false</message:Test>
        <message:Prepared>2023-03-27T11:24:53.619233+02:00</message:Prepared>
        <message:Sender id="Unknown"/>
        <message:Receiver id="Unknown"/>
    </message:Header>
    <message:Structures>
        <structure:OrganisationSchemes>
            <structure:AgencyScheme id="AGENCIES" agencyID="DEMOLOAD" version="1.0" isFinal="false">
                <common:Name xml:lang="en">Demoland NSO Agency Scheme</common:Name>
                <structure:Agency id="DEMOLOAD_NSO">
                    <common:Name xml:lang="en">Demoland NSO</common:Name>
                    <structure:AgencyScheme>
                    </structure:AgencyScheme>
                </structure:Agency>
            </structure:OrganisationSchemes>
        </message:Structures>
    </message:Structure>

```

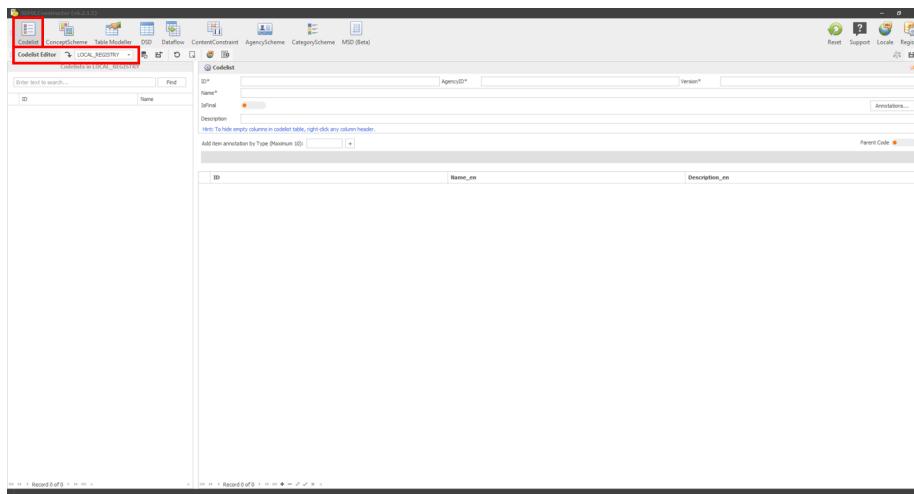
[Click here to enlarge the image](#)

4.5 Creating ConceptScheme & Codelist

We do this in one go. But first, we will upload the Codelist and then the ConceptScheme.

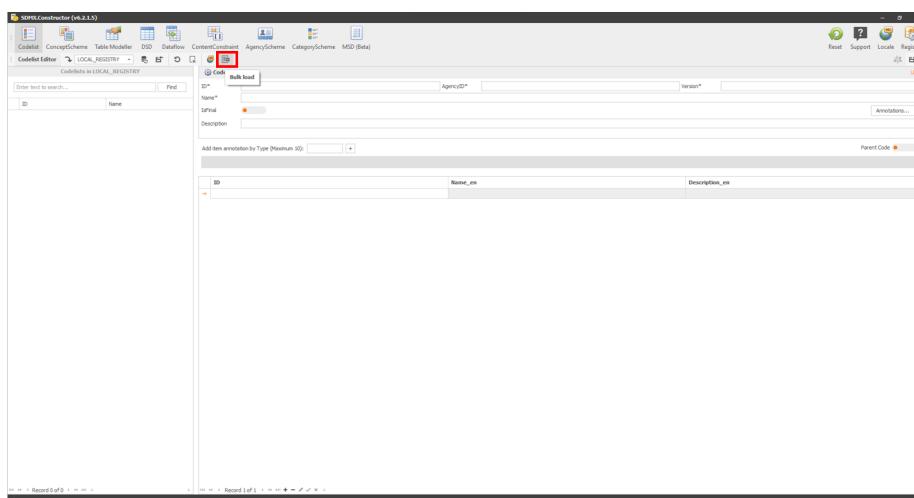
Create Codelist:

- Click on the Codelist button on top and ensure that the folder we created before, LOCAL_REGISTRY, is selected from the Codelist Editor's 'Load from registry' dropdown, as shown below.



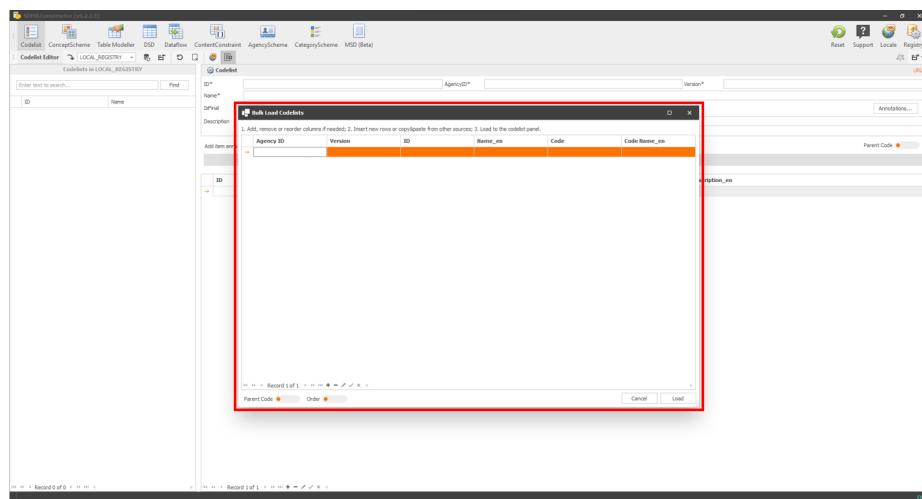
[Click here to enlarge the image](#)

- Click on the Bulk load button as shown below.



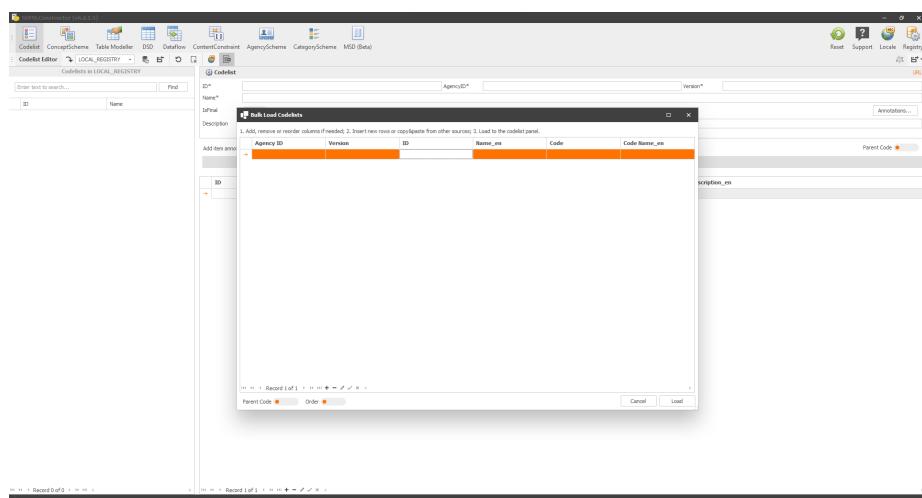
[Click here to enlarge the image](#)

- It will open up a pop-up window, as shown below.



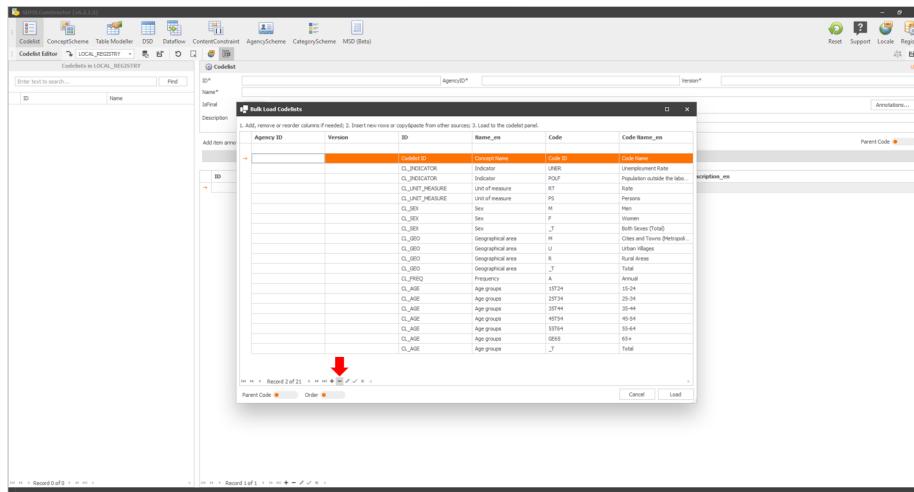
[Click here to enlarge the image](#)

- Copy the Codelist table (Table: 4.4) we prepared before and paste its contents here. Before pasting, remember to click on the ID column (shown in white in the image below). Then, select the entire row (by clicking on the little arrow pointing at the right) at the beginning of the rows).



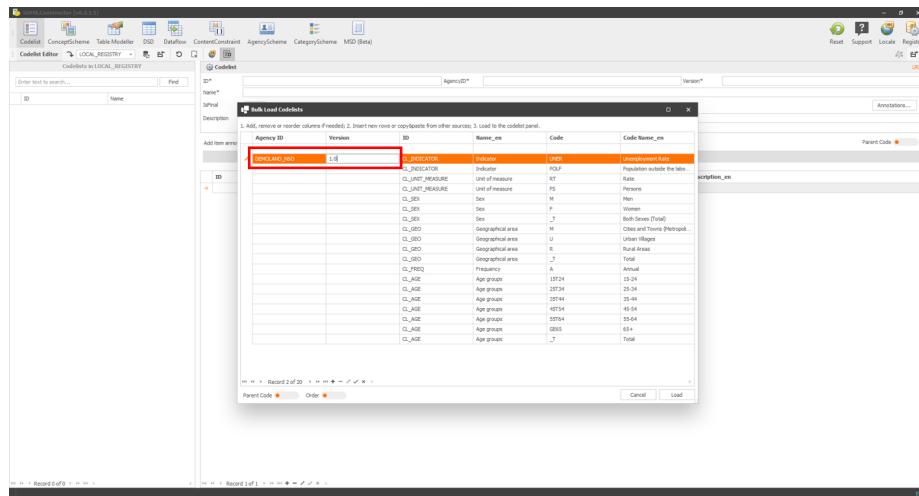
[Click here to enlarge the image](#)

- After pasting, remember to delete the header row. You can do this by selecting the entire row (by clicking again the little arrow pointing at the right at the beginning of the rows) and clicking the button (“-”) below, as indicated by a downward red arrow.



