

**EV20001 - ENVIRONMENTAL SCIENCE**



**Lecture #2**

# **Introduction to Sustainable Development**

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# Sustainable Development

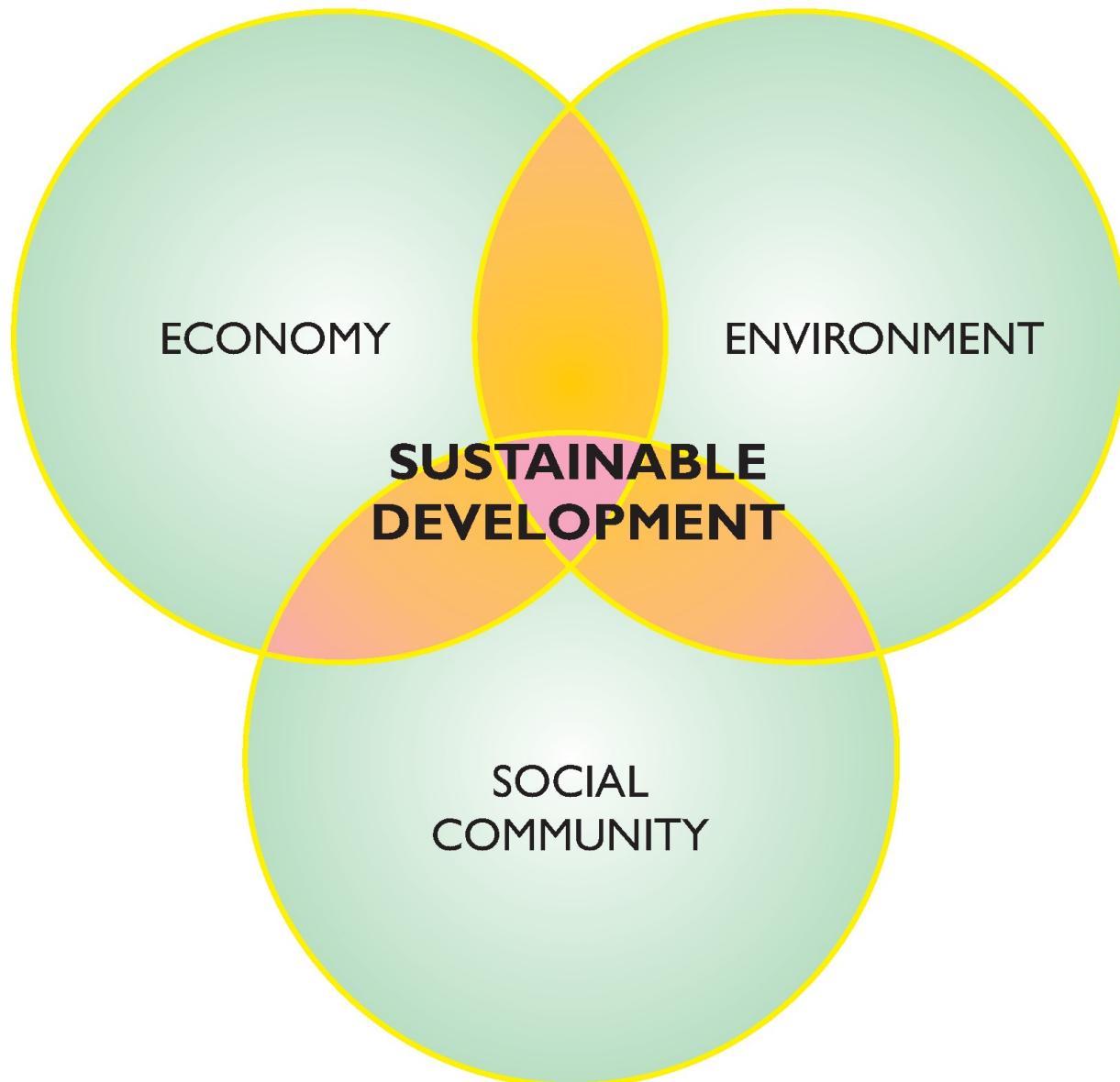


“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”

