NITI Aayog

National Institution for
Transforming India

GI DASHBOARD

User Manual for
Formula

Version 1.0

Revision History

Revision No.	Revision Date	Author	Approved Date	Approved By	Description

Table of Contents….

1 Introduction

The **Government of India** had decided that to measure and monitor India's performance on various social, economic and other parameters through internationally recognized **Global Indices**.

The goal of this exercise are to use these Indices as tools for self-improvements and bring about reforms in the policies and processes of Government agencies and bring about reforms in the policies and processes of Government agencies and financial institutions while creating a conducive ecosystem for foreign and domestic investment flow.

Goals

- Driving reforms at the National and State level by ranking of States
- Promoting cooperative and competitive federalism
- Enhancing citizen service delivery, ease of living and ease of doing business

About the dashboard:

The dashboard is created to support the Government's decision to leverage the monitoring mechanism of select global indices to drive reforms and growth. The dashboard allows for monitoring of the parameters as per official data as well as the data source used by the publishing agency. The dashboard also allows for monitoring of performance of states and it also inculcates healthy competition among States/UTs through their scoring and ranking on these Indices and Reform Actions.

This manual illustrates the functionality for India Index Module, its creation, mapping and Data Entry and functions at various user levels. It also covers the score/Rank calculation types (manual and formula) and frequency of Data Entry. Care is taken to explain each function minutely.

1.1 Purpose

The purpose of this user manual is to provide an insight on Formula Editor and its usage. The flow of adding and calculating the scores in Formula based Indices. This manual serves the requirement of Nodal Administrator on how to create, Edit or recalculate the Scores at all nodes of the Index.

As you complete reading this document, you will be able to:

- Explain the Formula Editor, Functions and Statistical Functions
- Add Formula /Edit Formula and Delete Formula
- Recalculate the Scores
- Add Formula at intermediate level of the Index
- Formulas impact on:
    - Calculation Types

- Frequency
- Data Population
- Data Approval
- Visualize Scores at All levels based on Formula under Visualization

1.2 Organization Structure

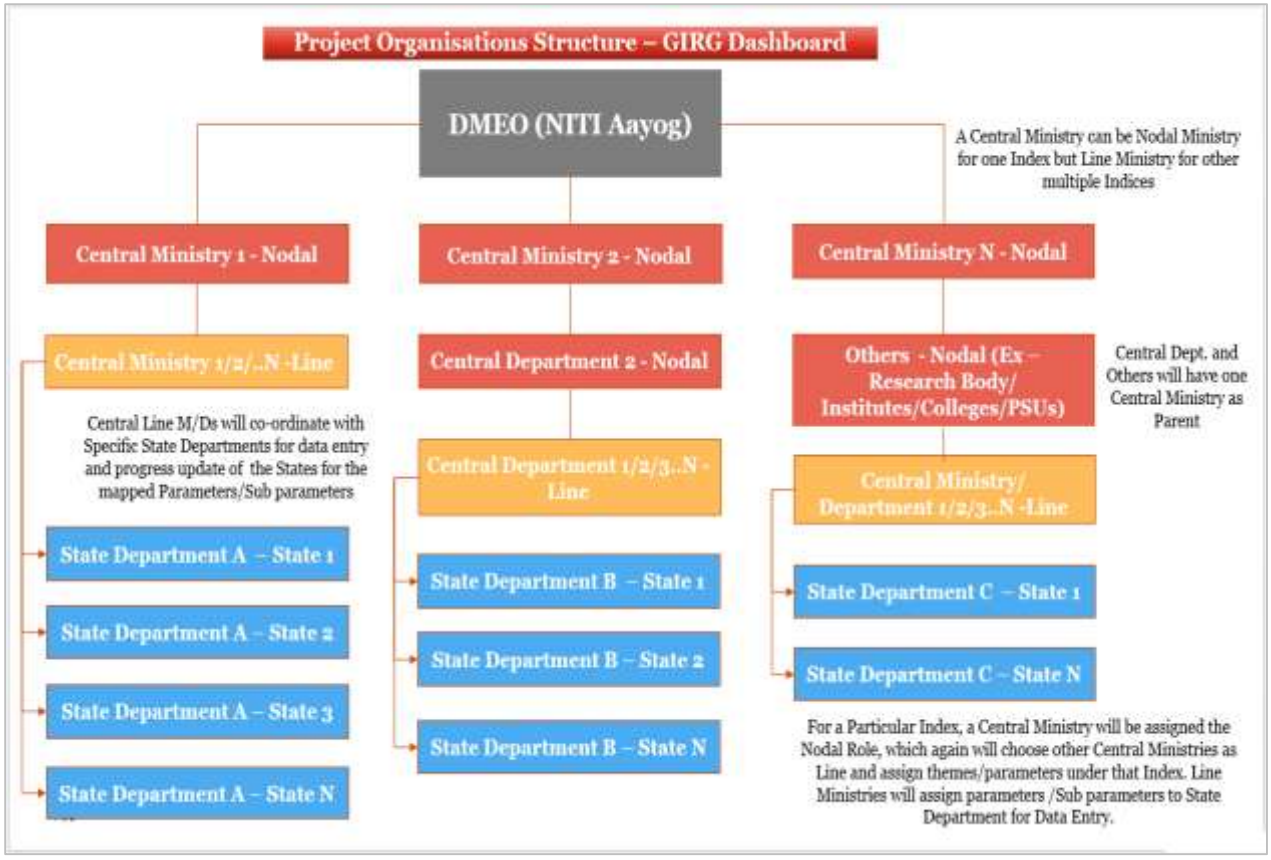


Figure 1-1

1.3 Users & Roles

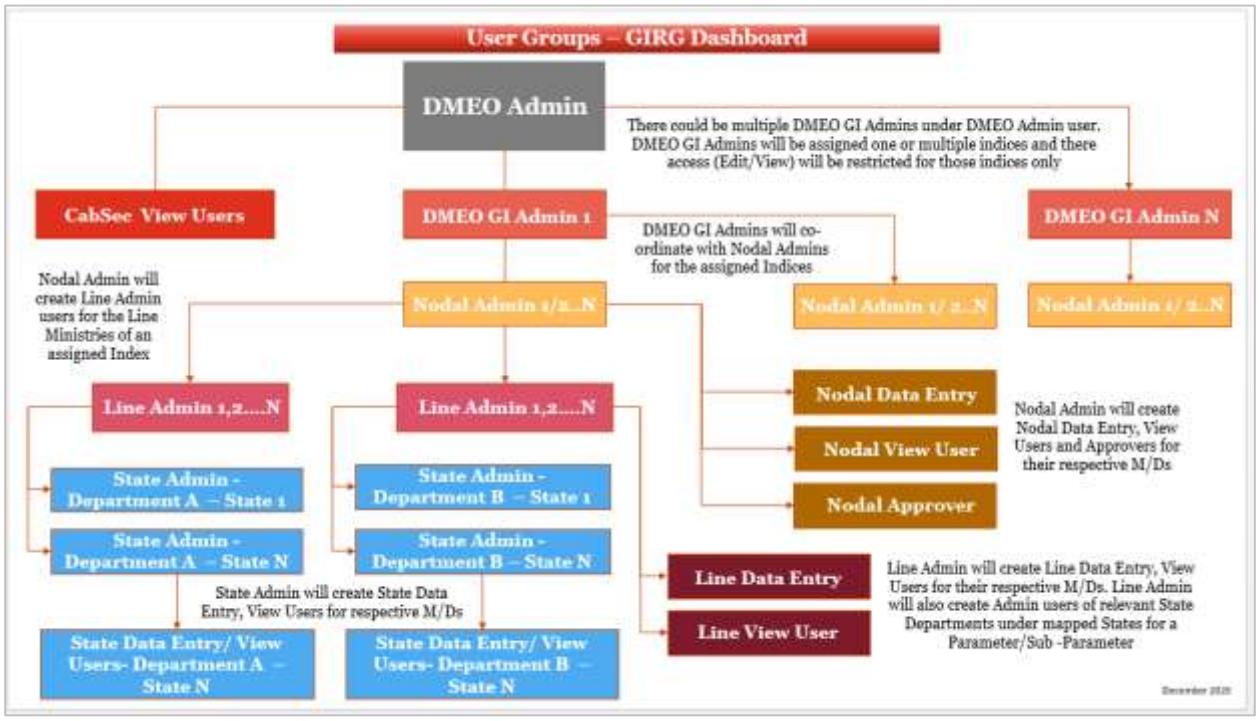


Figure 1-2

1.4 Key Modules of GI Dashboard

Following are the key modules of GI Dashboard;