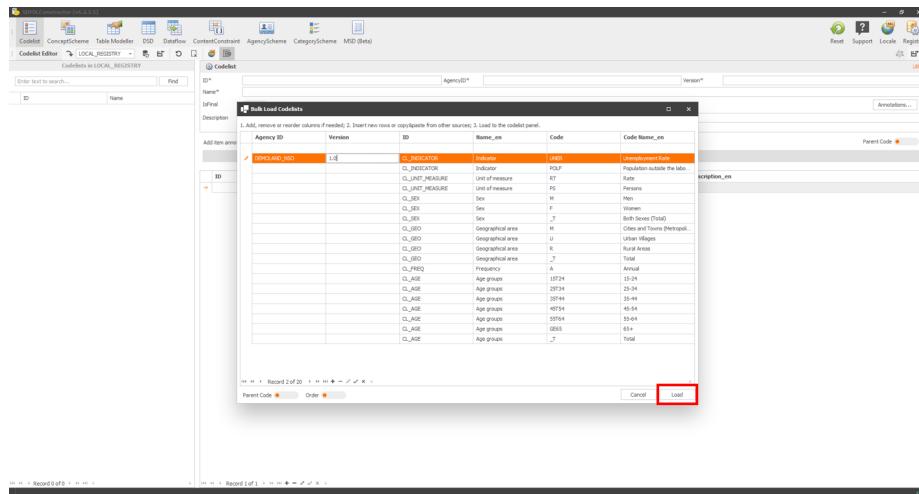
[Click here to enlarge the image](#)

- Enter the Agency ID and Version on the top row as DEMOLAND_NSO and 1.0, respectively, as shown below. If only the top row contains entries (DEMOLAND_NSO and 1.0) and the rest is empty, it implies that the Agency ID and Version are repeated for each row.



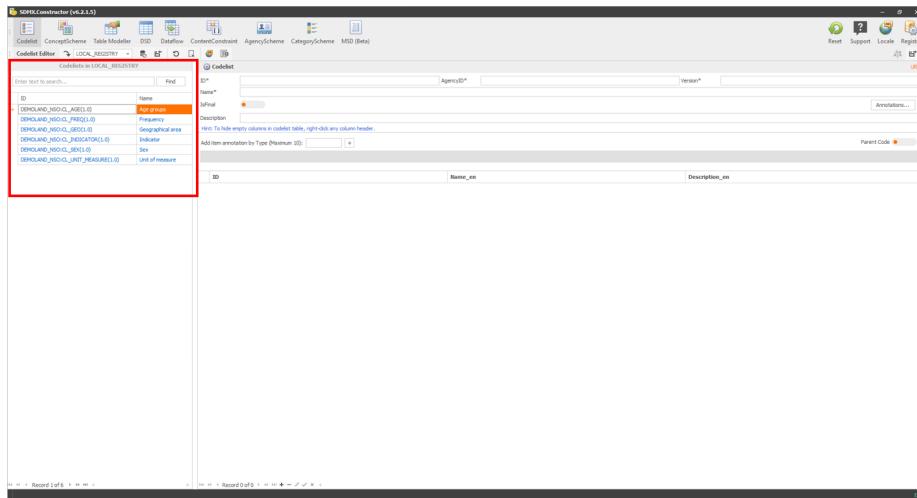
[Click here to enlarge the image](#)

- Click on Load, as shown below.



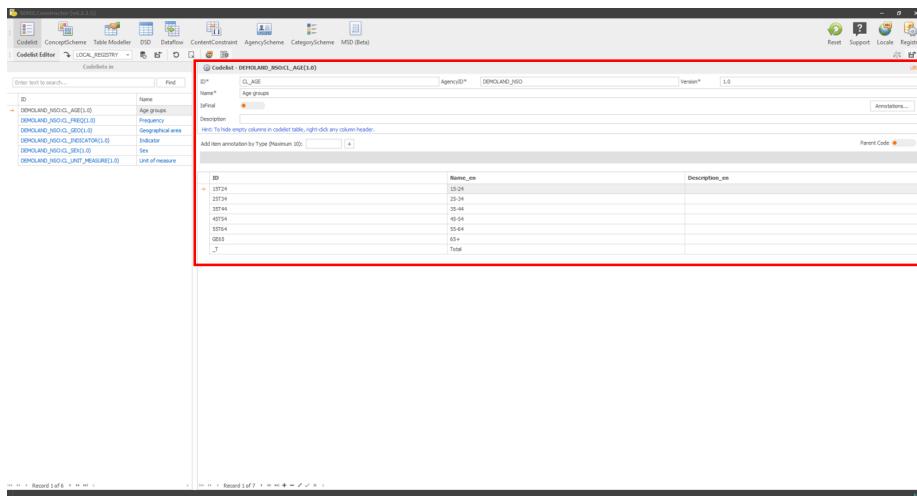
[Click here to enlarge the image](#)

- After the loading, this is how it would look (as shown below).



[Click here to enlarge the image](#)

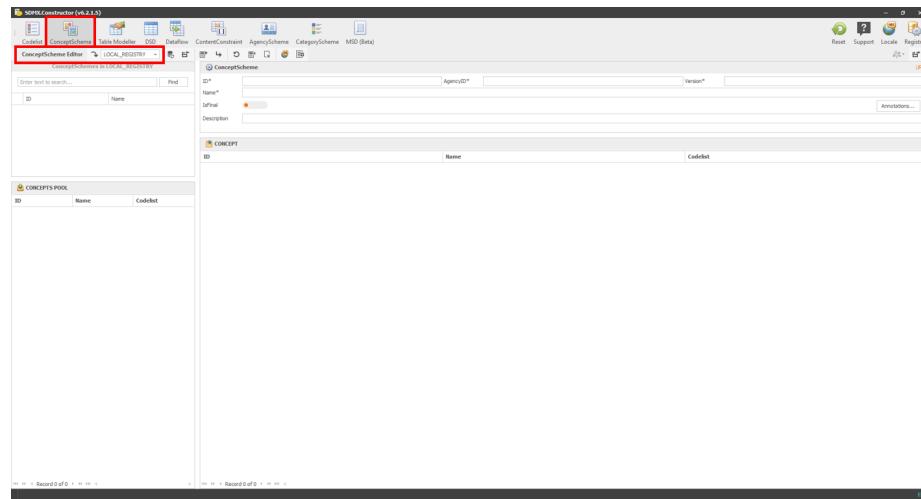
- Clicking on any item on this list will show the details on the right pane, as shown below.



[Click here to enlarge the image](#)

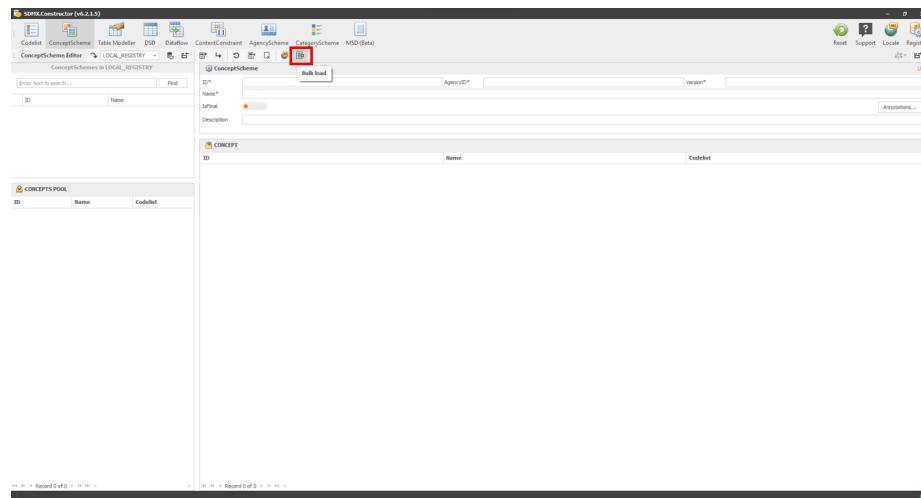
Create ConceptScheme:

- Click on the ConceptScheme button on top and ensure that the folder we created before, LOCAL_REGISTRY, is selected from the ConceptScheme Editor's 'Load from registry' dropdown option, as shown below.



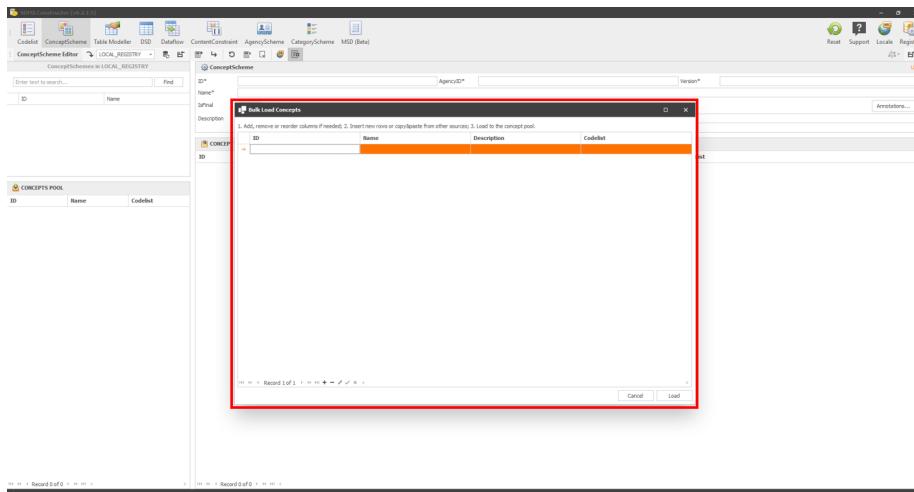
[Click here to enlarge the image](#)

- Click on the Bulk load button, as shown below.



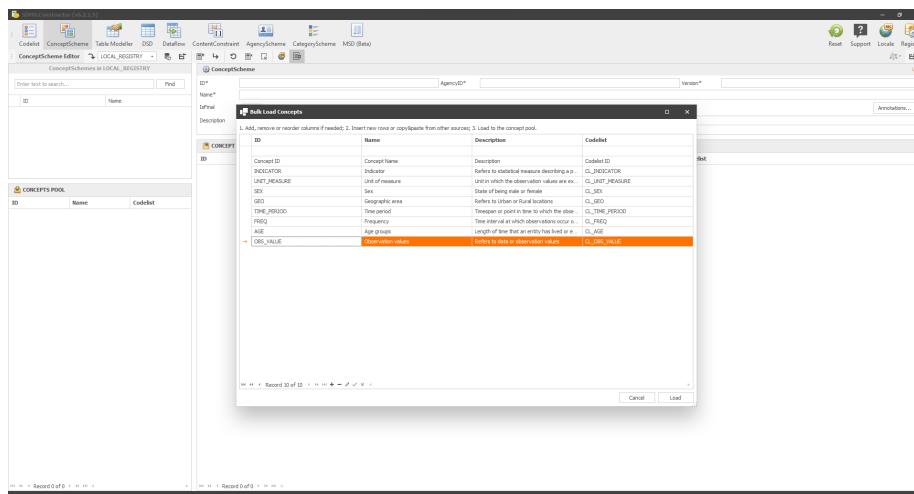
[Click here to enlarge the image](#)

- It will open up a pop-up window, as shown below.