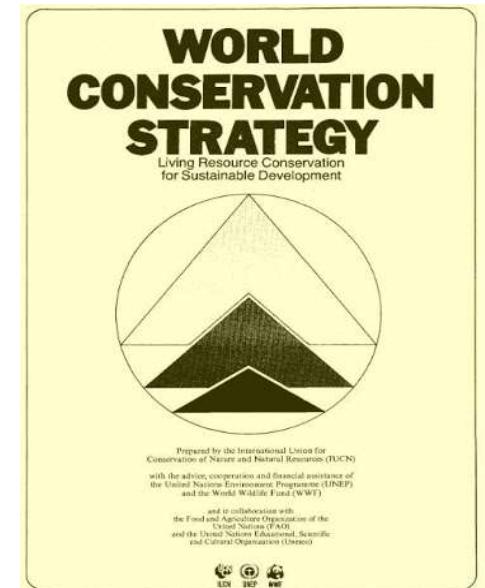
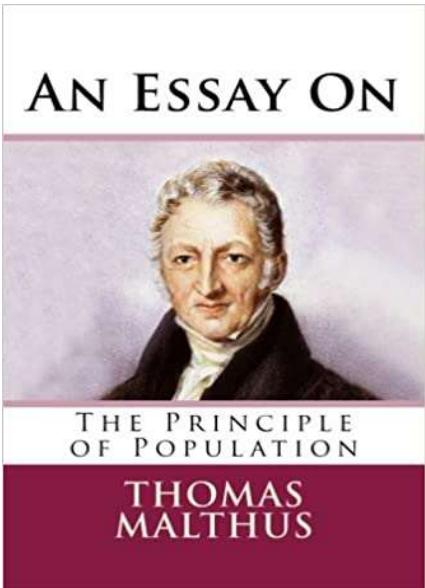
definition by the Brundtland Commission  
of the overall goal of sustainable development

1987

# 3 Pillars of Sustainability



# Historical Roots of the Concept



THE WORLD COMMISSION  
ON ENVIRONMENT  
AND DEVELOPMENT



# Historical Roots of the Concept



AN ESSAY ON

WORLD CONSERVATION DAY

1 ERADICATE EXTREME POVERTY AND HUNGER

2 ACHIEVE UNIVERSAL PRIMARY EDUCATION

3 PROMOTE GENDER EQUALITY AND EMPOWER WOMEN

4 REDUCE CHILD MORTALITY

5 IMPROVE MATERNAL HEALTH

6 COMBAT HIV/AIDS, MALARIA AND OTHER DISEASES

7 ENSURE ENVIRONMENTAL SUSTAINABILITY

8 A GLOBAL PARTNERSHIP FOR DEVELOPMENT

ON ENVIRONMENT AND DEVELOPMENT

PROGRESS

THOSE CONSIDERED EXTREMELY POOR ACCOUNTED FOR ALMOST HALF OF THE DEVELOPING WORLD'S POPULATION IN 1990. TEN YEARS BEFORE THE MDGs WERE ESTABLISHED, IN 1990, 5 YEARS INTO THE MDGs, THEY ACCOUNTED FOR JUST OVER A QUARTER.

# 2030 Agenda for Sustainable Development



- The Sustainable Development Goals (SDGs) are a set of 17 objectives set forth by the United Nations in 2015 to define the global development agenda for the next 15 years until 2030.



# Goal #1: No Poverty



**1** NO  
POVERTY



## End poverty in all its forms everywhere

See the globally adopted targets for this goal on the UN website:  
<https://sustainabledevelopment.un.org/topics>

### Edmonton, Canada

#### The role of cities in ending poverty

More than 100,000 Edmontonians live in poverty, which costs Edmonton up to \$7.1 billion each year in healthcare and social services. The EndPovertyEdmonton initiative seeks to eliminate poverty in Edmonton within a generation, based on economic arguments, the human rights case and a public opinion approach. Through strong public participation, multiple stakeholders are engaged in development of a long-term plan against poverty.

### Tshwane, South Africa

#### Poverty reduction and community development conference, Tshwane Vision 2055 'Remaking South Africa's Capital City'

In Tshwane, approximately 27.9 percent of the population live in poverty. Since 2008, the local government has been developing an integrated poverty reduction and community development strategy. Based on community-driven approaches, over ten poverty alleviation programs are being delivered in the city, targeting housing facilities, grants-in-aid and support for the orphans.

