



# Assessing economic impacts of Covid-19 through input-output modeling tools

Webinar, 16 July 2020

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# Agenda

16 July 2020, 2pm – 3:30pm CEST		
1.	Introductions and Agenda	Sebastian Homm, GIZ
2.	Introduction to ICR Facility	Stefanie Khan, ICR Facility
3.	Assessing economic impacts of Covid-19 through input-output modeling tools	Ulrike Lehr & Christian Lutz, GWS
4.	Q+A / discussion	All
5.	Remote Assistance Application Process (1-on-1-clinics)	Stefanie Khan, ICR Facility
6.	Conclusion	Sebastian Homm, GIZ

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# Investment Climate Reform (ICR) Facility

<b>Funding</b>	11th EDF under the ACP-EU Partnership Agreement, together with BMZ and BC
<b>Objective</b>	Support the countries and regional institutions in Africa, Caribbean and Pacific countries in their public-private dialogue process to create a more conducive and sustainable investment climate.

## Technical assistance with up to 90 days for interventions:

- **Business Environment Reform** 
- **Business Environment for Sustainability** 
- **Public-Private Dialogue (PPD)** 

## Requests must:

- aim at improving the business and investment climate in an ACP country
- be part of a wider strategy, reform process, or PPD mechanism
- involve a PPD component 
- handed in by governmental organisations, business associations, development financial institutions (DFIs), and EU delegations in ACP countries

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# Assessing economic impacts of Covid-19 through input-output modeling tools

Ulrike Lehr & Christian Lutz

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# Introduction

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GWS- Lehr-Lutz-IO Approach



# The pandemic

## Situation in numbers (by WHO Region)

Total (new cases in last 24 hours)

<b>Globally</b>	9 843 073 cases (189 077)	495 760 deaths (4 612)
<b>Africa</b>	278 815 cases (10 713)	5 785 deaths (112)
<b>Americas</b>	4 933 972 cases (117 178)	241 931 deaths (3 169)
<b>Eastern Mediterranean</b>	1 024 222 cases (17 943)	23 449 deaths (485)
<b>Europe</b>	2 656 437 cases (16 586)	196 541 deaths (352)
<b>South-East Asia</b>	735 854 cases (25 399)	20 621 deaths (482)
<b>Western Pacific</b>	213 032 cases (1 258)	7 420 deaths (12)

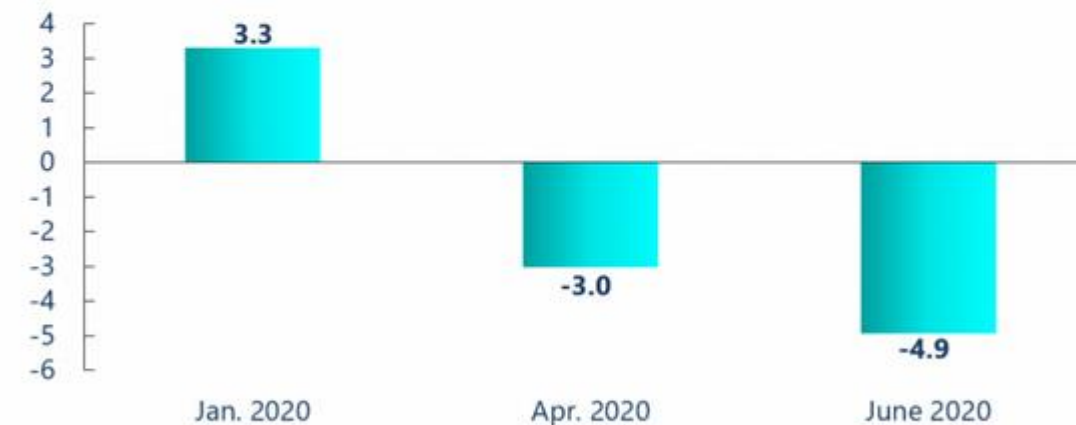
Data as received by WHO from national authorities by 10:00 CEST, 28June2020

The pandemic claimed almost half a million lives and carried health systems globally beyond their limits. The pandemic was harnessed by global lockdown which has triggered a global recession.