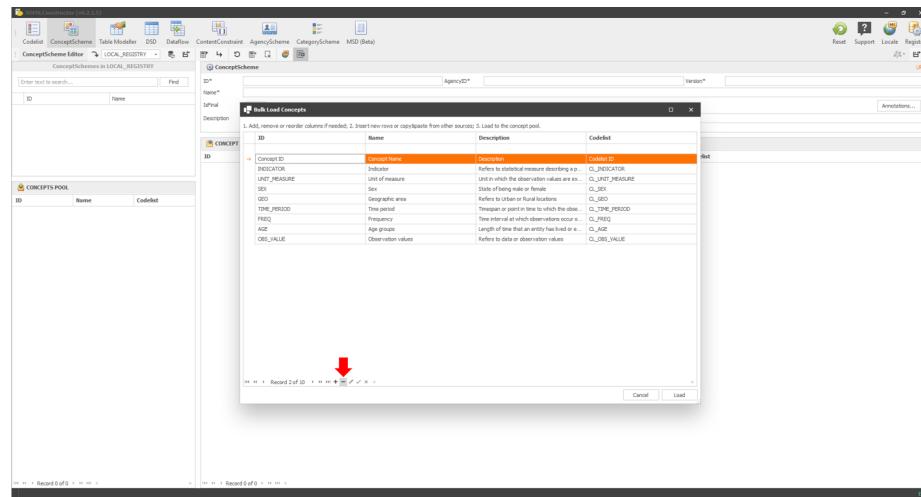
Click here to enlarge the image

- Copy the ConceptScheme table (Table: 4.3) we prepared before and paste its contents here. Before pasting, remember to click on the ID column and select the entire row (by clicking on the little arrow at the beginning of the rows).



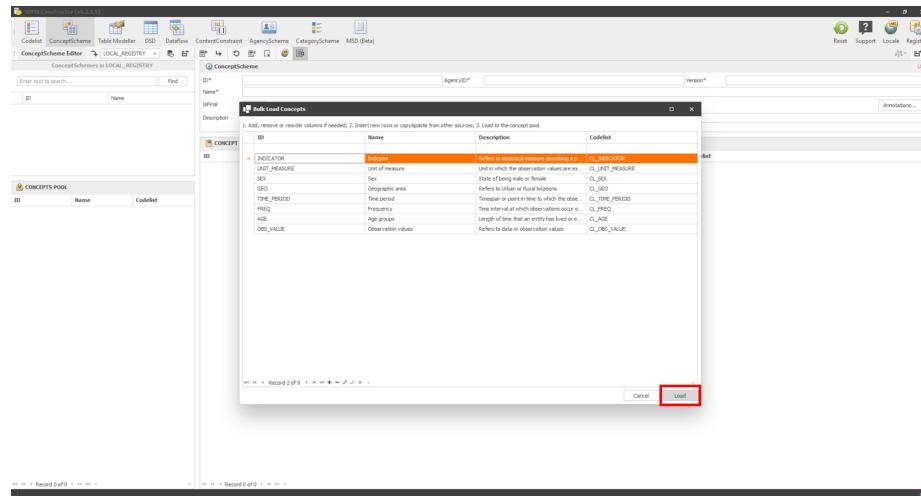
Click here to enlarge the image

- After pasting, remember to delete the header row by selecting the entire row and using the button ("–") below, as indicated by a downward red arrow.



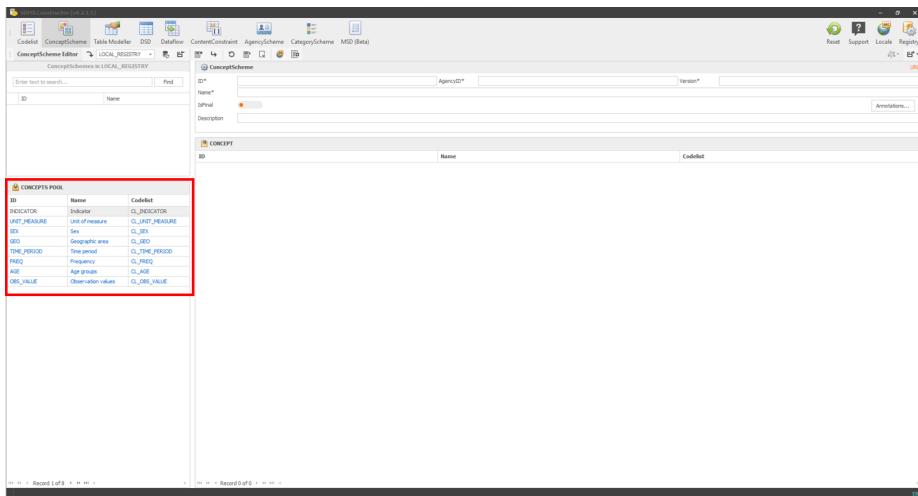
[Click here to enlarge the image](#)

- Click on Load, as shown below.



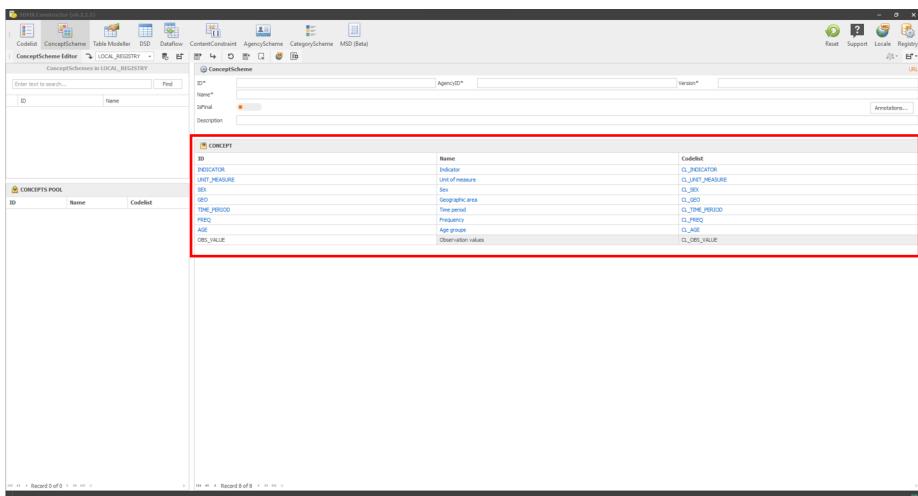
[Click here to enlarge the image](#)

- After loading, the concepts will be visible in the CONCEPT POOL, as shown below.



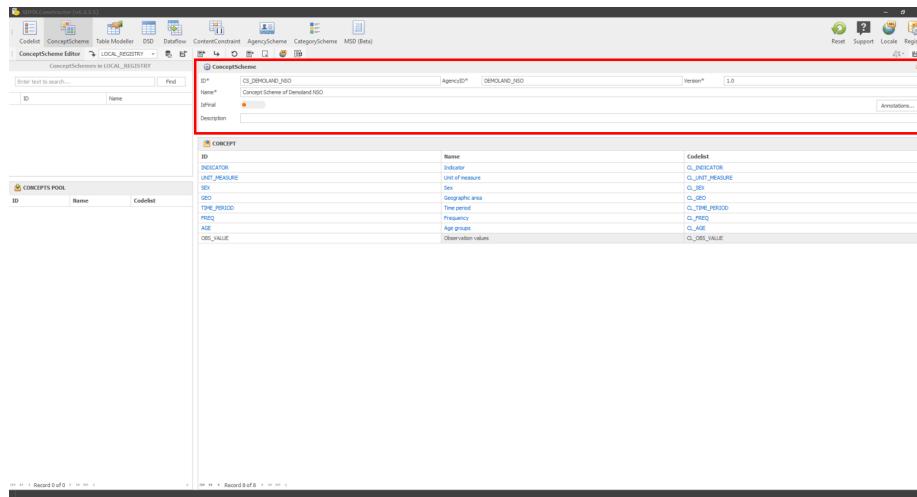
[Click here to enlarge the image](#)

- Move all the concepts from the CONCEPT POOL to the CONCEPT pane by selecting all (ctrl + a), then dragging and dropping. After the move, it would look like the following.



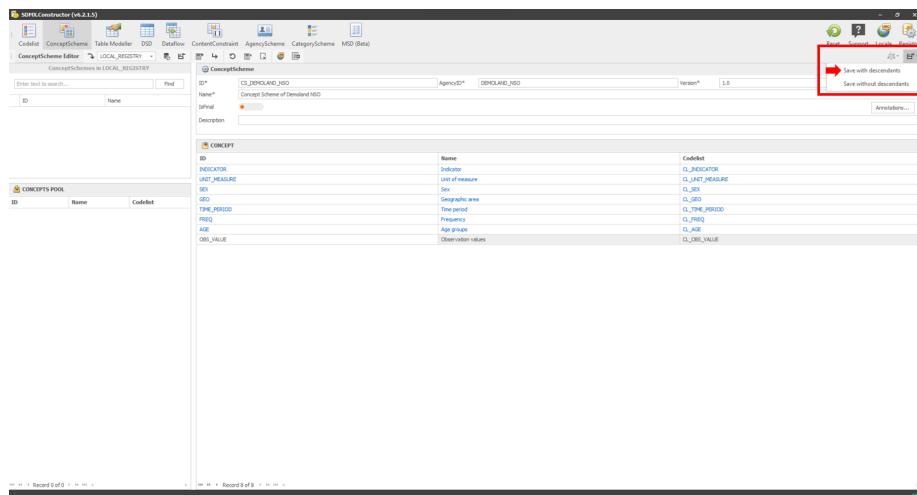
[Click here to enlarge the image](#)

- After moving the concepts, enter the details: (ID: CS_DEMOLAND_NSO, AgencyID: DEMOLAND_NSO, Version: 1.0, and Name: Concept Scheme of Demoland NSO) for the ConceptScheme, as shown below.