# Goal #2: Zero Hunger



**2** ZERO  
HUNGER



## End hunger, achieve food security and improved nutrition

See the globally adopted targets for this goal on the UN website:  
<https://sustainabledevelopment.un.org/topics>

### Almada, Portugal

#### Promoting local food production

Agriculture in Almada has strong cultural traditions, as about 23% of land is used agriculturally. With the goal to become self-sufficient in its horticulture needs, the City of Almada promotes agriculture activity in local urban and peri-urban areas. The initiative enhances green infrastructure and the agricultural parks network, wastewater recycling for horticulture, are targets, master plans and information activities.

### Dar es Salaam, Tanzania

#### Demonstrating the Urban NEXUS approach to link water, energy and food resources in schools

Through cross-institutional collaboration, two schools in Dar es Salaam operationalized the Urban NEXUS approach as a new design process towards resource-efficient and productive service delivery. The project serves as an example of integrated solutions for optimizing energy, water and food to be scaled up throughout the metropolitan region.

# Goal #3: Good Health & Well Being



**3** GOOD HEALTH  
AND WELL-BEING



## Ensure healthy lives and promote well-being for all at all ages

See the globally adopted targets for this goal on the UN website:

<https://sustainabledevelopment.un.org/topics>

### Santa Monica, USA

Define, measure and actively improve wellbeing

Santa Monica's Wellbeing Project followed the city's 2013 success in the Bloomberg Philanthropies' inaugural Mayors Challenge, which encouraged the city to develop a local measure of well-being. A new wellbeing index brought together a global consortium of experts to develop a framework, which can be practically applied for local policy-making based on developmental progress beyond GDP measures.

### Thimpu, Bhutan

Toward a new development paradigm

In March 2014, the city of Thimphu hosted local forums on the concept of a New Development Paradigm (NDP), a holistic and sustainable approach to development which prioritizes the happiness and well-being of humans and all life. The NDP draws on the Gross National Happiness Index and guides institutions to create policies that can deliver the conditions for sustainability and dynamic contributions to people's health and happiness.

# Goal #4: Quality Education



**4** QUALITY EDUCATION



**Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all**

See the globally adopted targets for this goal on the UN website:

<https://sustainabledevelopment.un.org/topics>

## Helsingborg, Sweden:

[Environmental education and participation for local sustainable development](#)

The city of Helsingborg established the Environment Workshop and Sustainable School Campus as long-term educational projects in a collaboration between the municipal departments for School and Youth Services, and City Planning and Technical Services. By engaging young students, the city is promoting quality education and a long-term behavioral change towards sustainability.

## Beijing, China

[An experienced learning city in a new phase of development](#)

Beijing officially launched its “learning city” agenda in 1999 in order to promote innovation, sustainability and inclusiveness in preparation for the 2008 Olympic Games. The strong leadership of the Beijing Municipal Government has led to strengthened community education and the creation of websites that serve as lifelong learning platforms for citizens. The Learning Beijing initiative has grown rapidly over the last fifteen years.

# Goal #5: Gender Equality



**5** GENDER EQUALITY



## Achieve gender equality and empower all women and girls

See the globally adopted targets for this goal on the UN website:  
[https://sustainabledevelopment.un.org/topics/gender\\_equality](https://sustainabledevelopment.un.org/topics/gender_equality)

### Växjö, Sweden

#### Women leaders transforming cities

Under the lead of the Mayor of Växjö, a discussion on how local governments can foster women's leadership and participation at all levels - from the citizen on the street to the mayor's office is underway. The example of Sweden helps to explore the opportunities for the entire political engagement process, which is necessary if governments are to better foster effective women leaders for climate and sustainability.

### Rosario, Argentina

#### Gender inclusive cities program

The Equal Opportunities Plan is the most important policy developed by the municipality of Rosario to achieve gender equity. Its formulation and implementation, including gender mainstreaming, interventions directed at women's strategic interests, not only their basic needs and transformative gender policies. It intends to act upon the causes that create inequalities between men and women.

# Goal #6: Clean Water & Sanitization



## 6 CLEAN WATER AND SANITATION



# Ensure availability and sustainable management of water and sanitation for all

See the globally adopted targets for this goal on the UN website:  
<https://sustainabledevelopment.un.org/topics>

## Melbourne, Australia

### Total watermark program invests in stormwater harvesting

In the decade known as the Millennium Drought, the State of Victoria experienced rainfall 14 per cent below average. This drought, combined with severe water restrictions affected the health of Melbourne's urban forest sending many trees into decline. The City implemented several large stormwater harvesting schemes across the city, invested \$20 million in their stormwater harvesting network, which is now delivering 25% of the city's annual landscape water requirements and is reducing the reliance on potable water.

