



# cantor's world

## PLAYER'S MANUAL



United Nations  
Educational, Scientific and  
Cultural Organization



Mahatma Gandhi Institute  
of Education for Peace  
and Sustainable Development



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## ABOUT CANTOR'S WORLD

The actual decision-making involved in running a country is about finding the most efficient use of limited resources. The process of making a decision from the nearly infinite set of choices, with different combinations of inputs and outputs, makes it a nontrivial task. This is especially the case at the macro level where governments need to make decisions on investments for economic growth while ensuring high rates on return of these investments towards the Gross Domestic Product (GDP).

Traditionally, the focus of most governments has been to maximize GDP. Human well-being was understood as being synonymous with economic growth measured by income growth. And therefore, the question of sustainability was never an issue. This has, however, changed over the past few years. The increasing recognition of the finite nature of resources and the increasing attention to negative externalities accruing from economic activities has made it necessary for governments to address the sustainability dimension of economic activities. Equally important has been the recognition that just growth in income or GDP does not automatically contribute to well-being.

Hence, there is a need to make a distinction of what we want to measure. What do we mean when we say a country is growing? Can we say that a country is growing if the GDP is growing? Remember, GDP is the value of all final goods and services. So, it is a flow just as if an individual gets income at the end of every month if the person is working. Some might say that this is a good indicator to evaluate if the country is growing.

### Are there other indicators that one can use?

The Inclusive Wealth Model (IWM) developed by Partha Dasgupta and Ken Arrow offer a viable substitute for GDP to measure progress. The underlying premise of the Inclusive Wealth Index (IWI) is that the real progress of a country should be not based on the flow of income produced by the stock of capital a country is able to accumulate. We could have an indicator based on the stock of assets a country owns. The focus shifts from flow to stock. So, the important factor here is not the income per se generated in each

time period but the asset base or stock in each time period from which the income is generated. This also shifts the focus from the present to the future.

This raises a number of interesting questions that we must find answers if sustainability is to be also addressed:

**First, if GDP is the most appropriate indicator to measure the wellbeing of society?**

**Second, how do we ensure the sustainability of GDP if it is agreed among policymakers that it is a good measure or proxy for wellbeing?**

**Third, If GDP falls short of measuring wellbeing, then can the SDG's be used as a measure of wellbeing?**

**Fourth, do we need resources to achieve the SDG's and if yes, what measure can we use to track the use of resources?**

**Fifth, can the Inclusive Wealth Index (IWI) be a useful indicator to measure and track the use of resources?**

**Sixth, can we achieve the SDG's while at the same time ensuring a sustainable use of resources?**

To answer these questions, we have...

Cantor's World, one of the many learning products developed by UNESCO MGIEP. It is a simulation based game developed to understand the Inclusive Wealth Index, and to understand the uncertainties involved in governing a complex socio-economic system of a country. The game is targeted towards master's level students of economics and sustainability studies and mid-career policy makers. The participants play the role of the sole architect of the country and decide specific targets for their respective countries. The players then make changes to the various parameters in the game through specific policy interventions that are available as either monetary investment or regulatory change or providing subsidies.

The players' decisions affect the status of resources in the country and have a cascading effect on the produced, natural and human capital. The player's objectives in the game are both personal and global wellbeing. The facilitators of the game session are able to monitor the decisions and trajectories of the players in the game. Cantor's World is supplemented with well-defined learning outcomes including a curriculum framework with eight one-hour modules to direct the flow and usage in classroom setting.

# PLAYING THE GAME

## REQUIREMENTS FOR THE GAME

To play the game you'll require access to the internet and one of the following supported browsers: **Chrome** (or **Chromium**), **Firefox** or **Opera**. You will also have to enable cookies on your browser in order to play the game. We do not collect your personal information for any purpose.

Please login to the URL provided to you by the facilitator.

Welcome to Cantor's World. Please click on **Enter** to continue as shown in figure 2.1.



Figure 2.1: Landing Page

## LOGGING INTO AND OUT OF THE GAME

After your game facilitator has provided you with your credentials to play the game please ensure that your password is case sensitive and username in lowercase characters. In case you forget your password, please contact your facilitator. You can read more about Cantor's World by clicking on the Cantor's World logo.