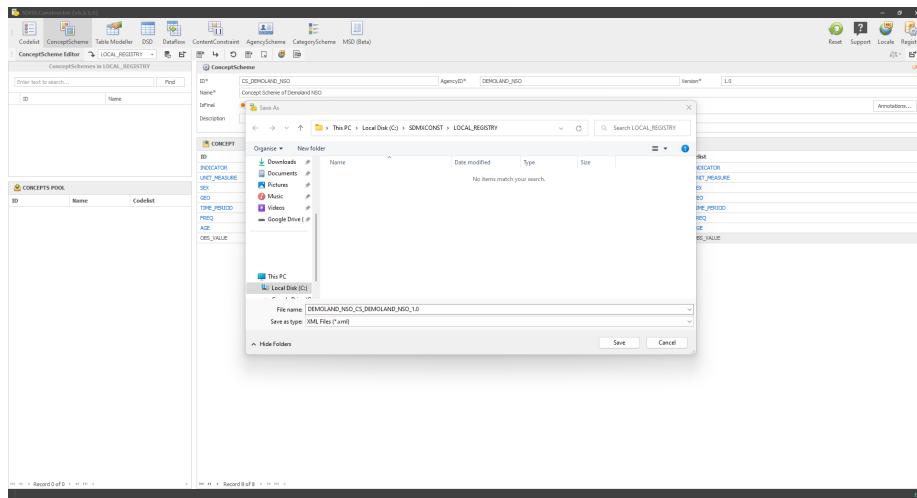
[Click here to enlarge the image](#)

- Then, click the ‘Save with descendants’ from the save option as shown below. This option, ‘Save with descendants,’ will save the concept scheme with the codelist.



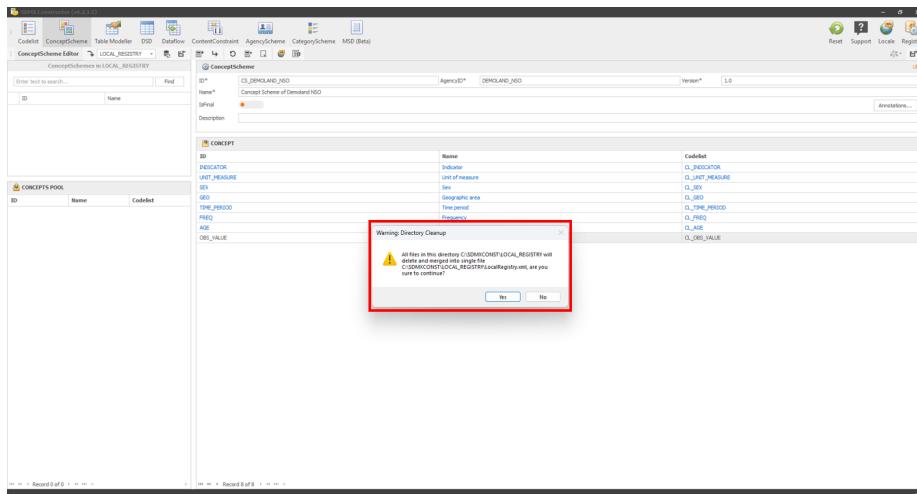
[Click here to enlarge the image](#)

- A pop-up message will ask to save the XML file in the folder (LOCAL_REGISTRY) we created before. Click on Save to save the file.



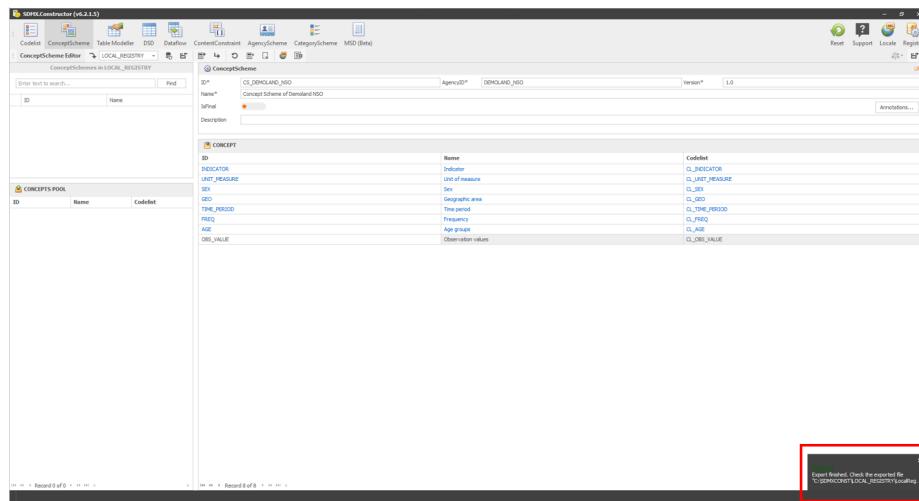
Click here to enlarge the image

- After clicking Save, the tool will ask the question to merge files. Select Yes.



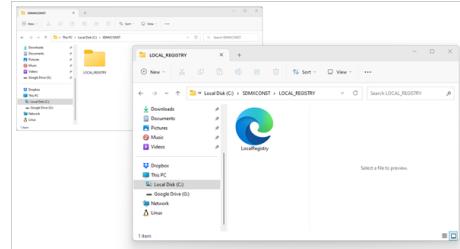
Click here to enlarge the image

- A confirmation message will appear for a short time at the bottom right corner, as shown below.



[Click here to enlarge the image](#)

- After that, if you go to the file's location, you will see the XML file created, as shown below.



[Click here to enlarge the image](#)

- Opening the XML file will show the details containing, AgencyScheme, ConceptScheme and Codelists.

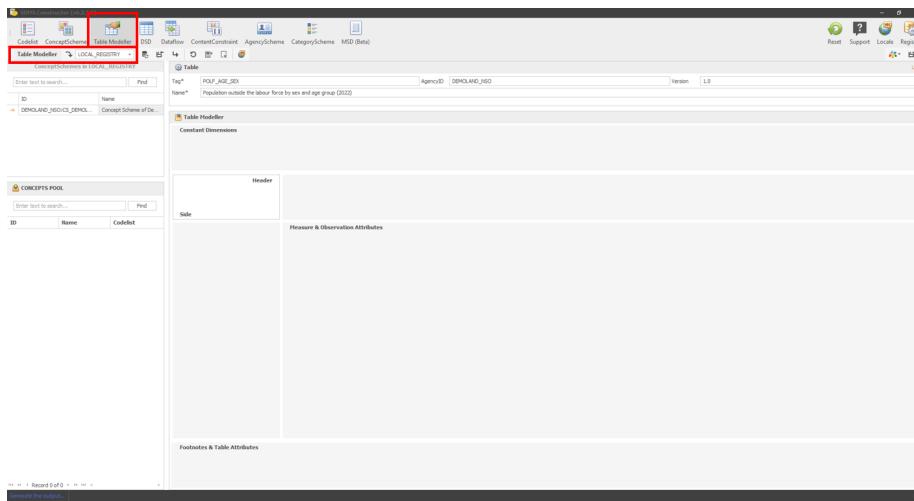
4.6 Creating DSD, Dataflow, ContentConstraint and CategoryScheme

Recalling our two initial tables (table: 4.1 and table: 4.2), we will now generate DSDs, ContentConstraints and Dataflows. We will also create a CategoryScheme. We can create all these artefacts through the Table Modeller option in the SDMX Constructor.

4.6. CREATING DSD, DATAFLOW, CONTENTCONSTRAINT AND CATEGORYSCHEME53

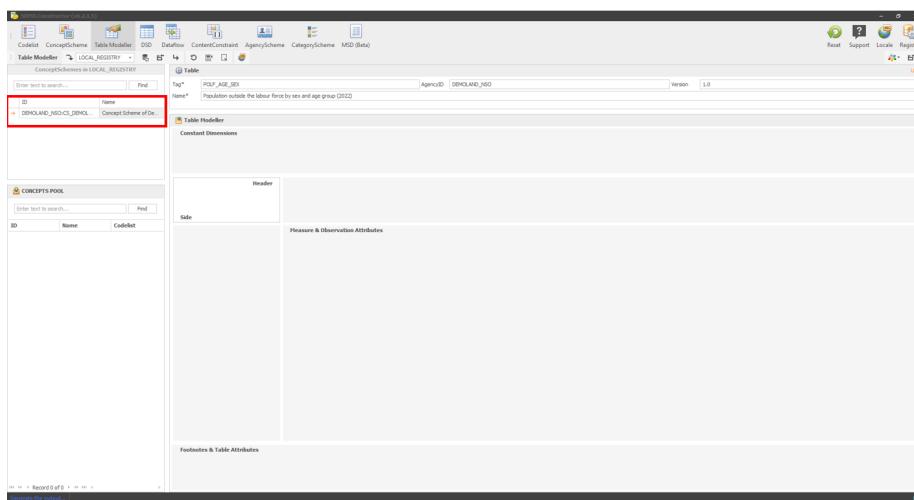
The Table Modeller offers the functionality to design statistical tables with an intuitive user interface to generate the SDMX artefacts that model it.

- Click on the Table Modeller button on top and ensure that the folder we created before, LOCAL_REGISTRY, is selected from the Table Modeller Editor's 'Load from registry' dropdown option, as shown below.



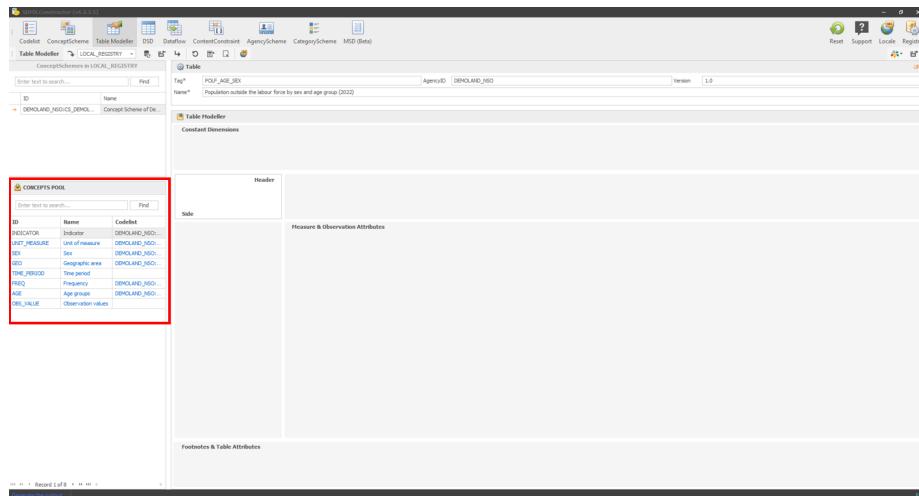
[Click here to enlarge the image](#)

- You will notice the concept scheme we created before, as highlighted below.