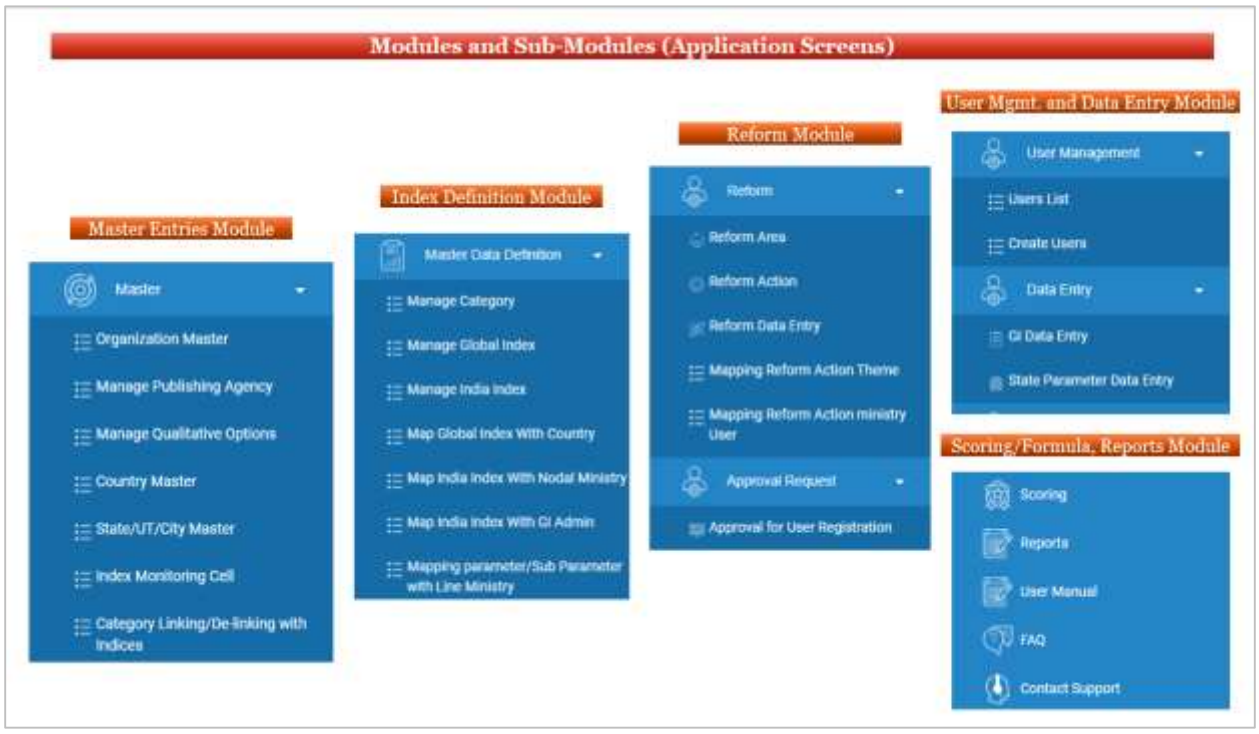


Figure 1-3

2 Formula Module

2.1 Index Tree Structure

You need to understand the Index Tree, the organization of themes and parameters under specific Index.