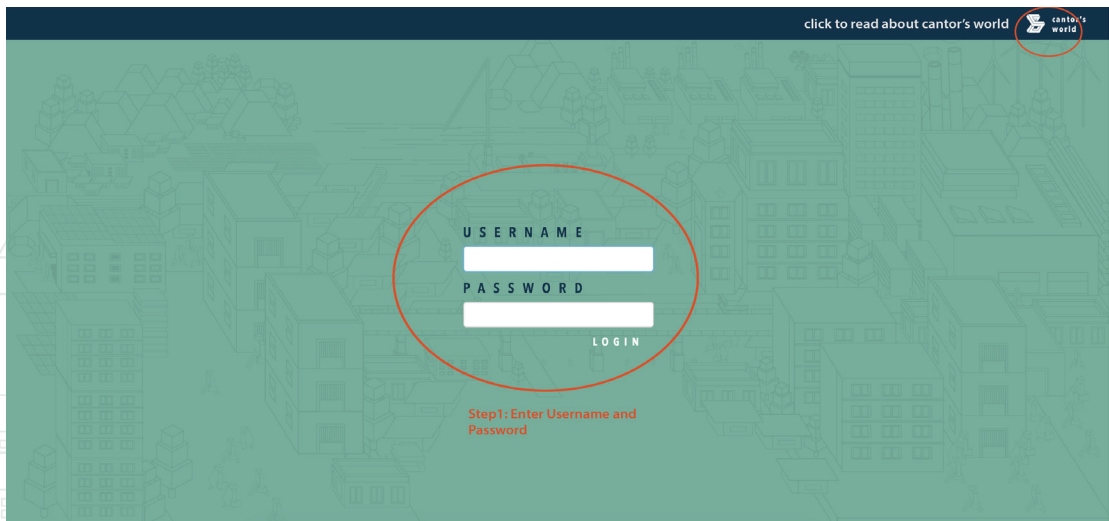


Figure 2.2: Login Page

After logging in successfully, you will see a list of instances available to you. Instances are actual games with a defined set of users. In case you are a part of multiple instances, please await instructions from your facilitator in order to select your instance.

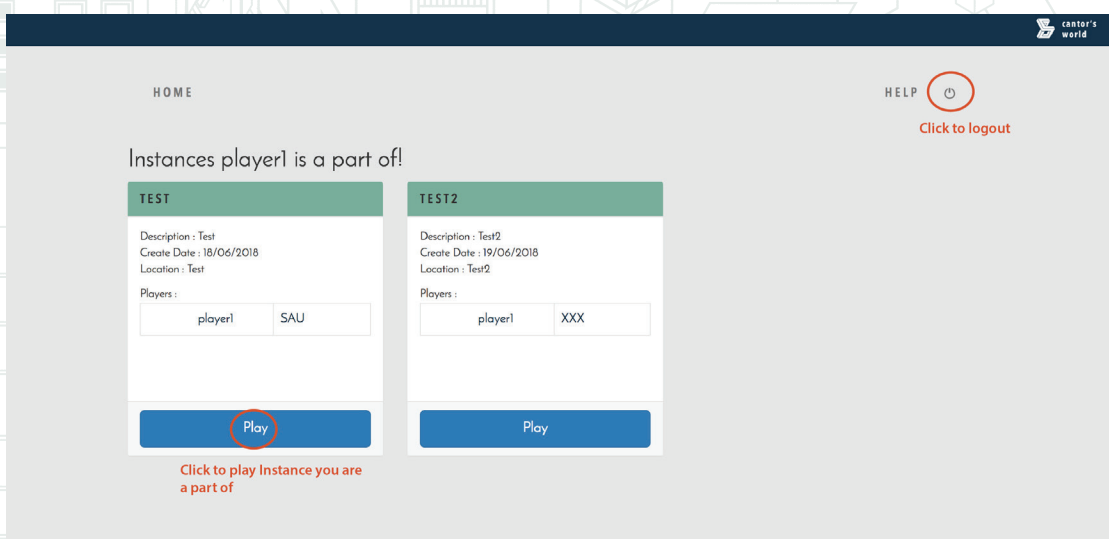


Figure 2.3: Game Instances Page

In figure 2.3 you will also notice the logout button which is available in every subsequent page from here on.

## GAMEPLAY

Select the instance you are supposed to play and look for the country assigned to you. If you have been assigned country XXX, then you are free to choose a country on your own. Please contact your facilitator to choose the country that you are assigned. You can now set the SDG priorities for your country by re-ordering the SDG blocks by clicking and dragging the button as shown in figure 2.4.