[Click here to enlarge the image](#)

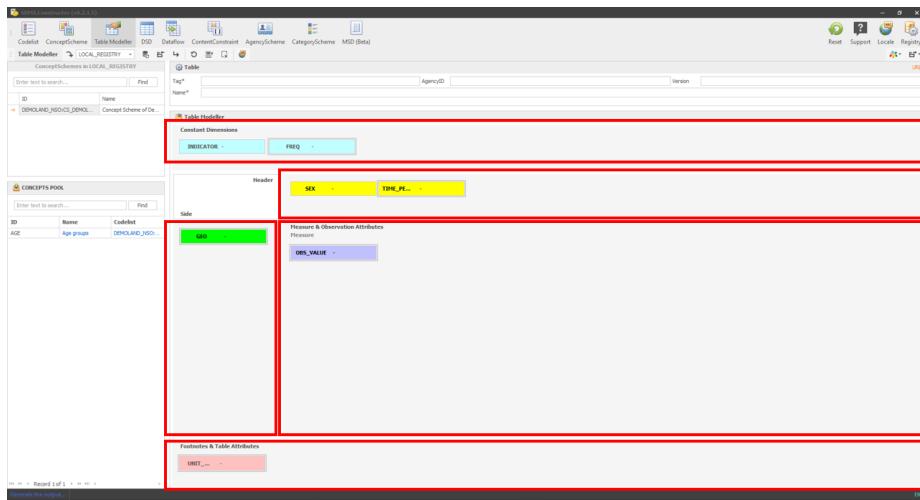
- Double-clicking the concept scheme will move it to the CONCEPT POOL, as shown below.



[Click here to enlarge the image](#)

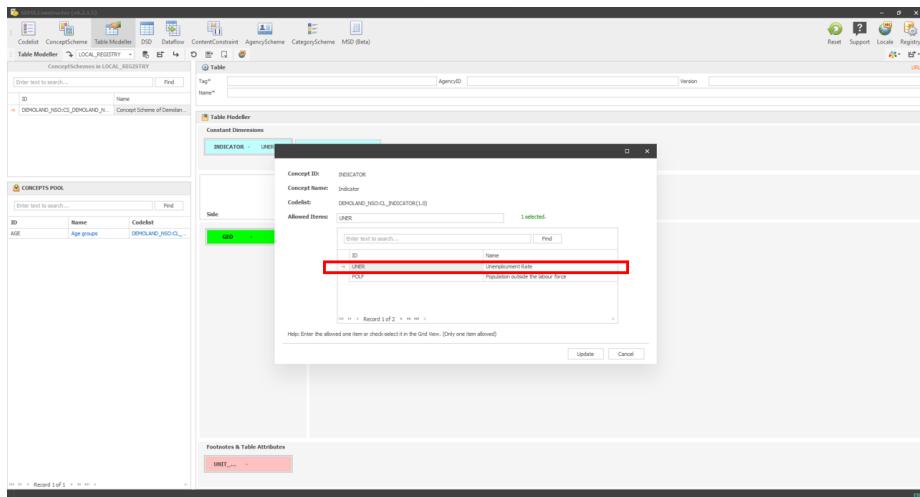
- Now, you can select the concepts in the CONCEPT POOL, then drag and drop them into various spaces (Constant Dimensions, Header, Side, Measures & Observation Attributes and Footnotes & Table Attributes) on the right pane. The logic driving where to drop each concept comes from our original tables (Tables 4.1 and 4.2).
- For Table 4.1 (Unemployment Rate by sex and region), the following distribution will be representative.

4.6. CREATING DSD, DATAFLOW, CONTENTCONSTRAINT AND CATEGORYSCHEME55



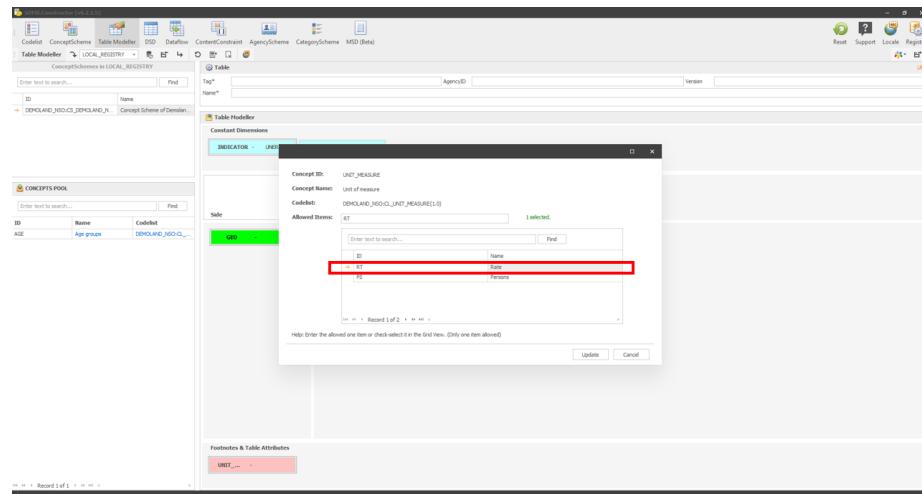
[Click here to enlarge the image](#)

- We can now apply two constraints: one for the indicator's name and the other for the unit of measure. The indicator's name will be the Unemployment Rate, which we can select by double-clicking the moved indicator concept as shown below.



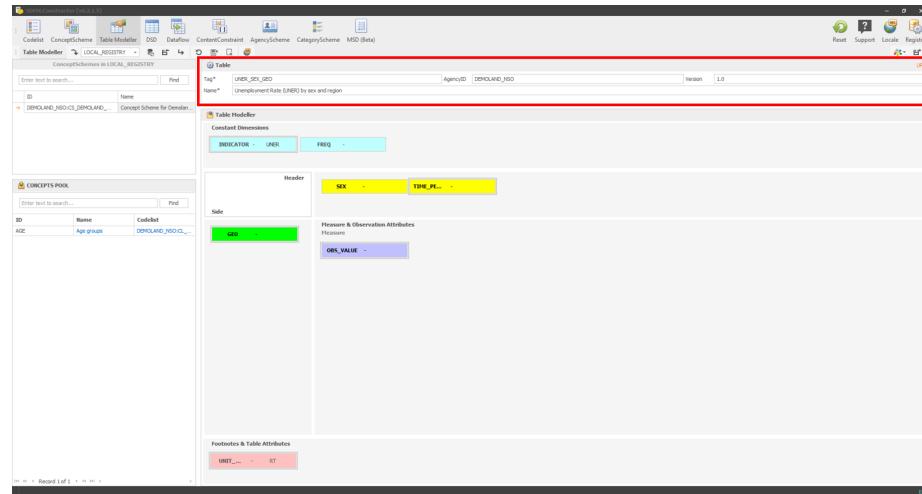
[Click here to enlarge the image](#)

- Another constraint would be the unit of measure. Because it is 'rate' (for Table 4.1), double-clicking the moved unit of measure concept would offer the option to select the rate. Select the Rate as shown below.



[Click here to enlarge the image](#)

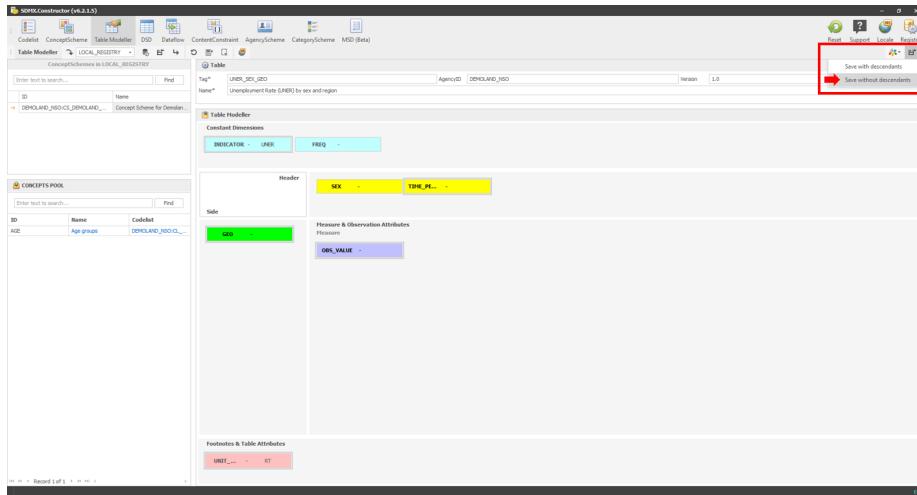
- Now we add the table information as shown below.



[Click here to enlarge the image](#)

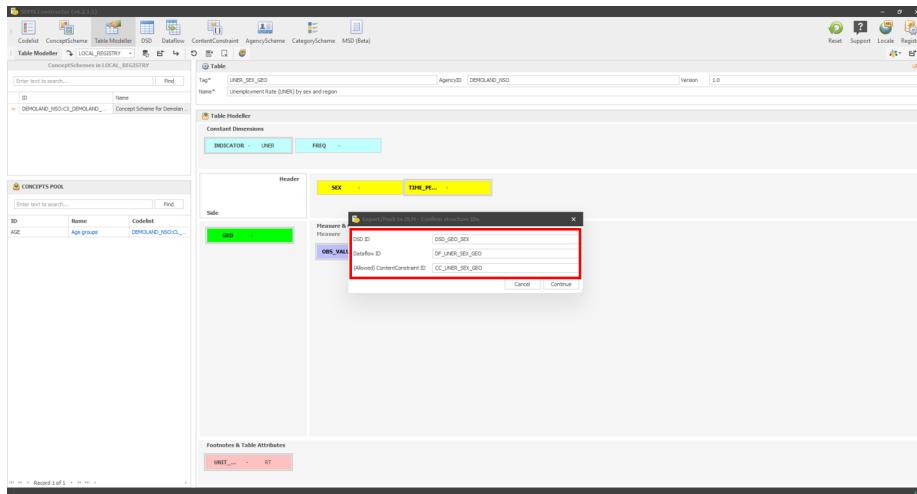
- Then we will hit save (select 'Save without descendants'), as shown below.

4.6. CREATING DSD, DATAFLOW, CONTENTCONSTRAINT AND CATEGORYSCHEME57



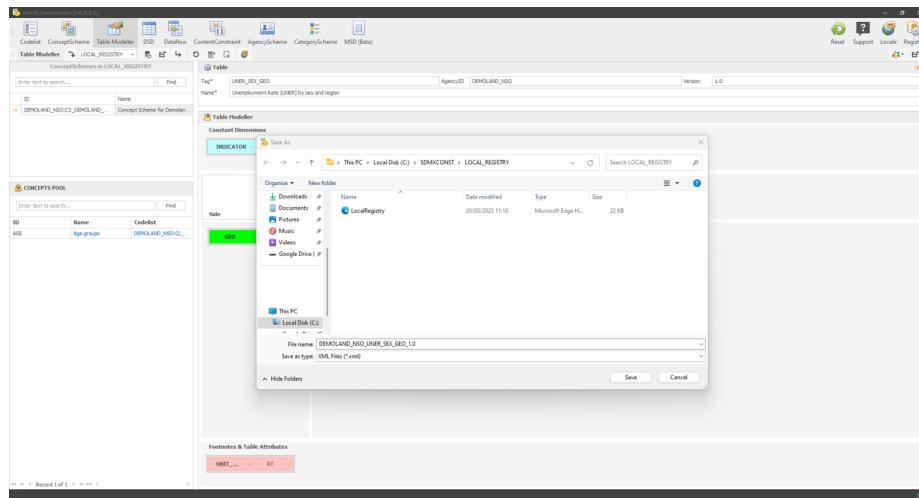
[Click here to enlarge the image](#)

- After saving, it will show a message as shown below.