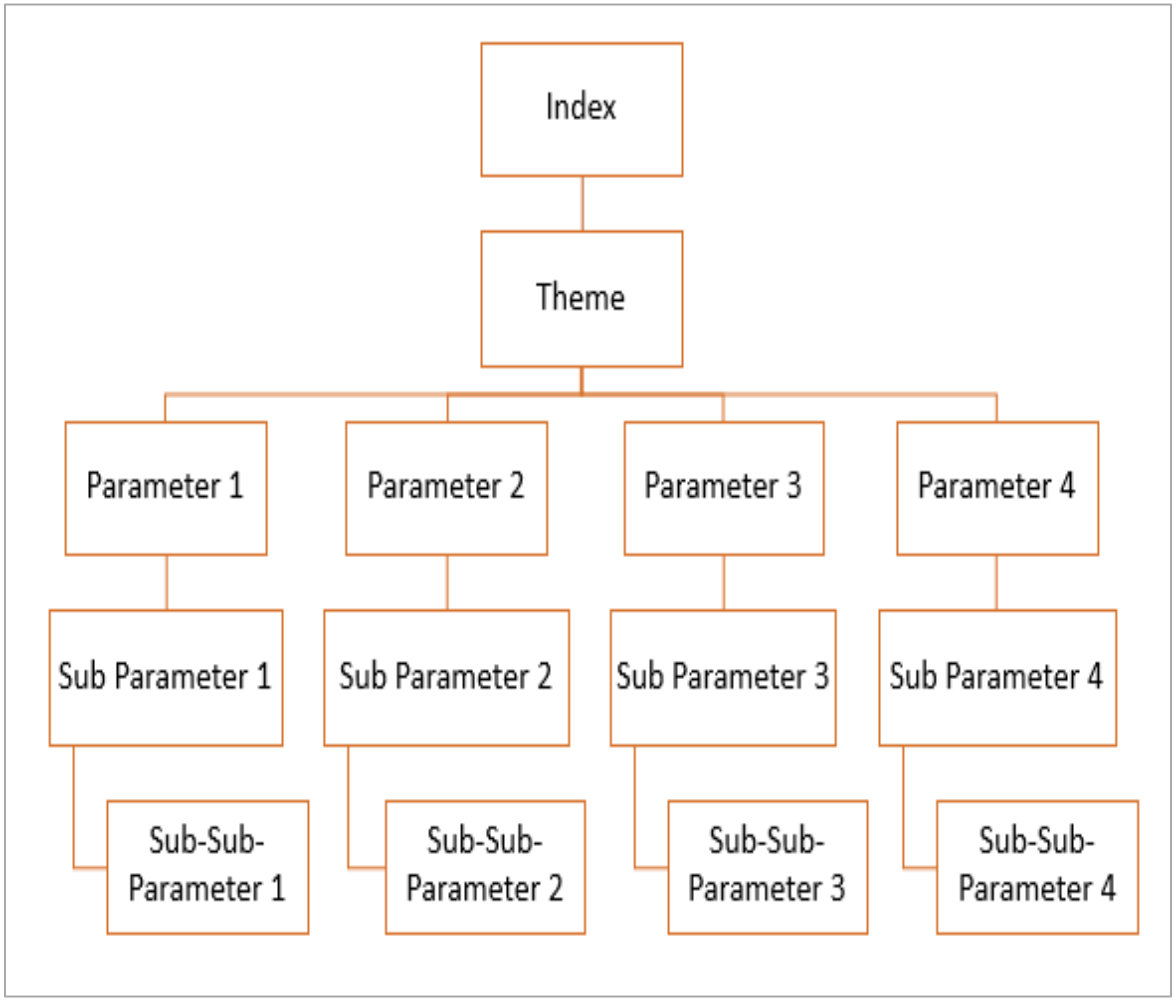


Figure 2-1

2.2 High Level Flow

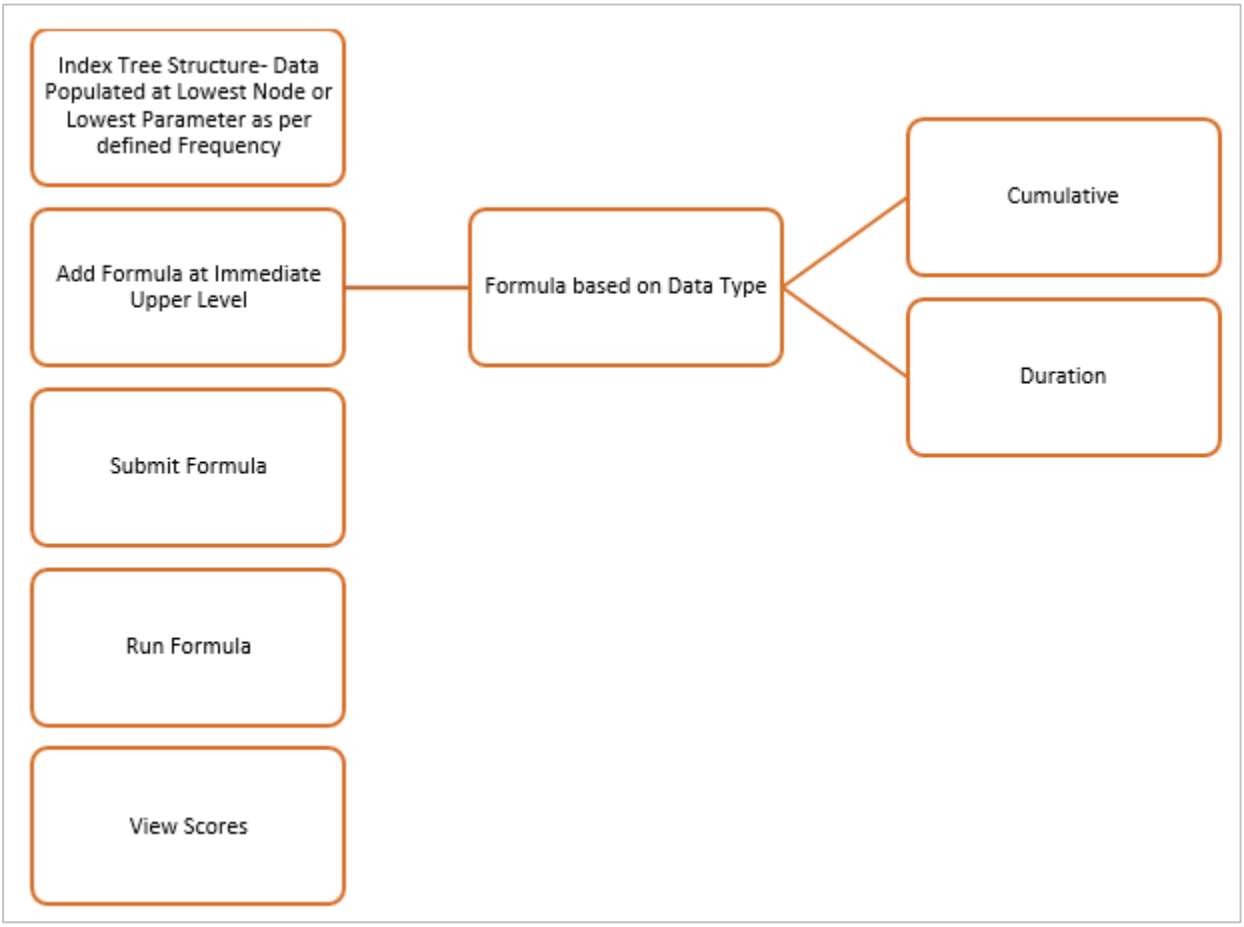


Figure 2-2

Note:

Formulae are defined for India Indices of type Formula base. India Indices, the lowest parameter will be mapped to Data Entry users at Nodal, Line/State Levels. Data is populated at the lowest level of Parameters under specific Index. Scores are calculated based on the Data populated at lowest level and the formula defined at node level.

3 Manage Formula-Steps

1) Select “Add Formula” at intermediate level on Index
2) Select the Parameter/sub-parameter (Select immediate or all Childs and click “Insert” to add the parameters to Operand Box. You can tick “Include Weight” checkbox to include the substitute weight and value defined at the Parameter level while creating the index. If included Weight, Substitute Weight, Substitute Value, defined at Index Node will be taken as sub weight and sub value where the data values are not populated at specific parameter level.
3) Now select the function to apply at selected level, user Functions/Number Pad and operations
4) Click “+ sign” to add more Operands
5) You can Add or Delete Operands
6) In case if you want to apply operation for all state levels select the statistical function on right hand side
7) Click “Insert” displayed next to Operand to insert the formula in Final Formula Box
8) Click “Submit” to submit the formula

4 Add Formula

Login with Nodal Admin Credentials.

Note:

Nodal admin defines Formula at all intermediate levels including Index level.

Select Formula >> Scoring from left menu;

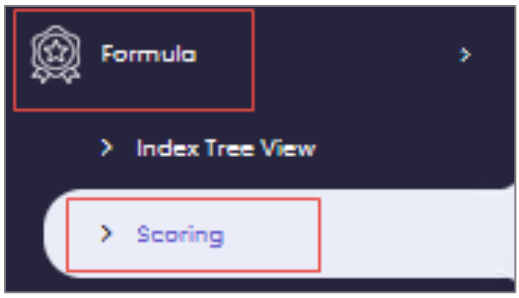


Figure 4-1

Existing India Indices will be displayed with following column headings:

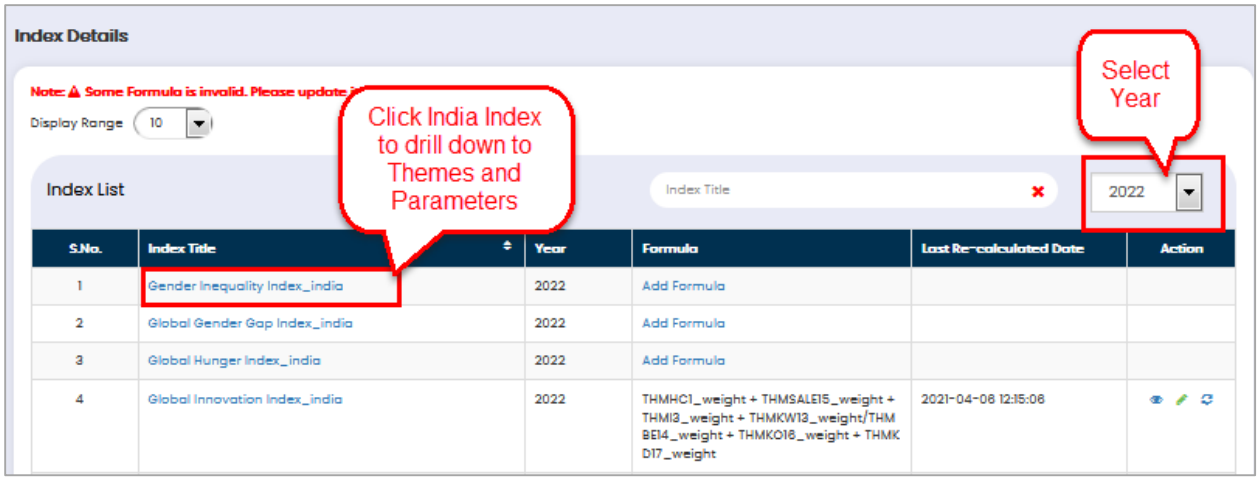
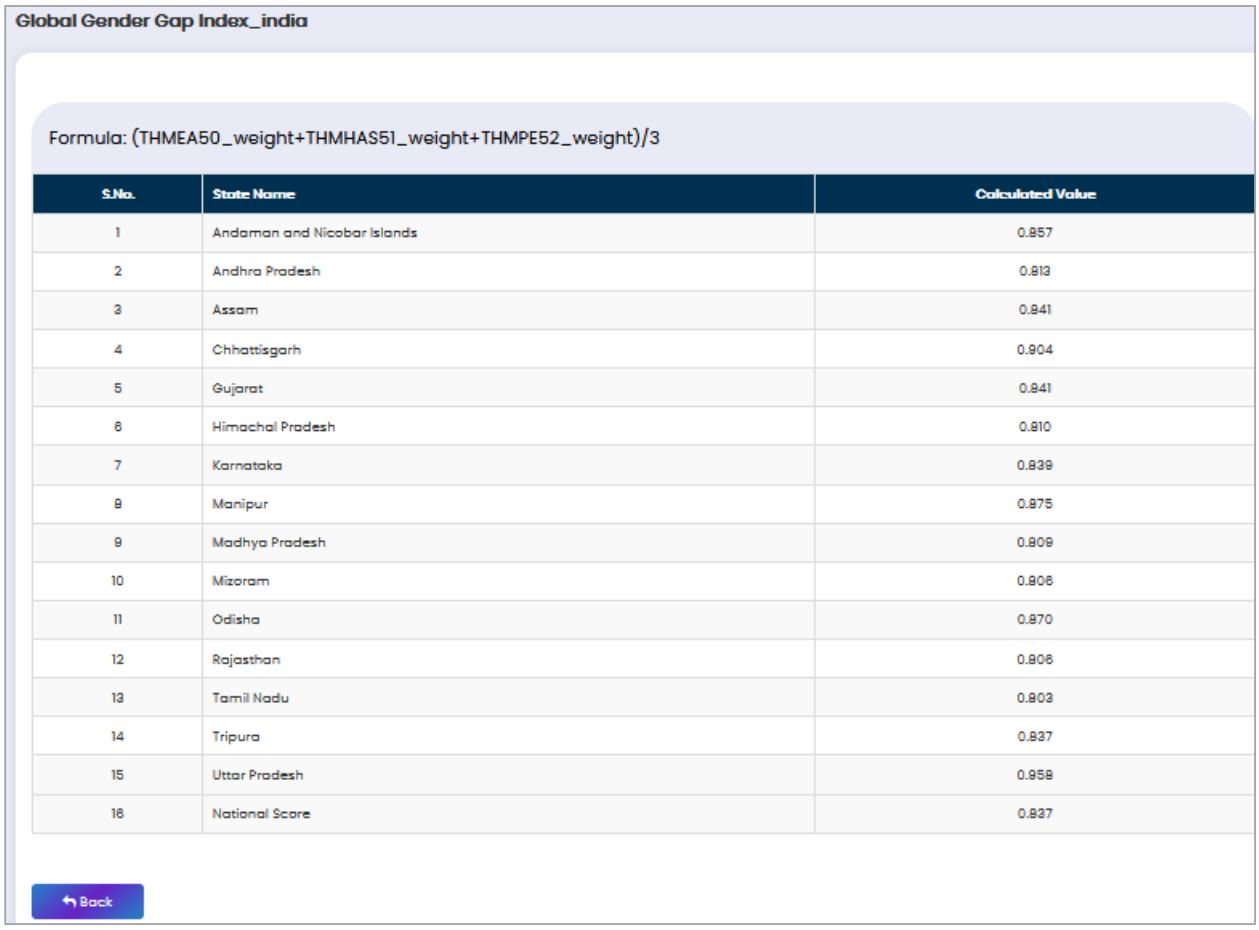