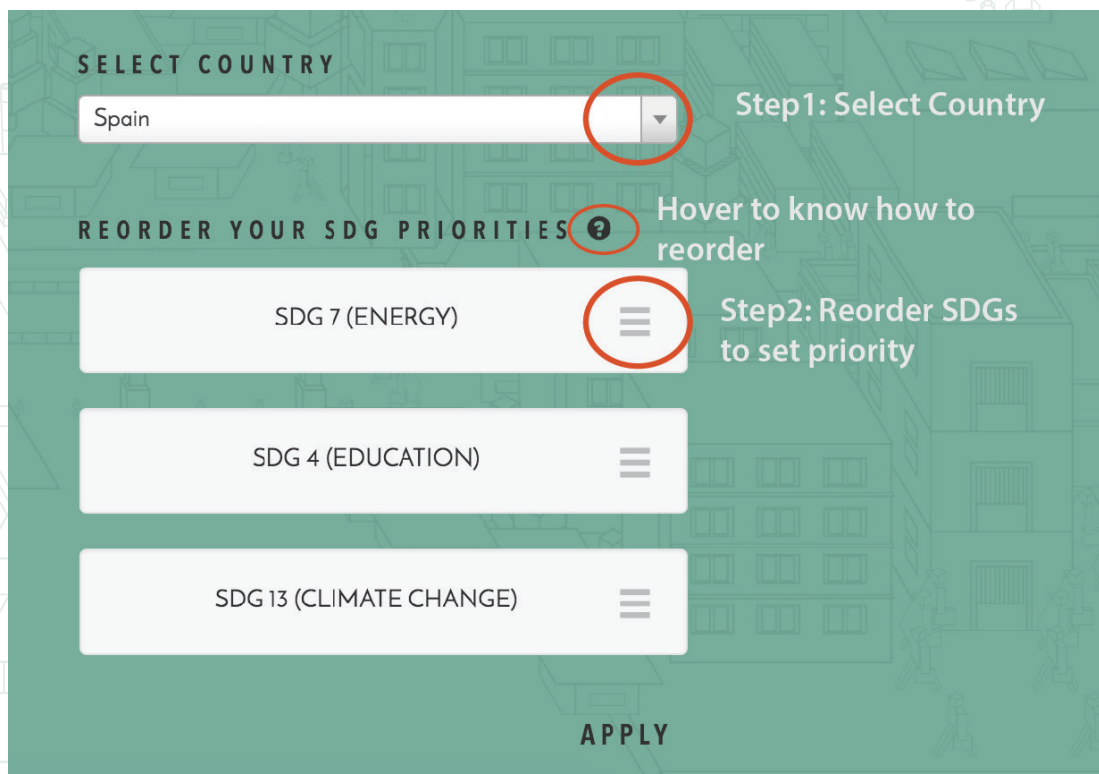


Figure 2.4: Set your SDG priorities and Country Page

Once you have set the priorities for your country, the button will be disabled for you. The facilitator will start the game after all participants have chosen their countries and priorities. If the button has not been disabled for you, please refresh the page. In case of any problem, please contact the facilitator.

## ADOPTING POLICIES

The screen that you now see is the Gameplay page. You can view the various policies your country has to offer for the year. To adopt a policy, you need to click on the arrow next to the name of the policy that you wish to implement (as shown in figure 2.6). You will notice that the two panels to your right are now populated with information. The information panel in figure 2.5 has the policy description and action plan contains the policy action.

The screenshot shows the 'Gameplay page' interface. On the left, there is an 'ANNUAL BUDGET (\$M)' section with a value of 12,972.99 and a list of capital types and their values. The main area is titled 'Where player implements policies' and contains 'INVESTMENTS' (IMPLEMENTED and AVAILABLE) and an 'ACTION' panel. Annotations include: Step 1: Click on the arrow to view policy (pointing to the Education arrow); Step 2: enter investment value for the selected policy (pointing to the 'Your Investment (\$M)' input field); Step 3: Click on implement button (pointing to the 'Implement' toggle); Step 4: Click to adopt policy (pointing to the 'Adopt' button); Step 5: Click to view investment in policy (pointing to the 'Irrigation' info icon). A 'Submit policy implementations for 1993' button is also highlighted.

Figure 2.5: Gameplay page

In the policy action figure 2.7, you need to follow steps 2 and 4. First enter your policy investment and ensure that your investment is less than the maximum investment. Also keep in mind your budget as shown in the left panel in 2.5.

After implementing all the policies for the year, click on "submit policy implementation for the year" as shown in figure 2.6 in Step 5.

This close-up shows the 'INVESTMENTS' section with 'Irrigation' in the implemented list and 'Education' in the available list. The 'Submit policy implementations for 1993' button is highlighted with a red circle. An annotation says: 'Click after chosen policies have been implemented for the year'.