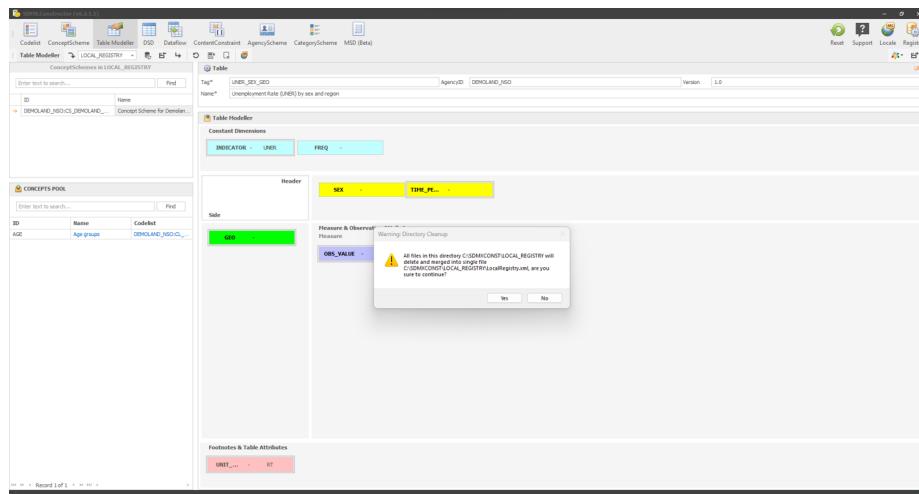
[Click here to enlarge the image](#)

- Clicking on Continue will result in a pop-up asking to save the file, as shown below.



[Click here to enlarge the image](#)

- Clicking Save will show this message and ask if the files should be merged.

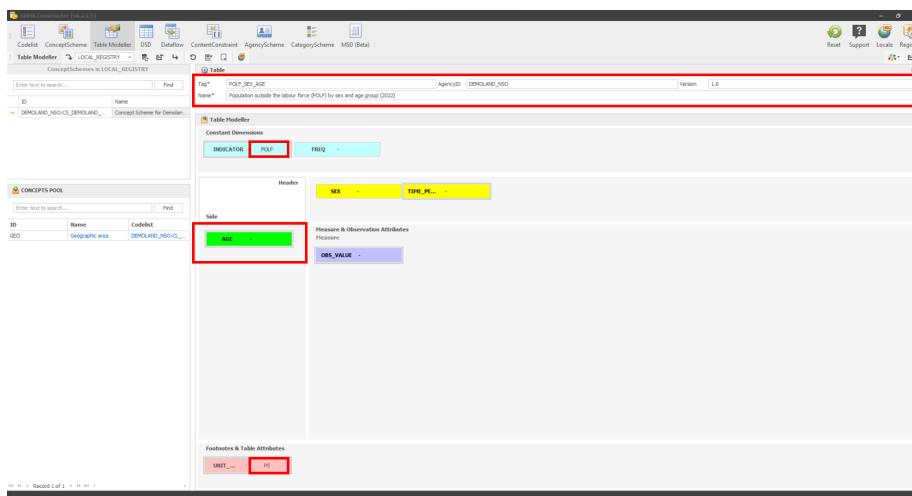


[Click here to enlarge the image](#)

- Clicking on Yes will merge the file.
- We will repeat the process for Table @ref(tab:table42) (Population outside the labour force by sex and age group (2022)). We can do that by moving Age to the ‘Side’ space (and removing the Geo back to the CONCEPT

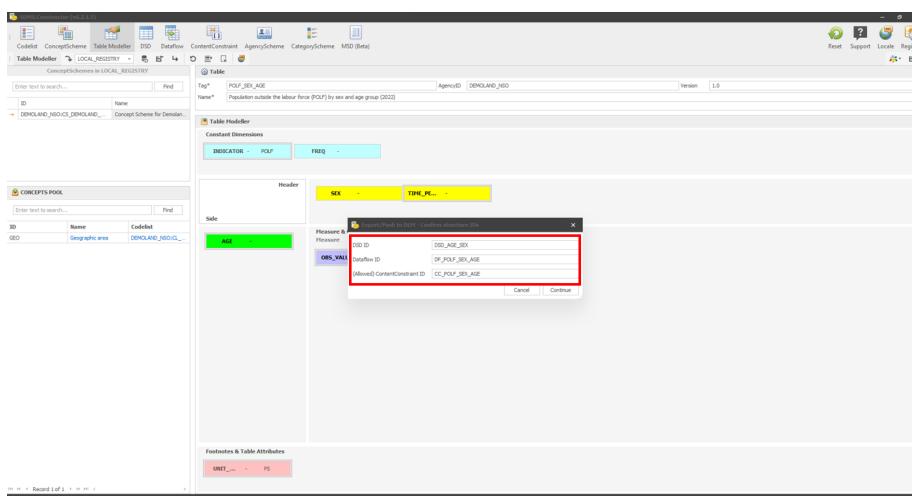
4.6. CREATING DSD, DATAFLOW, CONTENTCONSTRAINT AND CATEGORYSCHEME59

POOL), changing the constraints for the indicator to ‘Population outside the labour force’ and unit of measure to ‘Persons’, and updating the table information as shown below.



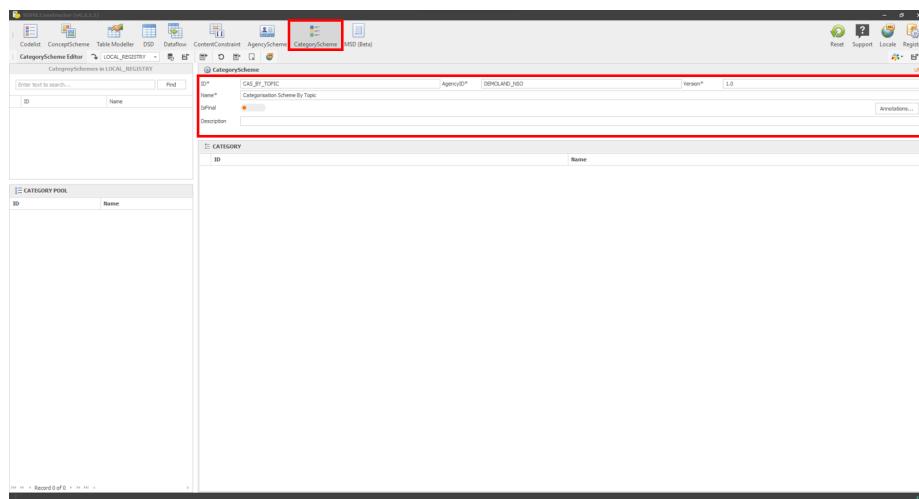
[Click here to enlarge the image](#)

- After hitting the save (Save without descendants) button, the message will read like the one below.



[Click here to enlarge the image](#)

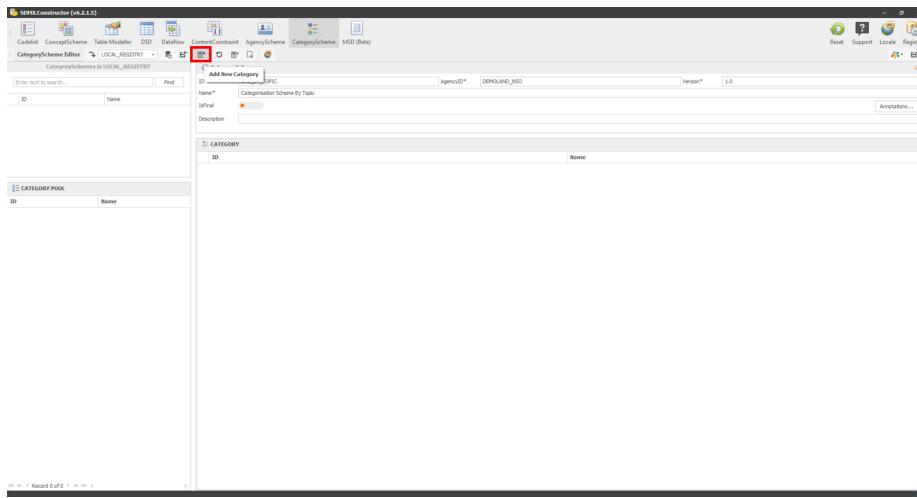
- Proceed with ‘Continue’, ‘Save’, and ‘Yes’ for merge.
- We should see two DSDs, two content constraints and two data flows. Remember, dataflows are the filtered view of the DSDs. Now, we can create a categorisation scheme. The categorisation could be by topics such as ‘Unemployment Rate’ and ‘Population outside the labour force’.
- First, we will click the CategoryScheme button and enter the properties (ID: CAS_BY_TOPIC, AgencyID: DEMOLAND_NSO, Version: 1.0 and Name: Categorisation Scheme By Topic) as shown below.



[Click here to enlarge the image](#)

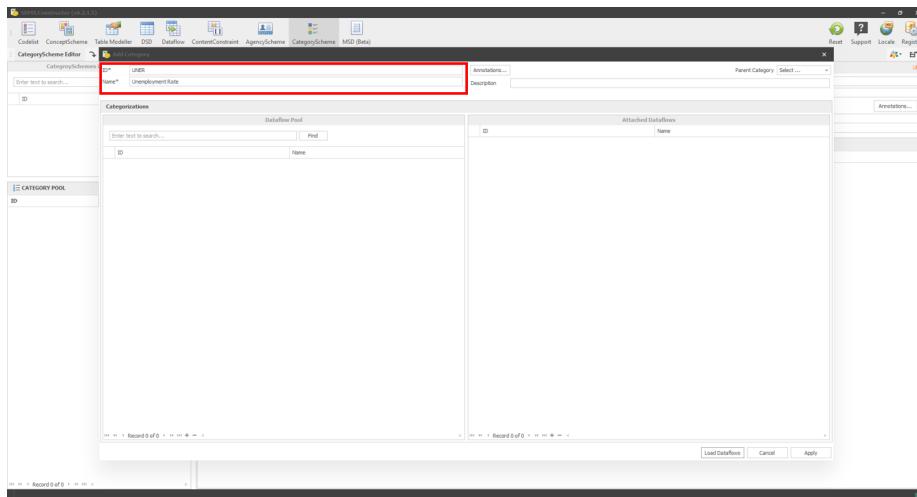
- Click on “Add New Category”, as shown below.