## A deeper recession

The Great Lockdown has triggered the worst recession since the Great Depression.

(global real GDP growth, 2020, year-on-year percent change)



Source: IMF, *World Economic Outlook*.

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# Possible support from economic analysis

- International institutions provide data and assistance
- Domestic institutions want a quick overview of effects, adjustable, easy to use.
- Use the economic Input-Output (IO) framework for a first over-view of effects.
  - IO analysis can capture supply and demand shocks in their structural effects
- Helps to
  - better understand what is happening,
  - better design policies and to
  - enrich consultations during and especially immediately after this phase.



# Descriptive analysis of MyCountry

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# MyCountry

- To illustrate the benefits of the approach, we will use an example.
- This is an Input-Output table.
- It comprises all sectors of an economy (in our example 3: agriculture, manufacturing, services), final demand at home and from abroad, imports and value-added, which covers profits, taxes and wages

		Demand					Sum
		Agriculture	Manufacturing	Services	Consumption	Investment	
Supply	Agriculture						
	Manufacturing						
	Services						
Value added							
Imports							
Total Output							

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# MyCountry

- This is the same table with numbers
- Darker blue shows supplies of sectors to each other
- Symmetric, the **sums along the rows** must be equal to the **sums along the columns**

		Demand						Sum
		Agriculture	Manufacturing	Services	Consumption	Investment	Exports	
Supply	Agriculture	37	59	141	81	21	32	370
	Manufacturing	133	132	37	123	103	62	590
	Services	86	128	43	291	61	31	640
Value added		95	222	389				705
Imports		20	50	30				100
Total Output		370	590	640	495	185	125	2405

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## What does the table tell us?

- In MyCountry services contribute 40%, agriculture contributes 23% and manufacturing contributes 37% to total output.
- It is an economy which imports little, and exports little
- The main use lies in consumption
- The economy is highly interdependent
- Agriculture
  - supplies >60% to other sectors
  - buys a lot from manufacturing
  - Highly automatized

		Demand						Sum
		Agriculture	Manufacturing	Services	Consumption	Investment	Exports	
Supply	Agriculture	37	59	141	81	21	32	370
	Manufacturing	133	132	37	123	103	62	590
	Services	86	128	43	291	61	31	640
	Value added	95	222	389				705
	Imports	20	50	30				100
Total Output		370 (23%)	590 (37%)	640 (40%)	495 (61%)	185 (23%)	125 (16%)	2405

# Descriptive analysis can be used to determine vulnerability

- High share of consumption in the economy
  - increases vulnerability for demand shocks.
- Relevance of exports
  - increases vulnerability for global demand shocks
- Dependence on tourism
  - enhances vulnerability to travel bans
- Energy import or export dependence
  - maybe reap the benefits of low energy prices
- Electricity import dependence
  - potential strain in the electricity system from contracted quantities no longer needed
- Small-scale farmers (subsistence), depend on local markets and ease of travel
  - Lockdown hits these vulnerable groups most.