## Nashik, India

### An Urban NEXUS approach to optimize water, energy and land resources in peri-urban agriculture

The Nashik Municipal Corporation adopted an Urban NEXUS approach to improve resource productivity at the local and regional level in India, and to avoid consequences of narrow sectoral approaches causing unsustainable water management. The Urban NEXUS pilot project introduced a collaborative design and implementation of innovative solutions and programs for optimizing water, energy and land resources in peri-urban agricultural practices in Nashik.

# Goal #7: Affordable & Clean Energy



7 AFFORDABLE AND CLEAN ENERGY



## Ensure access to affordable, reliable, sustainable and modern energy for all

See the globally adopted targets for this goal on the UN website:

<https://sustainabledevelopment.un.org/topics>

### Vancouver, Canada

#### 100% Renewable Energy Target

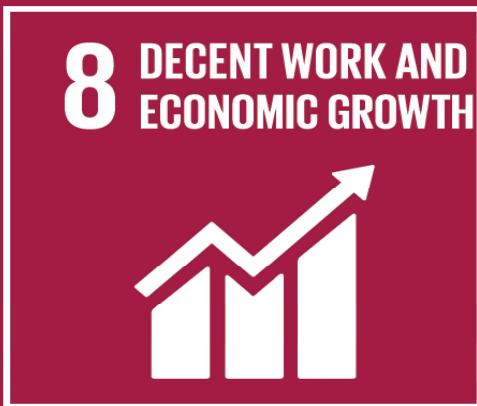
ICLEI Member Vancouver recently took a huge step towards becoming a fully sustainable city, with its City Council voting for the long-term goal of deriving 100 percent of the city's energy from renewable sources. Vancouver joins a number of other cities, including San Francisco, Copenhagen and Sydney, in making this ambitious target a part of its urban planning.

### Balikpapan, Indonesia

#### Multi-faceted stakeholder approaches for a low-carbon city

Urban-LEDS Model City Balikpapan used its first GHG inventory, to define emission reduction targets for the community by 2020 with 15.6% based on 2010 levels. Among other areas, the city works on protection and expansion of a protected city forest area, energy-efficient lighting, a waste-to-energy landfill methane capture facility, and is involved in the Corporate Social Responsibility forum working with businesses.

# Goal #8: Decent Work & Economic Development



**Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all**

See the globally adopted targets for this goal on the UN website:  
<https://sustainabledevelopment.un.org/topics>

## Bristol, United Kingdom

### UK's first city-wide local currency

The Bristol Pound is a form of community currency with a goal to support local businesses and employment in Bristol. It emerged as a not-for-profit partnership between Bristol Pound Community Interest Company (CIC) and Bristol Credit Union and is governed in line with the model of a stakeholder cooperative, thereby giving Bristol Pound account holders a say in the development of the company and representation on the board.

## Ehlanzeni, South Africa

### The Integrated Water Harvesting Project for food security and income generation

Ehlanzeni district has a high unemployment rate of 76%, with four out of five people living below the government's official poverty line on less than \$US 60 cents per day. The Ehlanzeni district Integrated Water Harvesting Project targets four of the poorest communities in Mpumalanga Province, sustainably improving local livelihoods through a water-food-health NEXUS that aims to boost agricultural production and community income.

# Goal #9: Infrastructure, Industry & Innovation



## 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



**Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation**

See the globally adopted targets for this goal on the UN website:  
<https://sustainabledevelopment.un.org/topics>

## Tokyo, Japan

### Urban Cap-and-Trade Programme and Reducing emissions through green building

The Tokyo Metropolitan Government (TMG) launched the Cap and Trade Program in 2000 to establish total emission reduction obligations for existing commercial buildings (those that use over 1,500 kiloliters of crude oil annually). Together with the Green Building Programs, the Cap and Trade concept contributes to TMG's policy goal to reduce CO<sub>2</sub> emissions by 25 percent below 2000 levels by 2020.