4.6. CREATING DSD, DATAFLOW, CONTENTCONSTRAINT AND CATEGORYSCHEME61



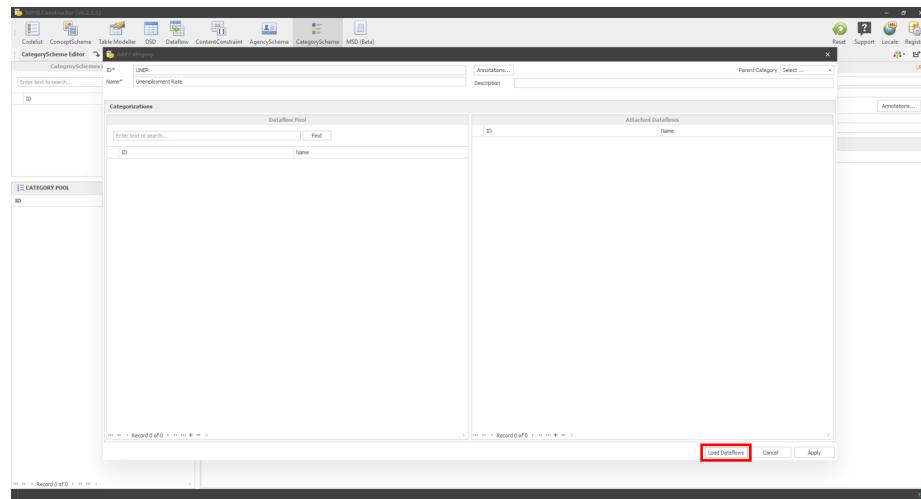
Click here to enlarge the image

- It will open a pop-up window, as shown below. Enter the details: ID: UNER (shorthand for Unemployment Rate) and Name: Unemployment Rate.



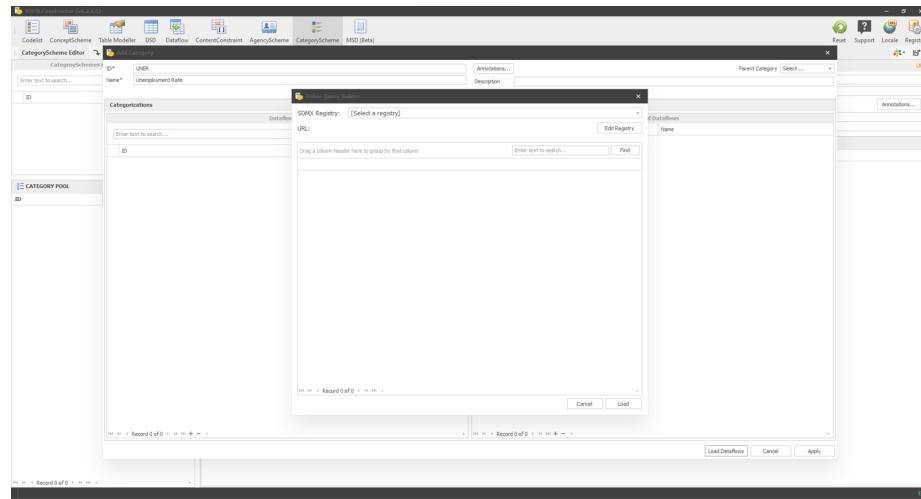
Click here to enlarge the image

- Click on the Load “Dataflows” button, as shown below.



[Click here to enlarge the image](#)

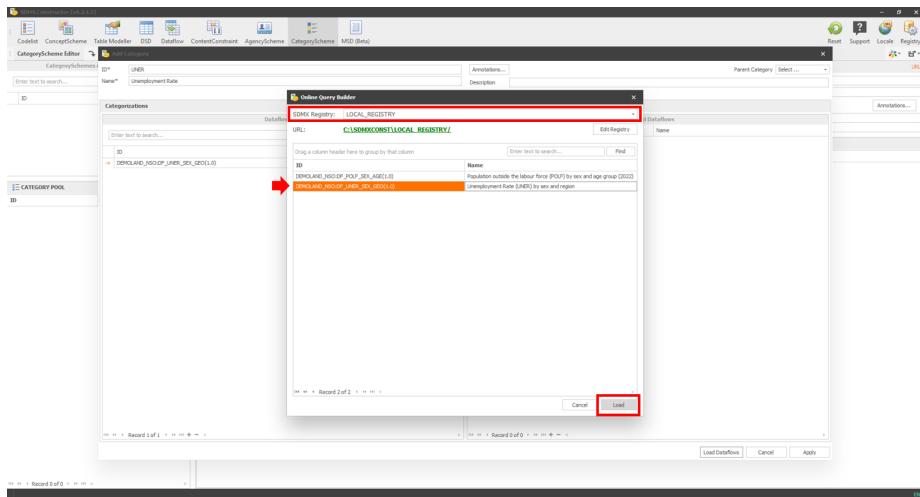
- It will open another pop-up window to select the dataflow through the Registry.



[Click here to enlarge the image](#)

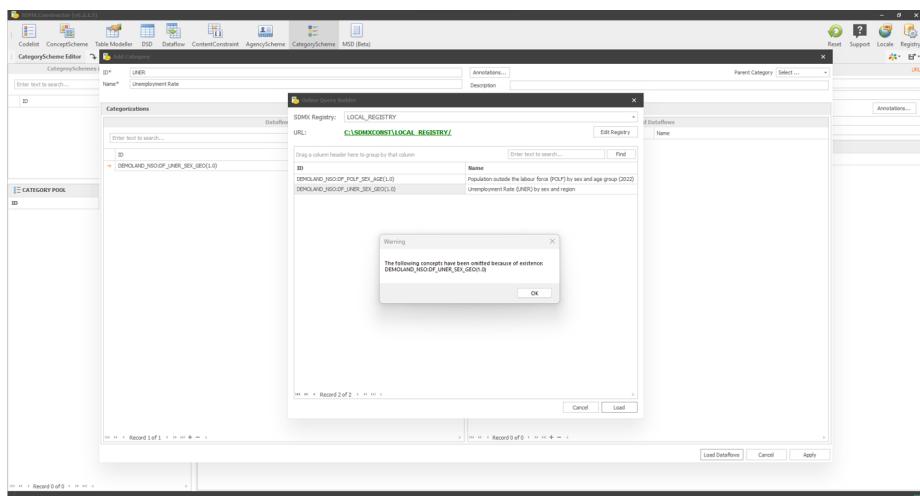
- Select the Registry (LOCAL_REGISTRY), then the dataflow, and press Apply as shown below.

4.6. CREATING DSD, DATAFLOW, CONTENTCONSTRAINT AND CATEGORYSCHEME63



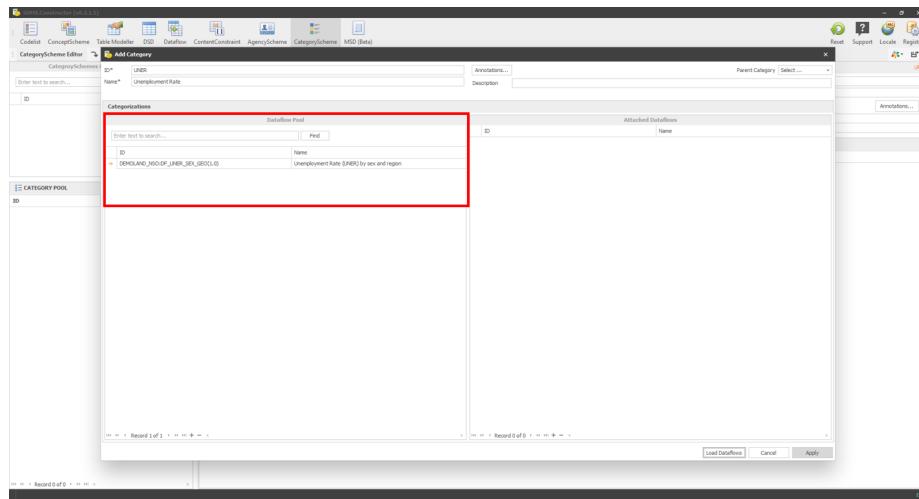
Click here to enlarge the image

- A message will appear as shown below.



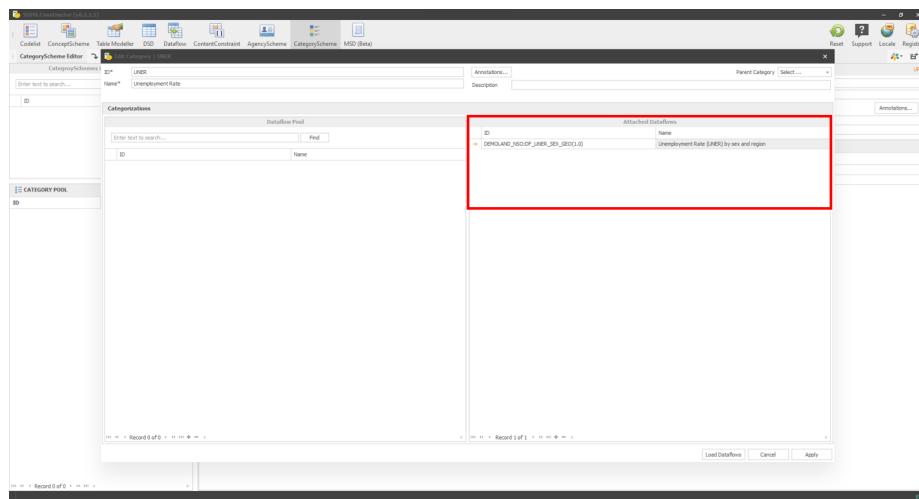
Click here to enlarge the image

- Clicking the OK button will lead you to the following window.



[Click here to enlarge the image](#)

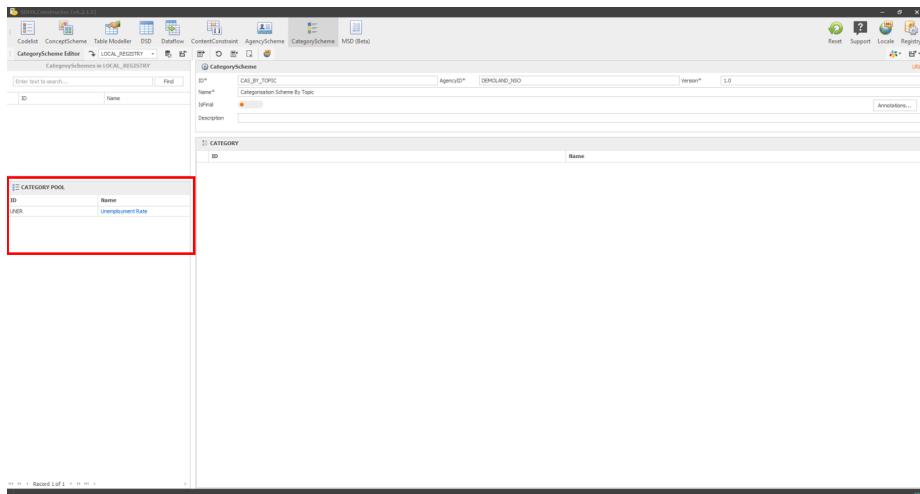
- As shown below, move (dragging and dropping) the dataflow to the ‘attached dataflows’ space.