Figure 4-2

- S. No.
- Index Title
- Year
- Formula
- Last Re-calculated Date
- Action
  - View: Click to view the scores
  - Edit: Click to edit formula
  - Re-Calculate Formula: Click to refresh and recalculate the formula/score

4.1 View Scores

- Click on Index listing screen to view the scores;



Global Gender Gap Index_india

Formula: (THMEA50_weight+THMHAS51_weight+THMPE52_weight)/3

S.No.	State Name	Calculated Value
1	Andaman and Nicobar Islands	0.857
2	Andhra Pradesh	0.913
3	Assam	0.941
4	Chhattisgarh	0.904
5	Gujarat	0.941
6	Himachal Pradesh	0.910
7	Karnataka	0.939
8	Manipur	0.875
9	Madhya Pradesh	0.909
10	Mizoram	0.906
11	Odisha	0.870
12	Rajasthan	0.906
13	Tamil Nadu	0.903
14	Tripura	0.937
15	Uttar Pradesh	0.959
16	National Score	0.937

Back

Figure 4-3

Scores at selected level as per formula will be displayed.

Click 

to get back to listing screen.

4.2 Edit Formula

- Click on Index listing screen to edit formula;

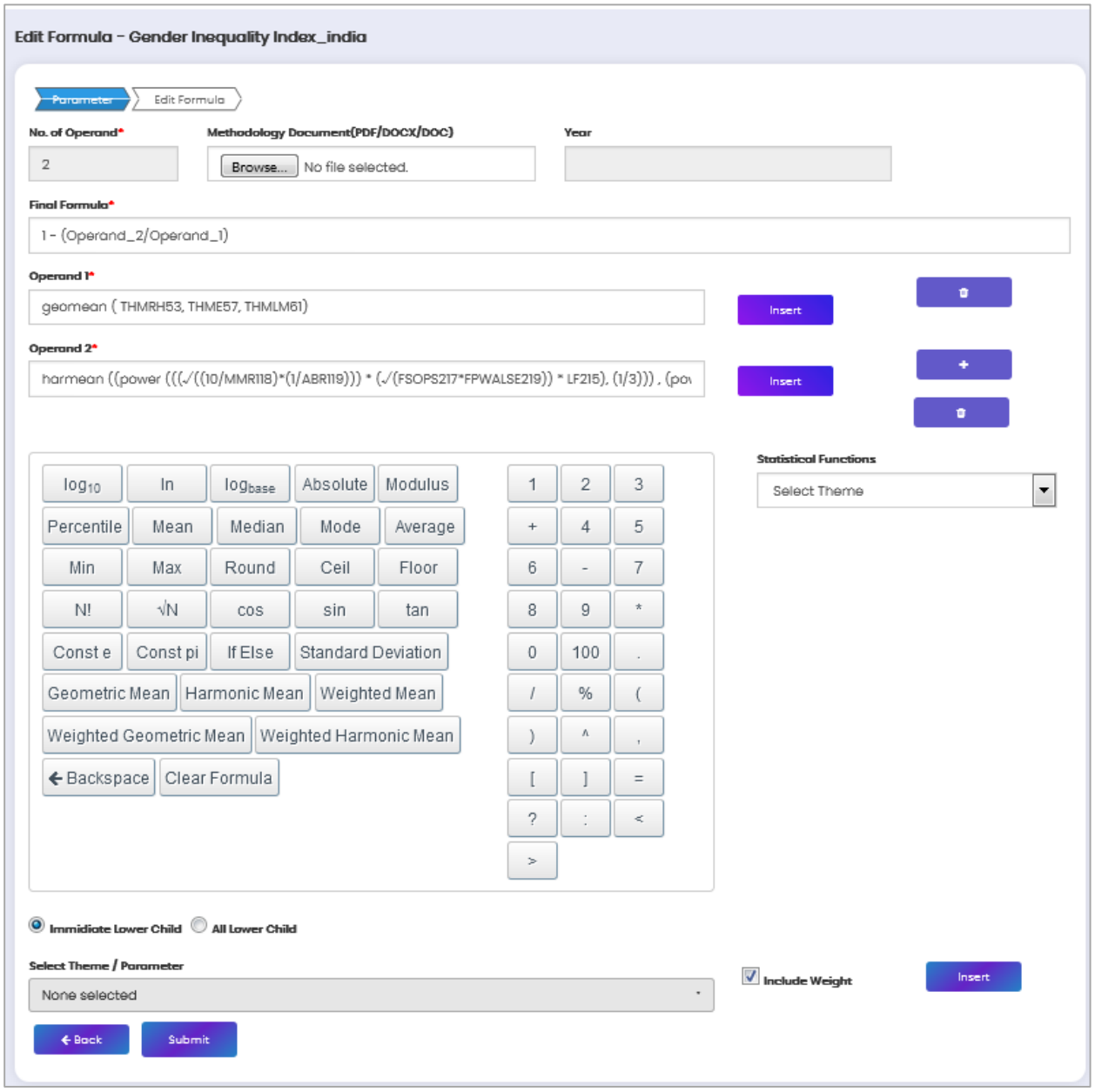


Figure 4-4

Edit required information and click Submit button.

4.3 Recalculate Scores

- Click on Index listing screen to refresh and recalculate the formula/score;
- Formula will be recalibrated as per the data values or parameter mapping as per latest changes in index and calculates the scores.

4.4 Add Formula

Data is populated at the lowest level of Parameters under specific Index.