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# IO analysis of COVID19

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# Input Output Analysis

## Economic tool for the analysis of direct and indirect effects

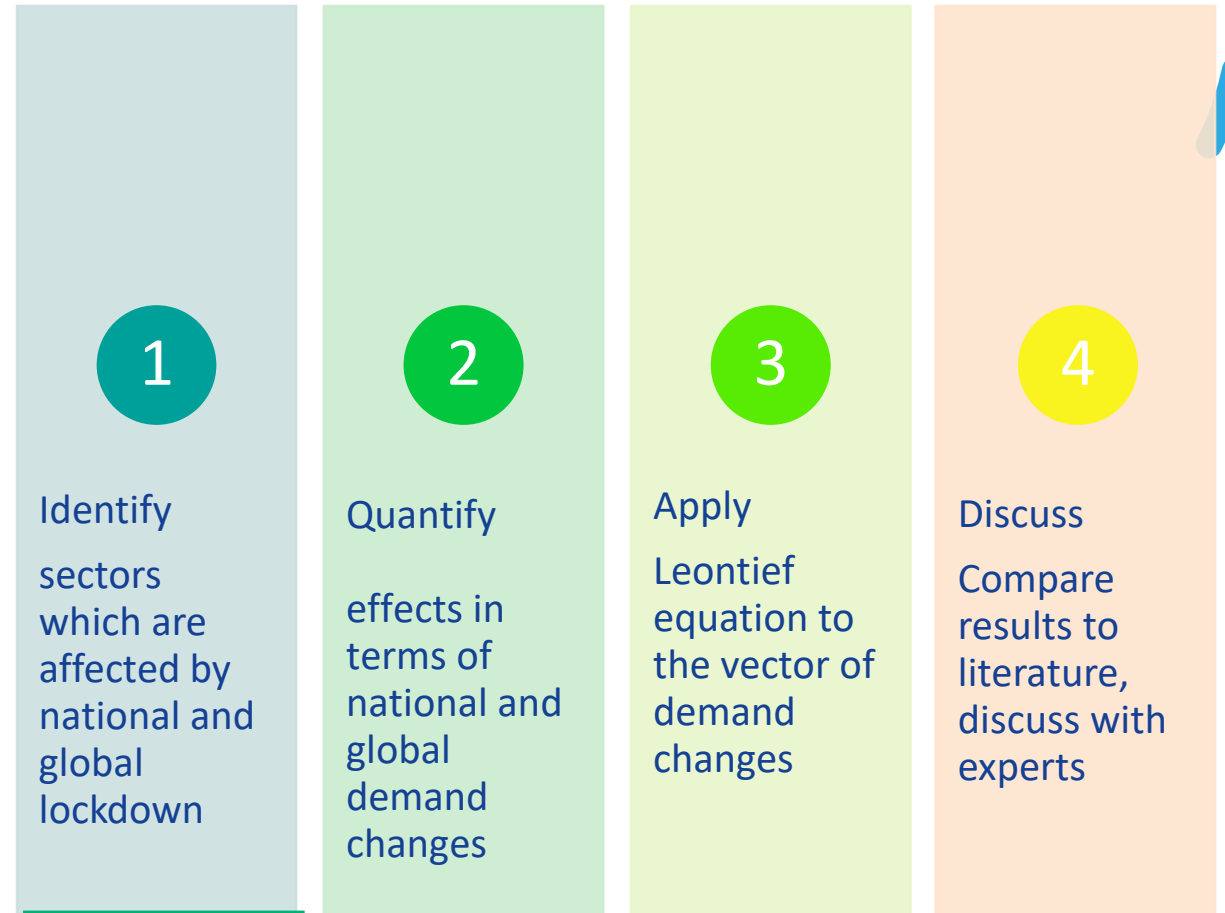
- Goes back to Wassily Leontief (Nobel prize 1973)
- Input-Output Tables are available for more than 100 countries in the world
- Consistent analytical framework to estimate effects of economic shocks on output, gross value added, employment and GDP
- Maps direct effects and indirect effects
- Allows for deep insights into economic structure effects

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## Focus on sectors

- Focus on damages, losses by sector
- Understand vulnerabilities by sector
- Prioritize sectors for recovery/support measures

# IO analysis – stepwise approach



# 1. Identify: Sectors affected by pandemic – example Georgia

- Travel restrictions /lockdown:
  - National
    - Decrease in demand for
      - Transport
      - Restaurants (business lunch as well as leisure)
      - Retail
      - Administration
      - Fuel, durable consumption goods
  - International
    - Tourism
    - Migrant workers: construction to Russia
    - Migrant workers: health, age care to EU; Israel
    - => losses of remittances
      - Interruptions in the value chain
- Tourism decreased from abroad and domestically





## 2. Quantify

### Indicators for lockdown effects

- Tourism: number of tourist arrivals in same period before lockdown
- Trade: lockdown in partner countries, order level, exchange rate
- Retail: Turnover in same period before lockdown
- Note: some consumption can be made up (clothes, books etc.), some not (restaurant visits)

### Sources

- Statistics (monthly, weekly data)
- Literature
- Surveys

# 3. Apply – results

- Findings for Georgia  
a growth rate of real GDP in 2020 of -4.5%.