[Click here to enlarge the image](#)

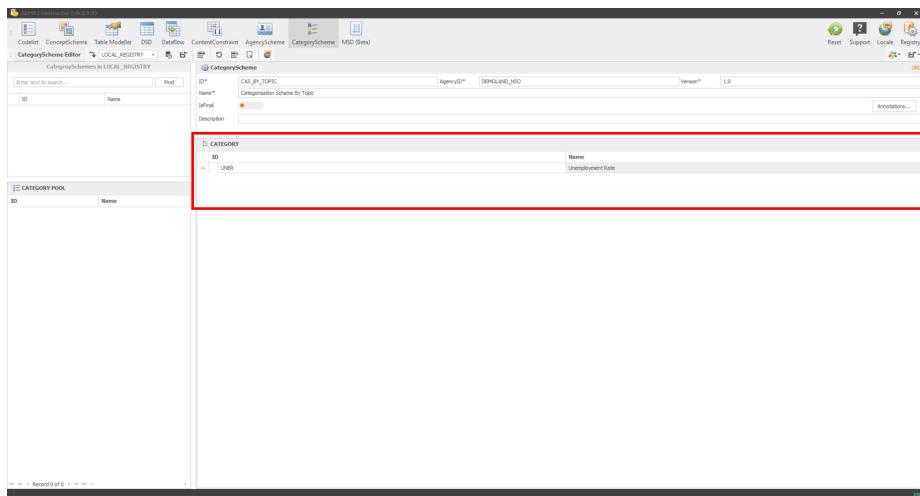
- Clicking “Apply” in that pop-up will take you to the following window, showing the entry into the CATEGORY POOL.

4.6. CREATING DSD, DATAFLOW, CONTENTCONSTRAINT AND CATEGORYSCHEME65



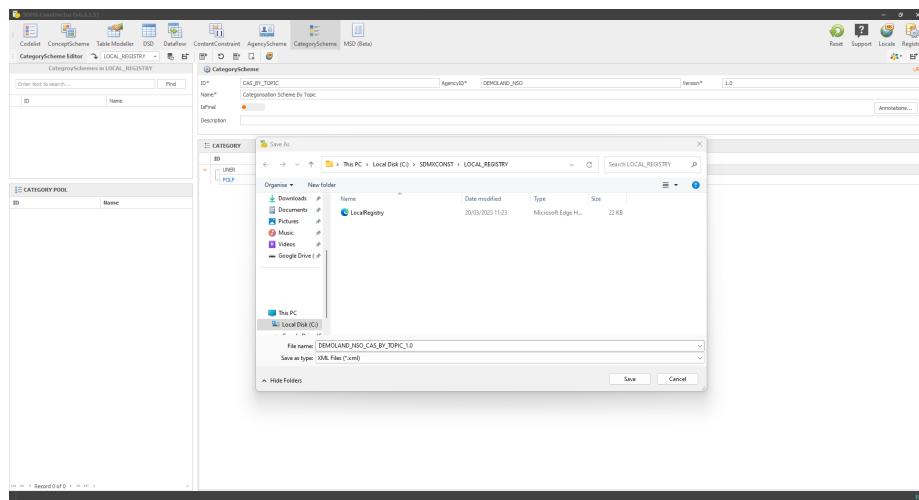
Click here to enlarge the image

- Move it to the right pane, as shown below.



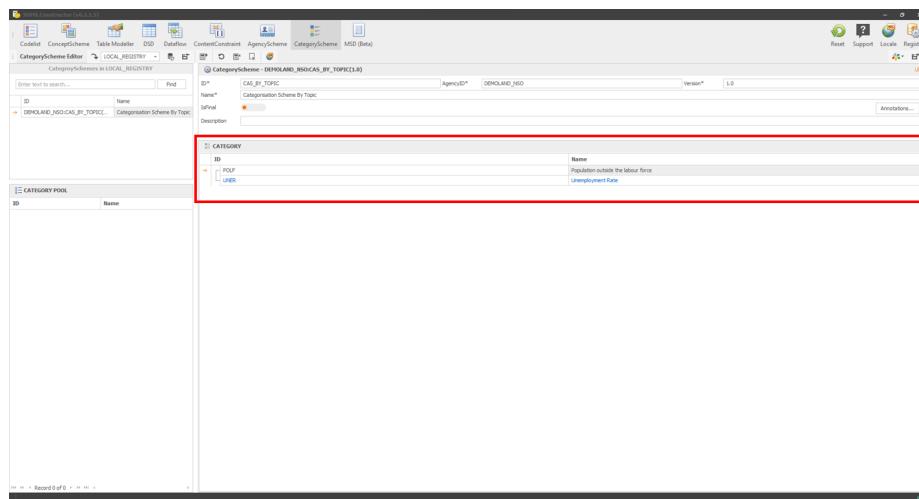
Click here to enlarge the image

- Then hit Save (Save without descendants), and it will show the pop-up windows to ensure the location where it saves the file, as shown below.



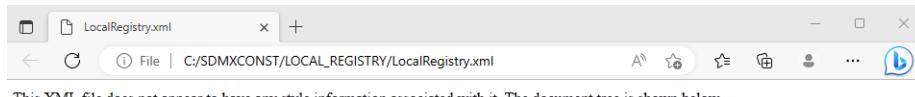
[Click here to enlarge the image](#)

- Clicking on Save will ask the confirmation to merge the file. Select Yes.
- Repeat the process for the other category, ‘Population outside the labour force’. The final view would be as follows:



[Click here to enlarge the image](#)

- The XML file (by going to the location of the folder we created before and opening the XML file) would be like the one below.



This XML file does not appear to have any style information associated with it. The document tree is shown below.

```

<?xml version="1.0" encoding="UTF-8"?>
<message:Structure xmlns:message="http://www.sdmx.org/resources/sdmxml/schemas/v2_1/message"
  xmlns:structure="http://www.sdmx.org/resources/sdmxml/schemas/v2_1/structure"
  xmlns:common="http://www.sdmx.org/resources/sdmxml/schemas/v2_1/common">
  <message:Header>
    ...
  </message:Header>
  <message:Structures>
    <structure:OrganisationSchemes>
      <structure:AgencyScheme id="AGENCIES" agencyID="DEMOLAND_NSO" version="1.0">
        ...
      </structure:AgencyScheme>
    </structure:OrganisationSchemes>
    <structure>Dataflows>
      <structure>Dataflow id="DF_POLF_SEX_AGE" agencyID="DEMOLAND_NSO" version="1.0">
        ...
      </structure>Dataflow>
      <structure>Dataflow id="DF_UNER_SEX_GEO" agencyID="DEMOLAND_NSO" version="1.0">
        ...
      </structure>Dataflow>
    </structure>Dataflows>
    <structure:CategorySchemes>
      <structure:CategoryScheme id="CAS_BY_TOPIC" agencyID="DEMOLAND_NSO" version="1.0" isFinal="false">
        ...
      </structure:CategoryScheme>
    </structure:CategorySchemes>
    <structure:Codelists>
      ...
    </structure:Codelists>
    <structure:Concepts>
      ...
    </structure:Concepts>
    <structure:DataStructures>
      <structure>DataStructure id="DSD AGE SEX" agencyID="DEMOLAND_NSO" version="1.0">
        ...
      </structure>DataStructure>
      <structure>DataStructure id="DSD GEO SEX" agencyID="DEMOLAND_NSO" version="1.0">
        ...
      </structure>DataStructure>
    </structure>DataStructures>
    <structure:Constraints>
      <structure:ContentConstraint id="CC_POLF_SEX_AGE" agencyID="DEMOLAND_NSO" version="1.0" type="Allowed">
        ...
      </structure:ContentConstraint>
      <structure:ContentConstraint id="CC_UNER_SEX_GEO" agencyID="DEMOLAND_NSO" version="1.0" type="Allowed">
        ...
      </structure:ContentConstraint>
    </structure:Constraints>
  </message:Structures>
</message:Structure>

```

[Click here to enlarge the image](#)

4.7 Working with .Stat Suite

The tool works as a back-end of the .Stat Suite. In two ways.

4.7.1 Uploading XML file to the Data Lifecycle Manager (DLM)

4.7.2 Connect to a new SDMX registry

Chapter 5

Special Topics

5.1 Annotations

5.2 Table Modeller

5.3 Translations using Google API/DeepL

5.4 Equations

Here is an equation.

$$f(k) = \binom{n}{k} p^k (1-p)^{n-k} \quad (5.1)$$

You may refer to using `\@ref(eq:binom)`, like see Equation (5.1).

5.5 Theorems and proofs

Labeled theorems can be referenced in text using `\@ref(thm:tri)`, for example, check out this smart theorem 5.1.

Theorem 5.1. *For a right triangle, if c denotes the length of the hypotenuse and a and b denote the lengths of the **other** two sides, we have*

$$a^2 + b^2 = c^2$$

Read more here <https://bookdown.org/yihui/bookdown/markdown-extensions-by-bookdown.html>.

5.6 Callout blocks

The R Markdown Cookbook provides more help on how to use custom blocks to design your own callouts: <https://bookdown.org/yihui/rmarkdown-cookbook/custom-blocks.html>

Chapter 6

Sharing your book

6.1 Publishing

HTML books can be published online, see: <https://bookdown.org/yihui/bookdown/publishing.html>

6.2 404 pages

By default, users will be directed to a 404 page if they try to access a webpage that cannot be found. If you'd like to customize your 404 page instead of using the default, you may add either a `_404.Rmd` or `_404.md` file to your project root and use code and/or Markdown syntax.

6.3 Metadata for sharing

Bookdown HTML books will provide HTML metadata for social sharing on platforms like Twitter, Facebook, and LinkedIn, using information you provide in the `index.Rmd` YAML. To setup, set the `url` for your book and the path to your `cover-image` file. Your book's `title` and `description` are also used.

This `gitbook` uses the same social sharing data across all chapters in your book—all links shared will look the same.

Specify your book's source repository on GitHub using the `edit` key under the configuration options in the `_output.yml` file, which allows users to suggest an edit by linking to a chapter's source file.

Read more about the features of this output format here:

<https://pkgs.rstudio.com/bookdown/reference/gitbook.html>

Or use:

```
?bookdown::gitbook
```