## Dezhou, China

### Green economic development with renewable energy industries

In 1997, the municipality and local government of Dezhou elaborated a Development Plan for the Dezhou Economic Development Zone to bring together solar technology research, manufacturing, education and capacity building. Dezhou now hosts over 120 solar energy businesses generating an annual turnover of USD 3.46 billion. The plan showed how local governments are essential to stimulate renewable energy industry and can catalyze economic development in the region.

# Goal #10: Reduced Inequalities



**10 REDUCED INEQUALITIES**



## Reduce inequality within and among countries

See the globally adopted targets for this goal on the UN website:  
<https://sustainabledevelopment.un.org/topics>

### Paris, France

#### A plan to stop housing displacement

In December 2014, the city of Paris announced a housing plan to stop displacement in central, predominantly gentrified, neighborhoods. With its plan to support rental options to lower- and middle-income residents, the city published a list of over 200 addresses with over 8,000 apartments that the city would have a 'right of first-refusal' to buy as subsidized housing for poor and marginalized dwellers.

### Bogotá, Colombia

#### Bogotá Humana

In June 12, 2012, the city of Bogota officially introduced the Human Development Plan Bogota, a city project that is the roadmap for the four year administration period. The core idea of the plan is to combat social segregation and build an inclusive, dignified and equitable city, while tackling corruption and insecurity. One of the actions is the creation of an environmental district (57 km) around the rivers Fucha, Salitre, Tunjuelo, and Torca with a strong community involvement.



**Environmental space** is the total amount of non-renewable resources, agricultural land, water resources, and forest resources that can be used globally without impinging on access by future generations to the same resources. Should every person in the world have the same share of environmental space?

# Goal #11: Sustainable Cities & Communities



**11 SUSTAINABLE CITIES  
AND COMMUNITIES**



## Make cities and human settlements inclusive, safe, resilient and sustainable

See the globally adopted targets for this goal on the UN website:  
<https://sustainabledevelopment.un.org/topics>

### New York City, USA

#### #OneNYC for a strong and just city

In 2007, the city of New York introduced The Plan for a Strong and Just City "#OneNYC" (originally called 'PlaNYC') as a groundbreaking concept to address the city's long-term challenges: 9 million citizens by 2040, changing climate and economy, and aging infrastructure. The #OneNYC plan sets a number of goals and targets, including elevating 800,000 people out of poverty by 2025, and introducing a zero-waste concept.

### Mexico City, Mexico

#### Plan Verde

Also in 2007, the Mexico City embarked on a 15-year Green Plan (Plan Verde). The plan, which is supported by the United Nations and the World Bank aims to invest approximately 8% of the city's annual budget into a wide range of sustainability initiatives, with particular emphasis on reducing traffic and improving air quality.

# Goal #12: Sustainable Consumption & Production



## Ensure sustainable consumption and production patterns

See the globally adopted targets for this goal on the UN website:  
<https://sustainabledevelopment.un.org/topics>

### Helsinki, Finland

#### The Global Lead Cities Network

In 2015, the City of Helsinki set a goal to achieve 100 percent sustainable public procurement by 2020. To attain this goal, Helsinki implements policies to support the transition to sustainable procurement, including medium-term and long-term environment policies. Currently, the city aims at reducing the volume of communal waste by 10% compared to 2013 levels, and increasing the amount of materials reused from communal waste by 10%.

### Cape Town, South Africa

#### The Global Lead Cities Network

The City of Cape Town will be undertaking a review of its spending to assess where the greatest environmental impact can be achieved, including the role that sustainable public procurement (SPP) can play. With changes in procurement, the city's green procurement efforts can contribute to a total saving of approximately R120 million is expected by 2018.

# Goal #13: Climate Action



**13 CLIMATE ACTION**



## Take urgent action to combat climate change and its impacts

See the globally adopted targets for this goal on the UN website:

<https://sustainabledevelopment.un.org/topics>

### Seoul, Republic of Korea

#### The Promise of Seoul - Taking Actions against Climate Change

Recognizing the need to engage the public, Seoul Metropolitan Government decided to engage with its citizens to create an action plan to tackle climate change. This plan marks a promise from Seoul Metropolitan Government to change lifestyles of the 10 million Seoul citizens, while living up to and enhancing the city's reputation as environmental, cultural and global leader.