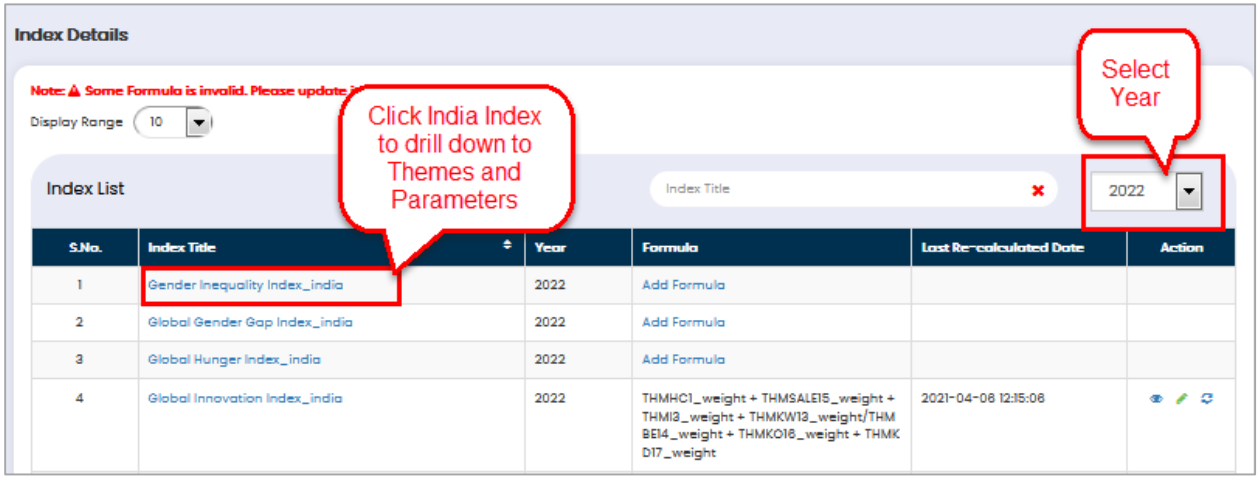


Figure 4-5

- Click Index Link to View Themes defined for Index

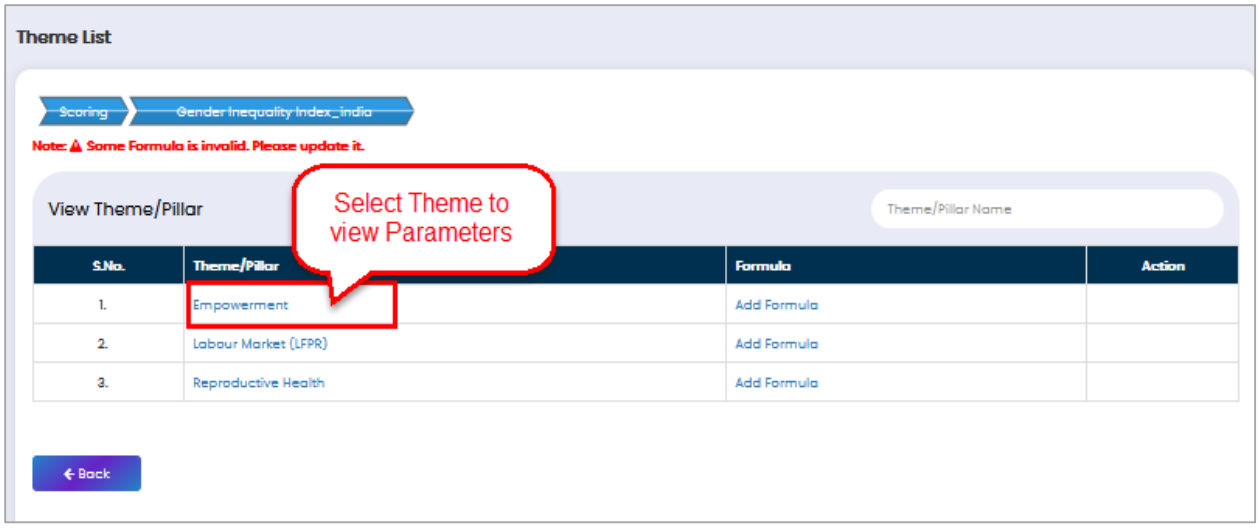


Figure 4-6

- Click Themes Link to View Parameters defined under Theme

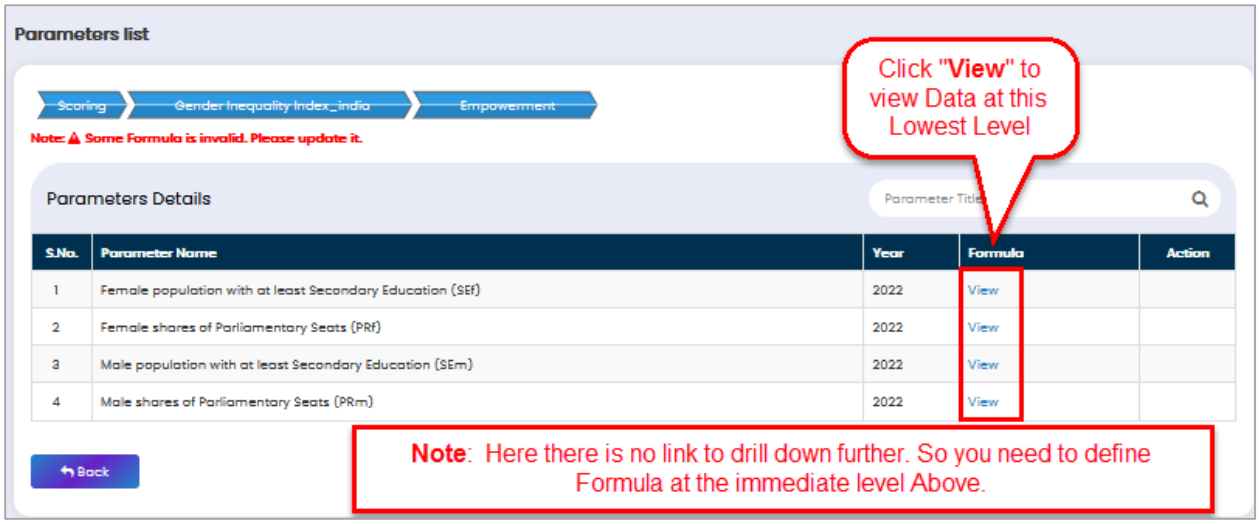


Figure 4-7

Here is no link to drill down further. So this is the lowest level of the Index tree where data is populated by the assigned users. Just above the lowest level we have the intermediate levels where formulas will be defined.

Start defining formula the immediate level above the lowest parameter.

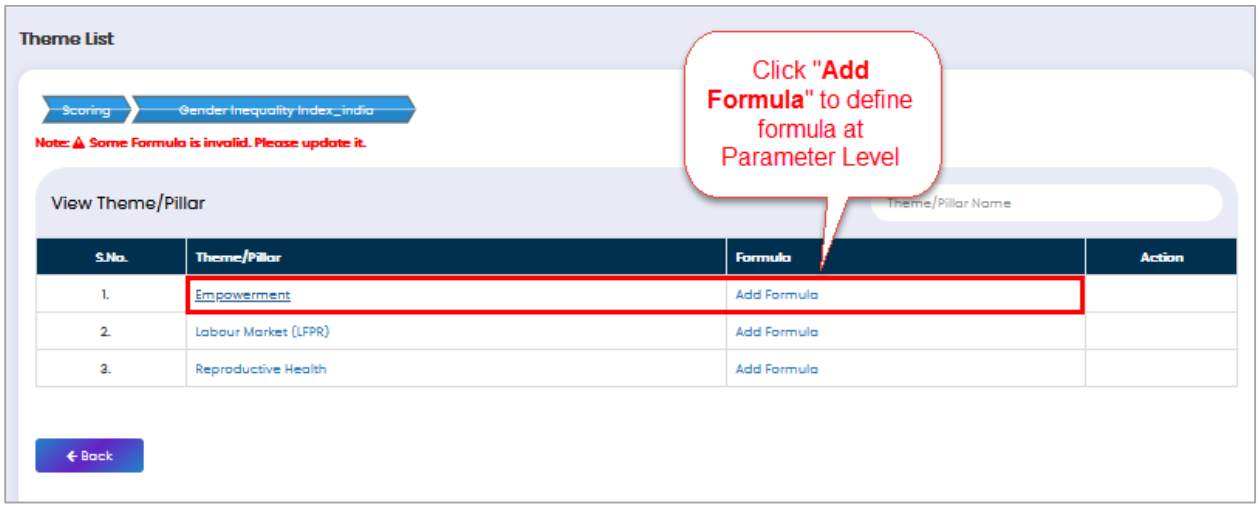


Figure 4-8

Click Add Formula to define formula at Parameter Level. Formula screen will be displayed.