- The results compare well with the literature.
- They add insights regarding sector employment, sector specific losses and indirect effects.

## 4-5% REAL GDP DECLINE FOR GEORGIA IN 2020 CAN BE DEEMED AS A CONSENSUS PROJECTION

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Publication date	February	March	April	May	
<b>Global growth projections</b>					
Citi Research	1.3%	-1.6%			
Mckinsey	1.0; -1.5%	-1.5; -4.7%	-1.8; -5.7%	-1.5; -4.7%	-2.7; -6.5%
Fitch	1.3%		-1.9%	-3.9%	
Moody's		-0.5%		-4.0%	-4.0%
S&P		0.4%			-2.4%
IMF				-3.0%	
<b>Georgia's growth projection</b>					
TBC Capital	1.7; 2.5%*				-4.5%*
ADB		0%			
RENCAP		-0.5%			-2.9%
Galt & Taggart	3.0%		-3.5%**	-4.0%	
Sberbank			-4.2%		
World Bank			-0.2; -2.0%		
IMF				-4.0%	
NBG					-4.0%
MOF				-4.0%	
EBRD					-5.5%

\* Baseline scenario  
 \*\* Probability weighted average of three scenarios  
 Source: Respective institutions

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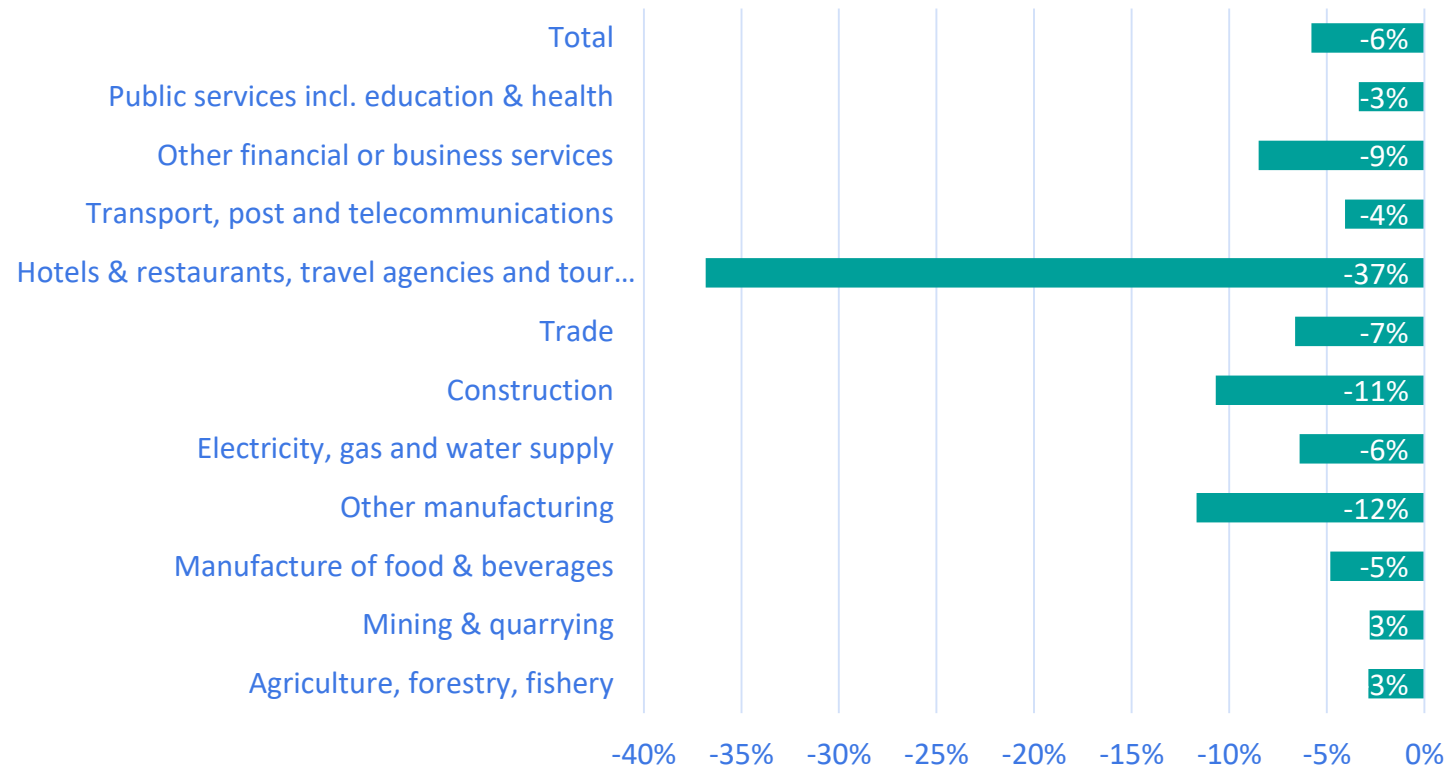