Figure 2.6: Submit button on action page

This close-up shows the 'ACTION' panel. It includes an 'Implement' toggle, 'Your Investment (\$M)' input field (set to 0), and 'Max Investment (\$M)' input field (set to 270.0). The 'Adopt' button is highlighted with a red circle. Annotations include: Step 2: enter investment value for the selected policy (pointing to the 'Your Investment (\$M)' field); Step 3: Click on implement button (pointing to the 'Implement' toggle); Step 4: Click to adopt policy (pointing to the 'Adopt' button).

Figure 2.7: Policy action page

After all the countries from your instance have submitted their policy, the facilitator will move all of you to the next year. Please wait patiently while this happens.

## VIEWING DATA

To view the data of your country, please click on the Data tab on the navigation panel, which leads to a screen as shown in the figure 2.8. You can now select the years available to you and click on the generate button.

Figure 2.8: Data form on data page

1991 Indicator Values		1992 Indicator Values	
Produced Capital	\$ 298,612,050,535.92	Produced Capital	\$ 301,702,376,274.60
Depreciation Rate for Produced Capital	0.00	Depreciation Rate for Produced Capital	0.00
Initial Capital	\$ 120,580,787,897.56	Initial Capital	\$ 120,580,787,897.56
Investment	\$ 29,451,141,382.17	Investment	\$ 30,069,615,520.22
Produced Capital Multiplier	2.10	Produced Capital Multiplier	1.99
1991 Investment Value		1992 Investment Value	
Education Attainment	↑ \$ 5.00 million	Investment	↑ \$ 100.00 million
Investment	↑ \$ 5.00 million		

Figure 2.9: Data form on data page

The indicator data is from the years and capital chosen and the investment data is based on the policy investments made. You can also view the different policies implemented by you in the various years.

You may check on the progress of your country by clicking on the SDG page, by clicking on the SDG button on the navigation panel.

SDG	DESCRIPTION
SDG 4	Ensure inclusive and quality education for all and pro
SDG 7	Ensure access to affordable, reliable, sustainable and
SDG 13	Take urgent action to combat climate change and its

Figure 2.10: SDG page

## VIEWING GRAPHS

To generate the graphs for the various capitals and indicator data, click on the graphs button on the navigation panel. This leads you to a screen as shown in figure 2.11. Follow Steps 1-3.

You'll be shown three sets of graphs, the first is a comparison of the two indicators chosen and the other two graphs display the data across various years. The legend is available on all the graphs and one set of lines is a plot of the actual real world data and the other is the data of the path your country has taken.

If you would like to view only one indicator, set both characters as the same indicator.



Figure 2.11: Graph page

## SWITCHING BETWEEN INSTANCES

You can reach the list of instances page as shown in figure 2.3 by clicking on the country flag as shown.

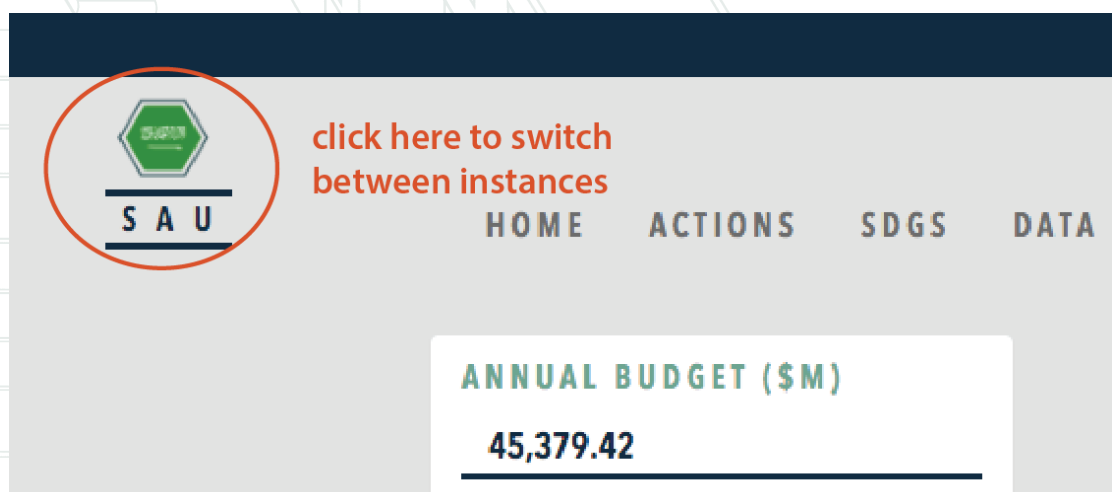


Figure 2.12: Click on the country flag to switch instances

## GETTING HELP

In case of receiving any Server Errors, please Refresh the page. In case the problem persists or you need to escalate an issue, then please contact your facilitator with a screenshot of the issue.

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For more information  
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