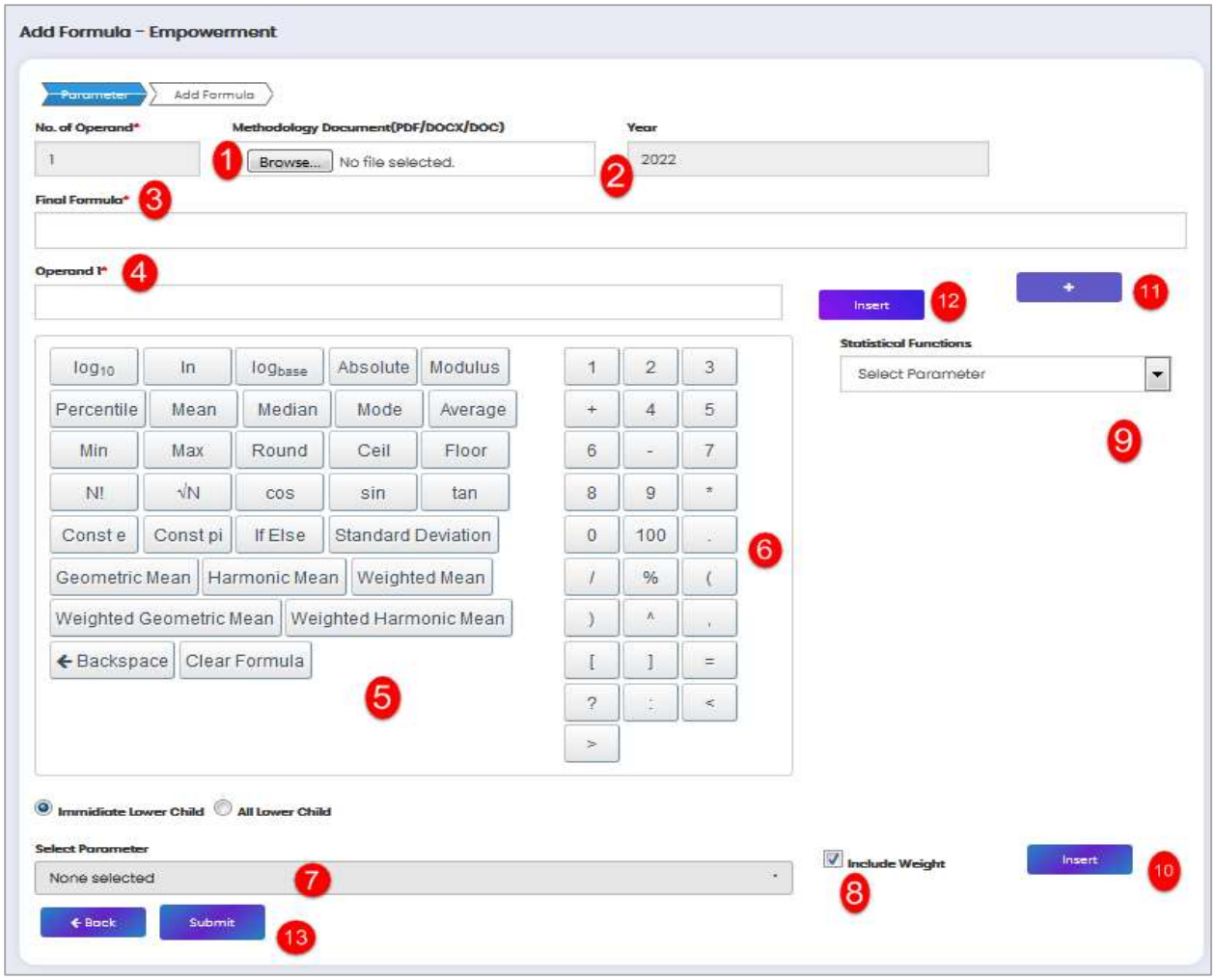


Figure 4-9

Enter following details:

(1) **Methodology Document**: Browse, you can upload Methodology Document designed by Publishing Agency, to enable the Nodal Administrators to refer, before defining formula.

(2) **Year**: Year for which you are defining the formula in disabled mode.

(3) **Final Formula Box**: where defined Formula appears.

(4) **Operand**: Call the parameters (or other index tree nodes like themes etc. along with functions to define formula. You can add more than one Operand by selecting + and select Insert to display the operand in Final formula box

(5) **Functions**: You can use these functions to define the formula. On mouse hover, the function displays the syntax for the function as shown below:

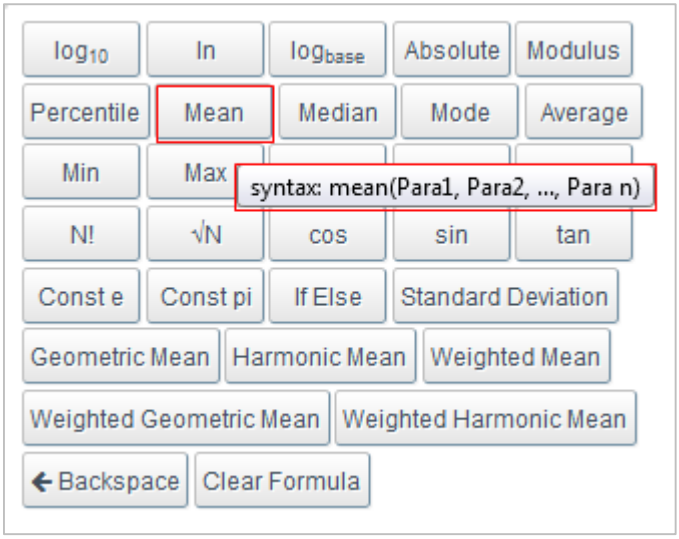


Figure 4-10

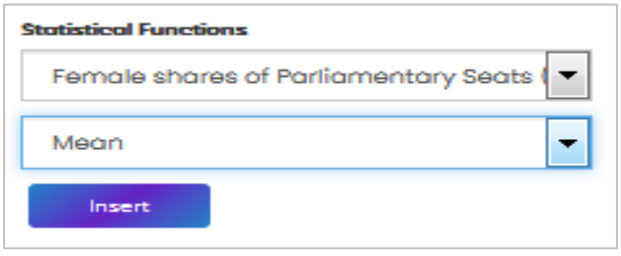
(6) **<u>Number Pad and Arithmetic Operations: Allows you to select the operations and numbers.</u>**

(7) **<u>Select Intermediate Child or All Lower Child</u>**: You can select the parameter, either single or multiple parameters. Prior to that select **Immediate Lower Child** OR **All Lower Child.**

Immediate lower child will show all the immediate Childs for selection. All lower child will show all the lower child till the lowest level coming under that particular node.

(8) If included **Weight then the** weighted value (Value * Weight) as per the weight defined for that par/sub-par in the Index definition will be considered.

(9) **<u>Statistical Functions:</u>** Statistical Functions displayed on right side, can be used to derive statistical equations on the selected lowest child. This will take values for all states mapped to the parameter and entered by data entry user at the lowest parameter level.



(10)To insert defined Operand into Final Formula Box

(11)To insert more Operands

(12)To insert the parameter(s) selected from dropdown list into Operand.