### 3. Apply – sector specific results

A sector specific analysis adds insights regarding sector employment, sector specific losses and indirect effects.

Helps target recovery measures at vulnerable groups

- Relative loss is largest in tourism related sectors
- Absolute loss in agriculture is second highest, but relative loss small
- Manufacturing losses are in relative terms above average
- Construction losses also are well above average



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# How about recovery?



The screenshot shows the IMF website's navigation bar with the IMF logo and search icon. Below the navigation bar is a blue banner with the text "POLICY RESPONSES TO COVID-19" and a background image of a globe with circuitry. Underneath the banner are two columns: "Related Links" with a link to "IMF and COVID-19" and "Policy Tracker" with a "Browse by Country" section containing a list of letters from A to Z.

Recovery measures globally often address:

1. Tax breaks
2. Loans
3. Subsidies
4. Investment support

- Full model
- IO quick approach



# Example agriculture in Georgia

- Effects of investment in equipment → demand change in IO logic
- Effects of improved production technology → change of coefficient/technology in IO logic
- Introduction of international standards → increase of exports in IO logic



**150** liters of diesel fuel  
Discounted price per 1 ha  
Diesel Fuel Price 1 l - 1 GEL



**2 000** GEL per 10 ha  
**200** GEL per 1 ha  
Agro card



**75** GEL per 1 ha  
Amelioration



## Taking Care for Village



**Up to 80%**  
Grant for Dairy Sector



Co-financing purchasing / installation of irrigation system for perennial crops



**50%** Grant for  

- Technical Equipment
- Greenhouses
- Irrigation Systems



**Up to 17%** Co-financing of loans  
Banks offering new conveniences



**70%** Co-financing of  
Agricultural insurance



**Up to 15 000 GEL** Grant for  
introduction of International Standards

## Outlook – Message in a nutshell

- Use the economic Input-Output (IO) framework for a first overview of effects
- Framework maps direct effects and indirect effects
- Helps to identify vulnerable sectors
- Shows how recovery measures will support the economy and secure jobs
- Crucial to translate shocks and recovery measures into the IO framework
- Framework can be applied to other topics, such as effects of structural change, reduced/increased exports, green investment etc.