(13) Click Submit to submit Formula

View Scores:

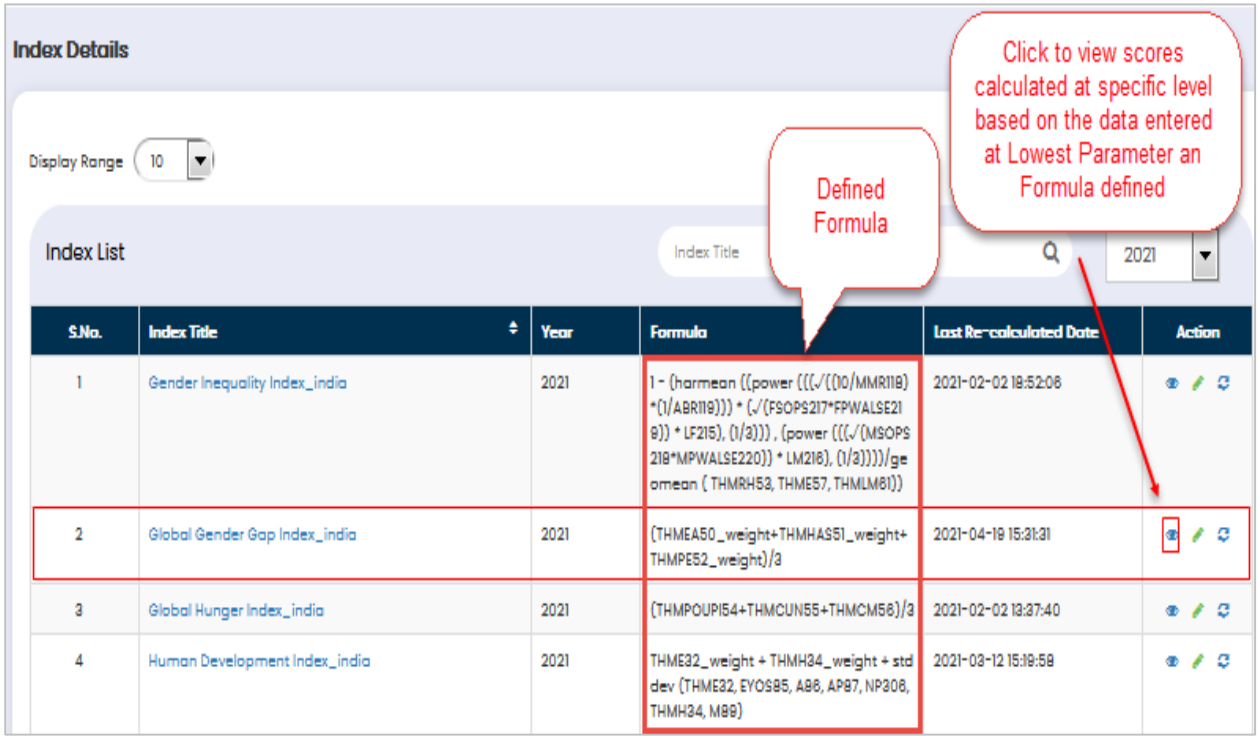


Figure 4-11

Defined Formula will be displayed under formula column;

It will give you state wise scores and national scores based on the state weights uploaded in the system:

- National Score can be defined as:
- Weighted average of all states
- Aggregate values of all states (Default)

Ministry can choose, the National Score formula. If they choose weightage average then they have to upload weights for all mapped states from here:

- Master Data Definition
- State Weights for National Score

***State wise score**:*

In formula based Index, depending on the geographic applicability (if States/UT), states are mapped at the lowest parameter (lowest node in the Index Tree).

For all intermediate levels above that, number of states mapped for a level will be defined as the union list of states mapped to all its parents.

***Example**: If a formula is defined to calculate the values at theme level. And there are two parameters defined below the Theme. (Parameter 1 and Parameter 2).*

The parameter 1 mapped with 2 states (S1, S2) and the parameter 2 is mapped with 3 States (S3, S4, and S5). Then if we run the formula defined at the Theme level then it will show scores for 5 states (S1, S2, S3, S4, and S5)

If the formula defined at the Theme level is simple summation (Parameter 1 + Parameter 2)

*Then – in the formula, Parameter 1 values will be directly taken for S1 and S2 from the values entered by the Data Entry users. However for S3, S4, S5, since these states are not mapped to parameter 1, values will not be entered by data entry user but Substitute weight * Substitute Value will be taken. For all nodes in the Index Tree, Substitute weight (Default value 0) and Substitute values (Default value 1) are defined in the definition page.*

5 State Weight for National Score

Login with DMEO credentials:

Select Master Data Definitions >> State Weight for National Score

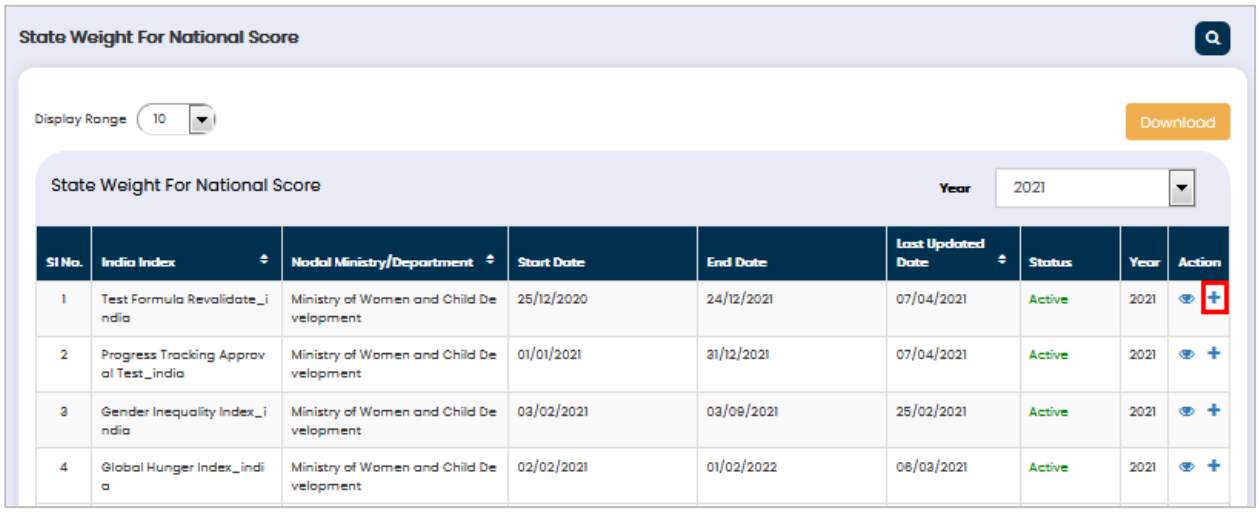


Figure 5-1

Click + to define state weight for National Scores;

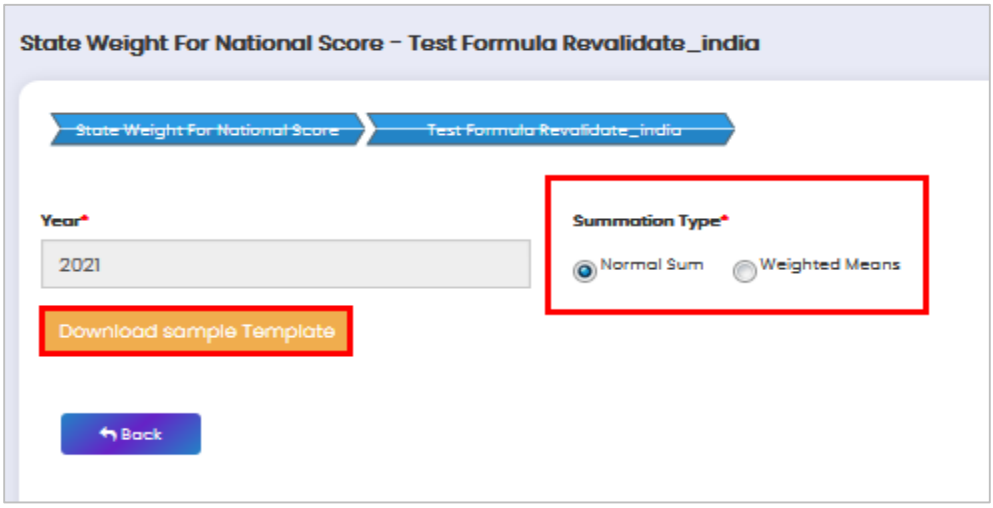


Figure 5-2

- Select summation type 

- Click 

to Download Template

- Click Import State Data to import state weight for national score
- Click Browse... to upload document. Uploaded data will be populated for the states

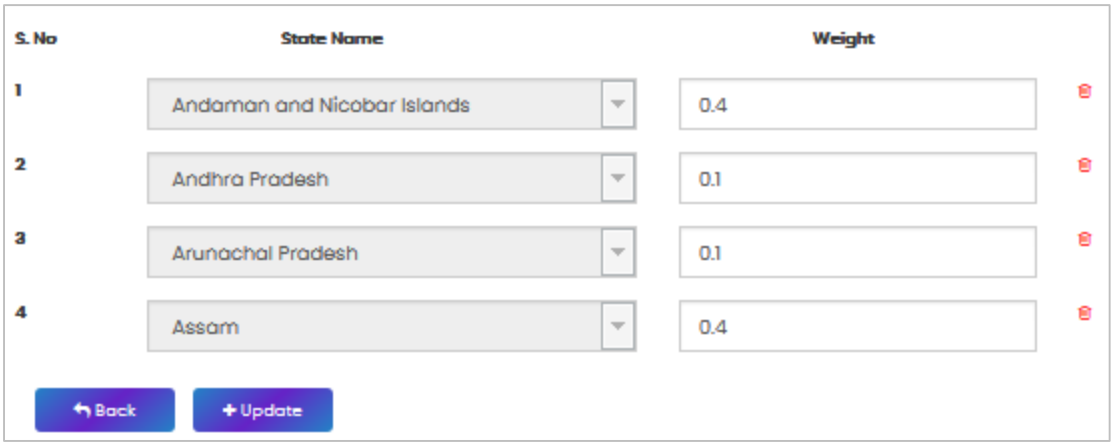


Figure 5-3

- Click + Update to save record

6 Visualization

Path: Dashboard Button on Logged-in Screen.

Figure 6-1

Select 

button on Logged-in screen.

Approved Scores and Ranks will be available under Visualization.

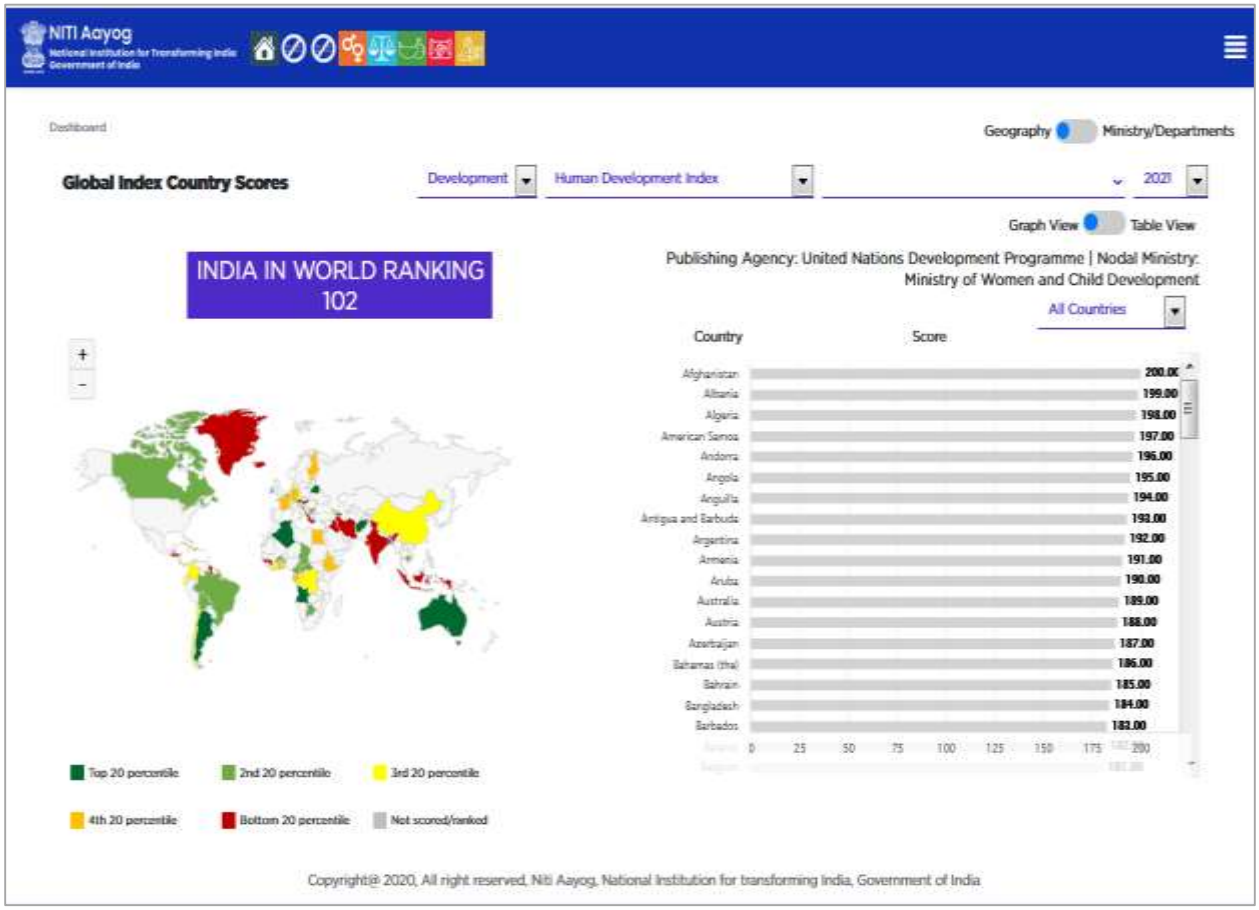


Figure 6-2

7 Exception Handling

There would be scenarios when value not entered by user or approved by user, so system handles such exceptions wisely as stated below:

7.1 Treatment of Data Not Reported

- If no entry has been made in the entire year, OR if entry has been made but not approved, apply the worst value as follows:
  - Quantitative increasing - assign Range Min.
  - Quantitative decreasing - assign Range Max.
  - Qualitative increasing - assign Lowest score
  - Qualitative decreasing - assign highest score
- If partial entry with approvals have been made, whatever captured so far will be considered
  - After end of the year (after the index period end date), assign worst values for blank fields in progress data entry and update scores accordingly
  - Data not entered will be captured in the compliance reports
  - Once year has ended, i.e. last date has been crossed, a notification can be sent to admin users that since progress data entry has not been updated, the worst score has been assigned

7.2 Normalization

- **Treatment of Denominator becoming zero or negative**:

  If in the denominator, Target =< min (for increasing), or target => max (for decreasing) then by default set normalized value to 100.

- **Treatment States overachieving targets:**

  Set normalized value to default value 100, i.e. if normalized value exceeds 100, cap it at 100

- **Treatment of National Geographic Applicability:**

  National vs. state parameters:

  - National normalization – Progress/Target
  - Data Definition

  E.g. P1, P2, P3 geographic applicability

  - P1 – State (S1, S2); substitute weight = 0, substitute value = 0
  - P2 – State (S1, S2); substitute weight = 0, substitute value = 0
  - P3 – National; substitute weight = 0, substitute value = 0

  Progress Data Entry

  - S1

- P1S1
- P2S1
- Not Applicable for P3

- S2
  - P1S2
  - P2S2
  - Not Applicable for P3
- National – Default progress value will be calculated by the dashboard. From the front-end Nodal Admin users will be able to:
  - Select if National progress values will be a weighted average or sum of state progress data, and states where the parameter is not applicable will be treated as "Not Applicable" next to them;
  - Upload weights for states that are mapped to that Index through excel upload;
  - Any other complexities in formula for National progress calculation would be configured from the backend.
  - After progress values have been calculated, Nodal Admins can override them. The system calculated value will remain frozen. Nodal Admins can opt to select "override progress value", and upon selecting that a separate textbox will be enabled to enter the new value. Once submitted, score calculation will be done on the basis of the new value.
  - Example: If a M/D selects "Weighted Average" and uploads weights for each state, the following would be how National progress values would be calculated for lowest Childs that are mapped to States/UTs/Cities
  - P1N = Wt. Avg (P1S1, P1S2) -> can be overridden by Nodal Admin in separate box
  - P2N = Wt. Avg (P2S1, P2S2) -> can be overridden by Nodal Admin in separate box
  - P3N direct entry by DE user

7.3 Formula for calculating State and National scores

- Since the requirement may vary from index-to-index, users can opt to choose a single formula for both state and national score calculation (as shown in example below), or if they can define separate formula for National and State score calculations
- Single formula

  E.g. Formula = (w1*P1 + w2*P2 + w3*P3)/(w1+w2+w3)
  - S1 score = (w1*P1S1 + w2*P2S1 + 0*0)/(w1+w2+0)
  - S2 score = (w1*P1S2 + w2*P2S2 + 0*0)/(w1+w2+0)
  - National score = (w1*P1N + w2*P2N + w3*P3N)/(w1+w2+w3)
- Double formula
  - Formula for state score
  - Formula for national score will be defined separately