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# References

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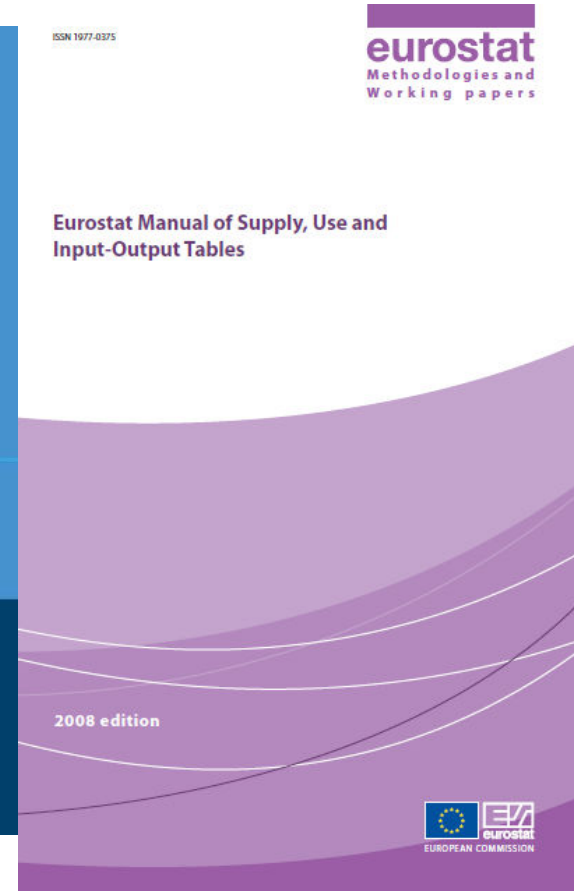
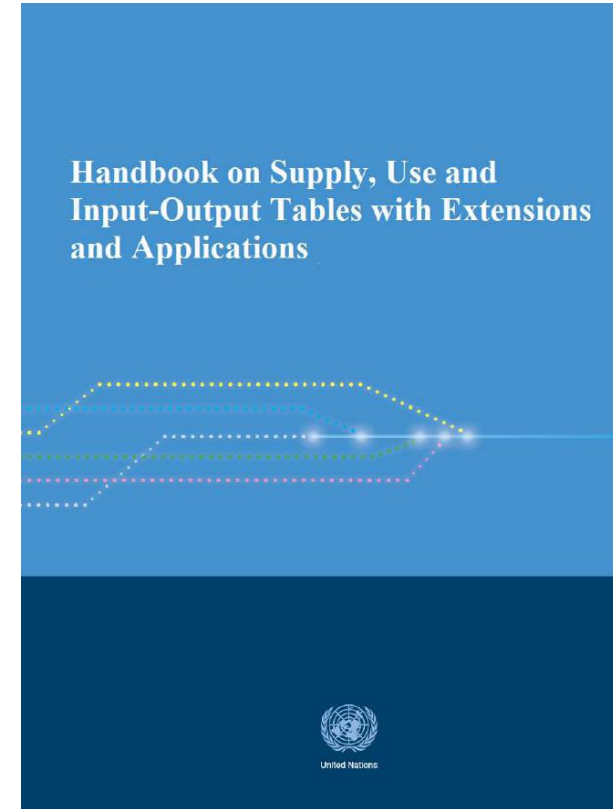


# The benefits of Input Output tables

Wassily Leontief (1905-1999) is often referred to as the pioneer of Input-Output based economics with the first of many key contributions when he published his article on 'Quantitative input and output relations in the economic system of the United States'. This article discussed the construction of an economic transactions table that Leontief based on the Tableau Economique, proposed by François Quesnay in 1758.

The framework was developed and applied as an economic tool with the construction of the first IOTs for the USA covering the years 1919 and 1929 published in 1936. Later, Leontief developed the first I-O based model, which was based on theories developed by Leon Walras published in 1874 and 1877. Leontief was recognized for his pioneering work receiving the Nobel Prize in 1973. As a result, I-O analysis has become a major tool in developing quantitative economics as a science.

(UN Handbook 2018;  
[https://unstats.un.org/unsd/nationalaccount/docs/SUT\\_IOT\\_HB\\_wc.pdf](https://unstats.un.org/unsd/nationalaccount/docs/SUT_IOT_HB_wc.pdf) )



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# Questions and Answers

Please type your questions or points for discussion into the chat window.

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# Information on 1-on-1 Clinics

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# ICR Facility 1-on-1 Clinics

Targeted support virtual, individual support sessions around 1-2 hours



- **Eligibility:** public or private organization based in ACP country
- Slots will be granted based on availability.
- Support will respect a regional balance across the ACP.

Exchange directly  
with us and get  
support for your  
organisation

- Register your interest until 23 July 2020 via [icrfacility@giz.de](mailto:icrfacility@giz.de)
- Indicate your organisation and the questions you want to pose



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