### Mexico

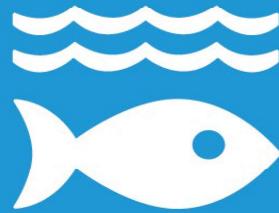
#### Municipal Climate Action Planning and Implementation for Mexican Cities

In Mexico, the Municipal Climate Action Plan (Plan de Acción Climática Municipal, short PACMUN) strengthens local capacity by training local government officials to develop and implement municipal climate change policies and development plans. To increase multi-level government action, the PACMUN program supports with GHG emissions inventories, mitigation and adaptation guidance, and raising climate change vulnerability awareness.

# Goal #14: Life Below Water



**14** LIFE  
BELOW WATER



**Conserve and sustainably use the oceans, seas and marine resources for sustainable development**

See the globally adopted targets for this goal on the UN website:

<https://sustainabledevelopment.un.org/topics>

## Rotterdam, Netherlands

### The Delta Cities network

City of Rotterdam is an active member of the Connecting Delta Cities (CDC) network. Within this network, Rotterdam implements a number of sustainability projects on water quality and recreation. One of such projects includes the introduction of lush greenery and a healthy cover of riparian vegetation to the river banks and the tide-influenced estuary. Work is currently underway at the Nieuwe Waterweg and the Nieuwe Maas.

## Sriracha, Thailand

### Balancing development and conservation with integrated coastal management

Since 1999, Sriracha Municipality, together with other local governments of Chonburi province, has developed an Integrated Coastal Management (ICM) project. By late 2008, 26 local government units were part of the Chonburi ICM network, which covers the entire 157 km coastline of Chonburi province. One of the focus areas of the project, the Blue Swimming Crab conservation activities, has resulted in increasing crab related eco-tourism.

# Goal #15: Life on Land



**15** LIFE  
ON LAND



**Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss**

See the globally adopted targets for this goal on the UN website:

<https://sustainabledevelopment.un.org/topics>

## Winnipeg, Canada

### An Urban Forest: Valuable to Both Ecosystem and the Community

The Bois-des-esprits (or Spirit Forest) is an urban forest on the Seine River and is the largest remaining riverbank forest in Winnipeg. Rapid urban sprawl has threatened the forest. The City has established a Forest Management Planning Process to protect the entire forest from harmful urban development in a partnership between various municipal departments, community development groups and the Province of Manitoba.

## Walvis Bay, Namibia

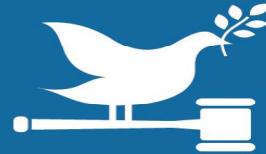
### Pioneer in Local Action for Biodiversity Programme and URBIS

The Walvis Bay Lagoon is considered one of the richest and most important wetlands in southern Africa, with approx. 20 bird species regularly occurring in numbers greater than 1% of their world population. Walvis Bay established the Walvis Dune Belt Management Plan to protect the dune ecosystems from disturbances from irresponsible recreational activities such as off-road driving. Zoning the area for specific uses is one of the key strategies employed by the plan.

# Goal #16: Peace, Justice & Strong Institutions



**16** PEACE, JUSTICE  
AND STRONG  
INSTITUTIONS



**Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels**

See the globally adopted targets for this goal on the UN website:  
<https://sustainabledevelopment.un.org/topics>

## Paderborn, Germany

### New Neighbours (Neue Nachbarn) – Paderborner Help Refugees Initiative

In June, 2015, the City of Paderborn established a new initiative to strengthen the positive attitude of Paderborn towards its new citizens, and to support civic engagement for refugees. Its main goals are to strengthen the inclusiveness of the local society, encourage cross-cultural projects and avoid the formation of ghettos. The initiative is supported by a broad coalition which includes multiple religious institutions and social service organizations in Paderborn.

## São Paulo, Brazil

### Promoting Open Government action

The City of São Paulo introduced a municipal open government agenda. It is one of the first cities in the world to embrace issues of transparency, social participation, technological innovation and integrity in public policies. Open Government has become one of the priorities for this administration and the municipal initiative, entitled São Paulo Aberta, was established by Official Decree in January, 2014.

# Goal #17: Partnerships for Achieving the Goals



**17** PARTNERSHIPS  
FOR THE GOALS



**Strengthen the means of implementation and revitalize the global partnership for sustainable development**

See the globally adopted targets for this goal on the UN website:

<https://sustainabledevelopment.un.org/topics>

## Bonn, Germany

### Decentralized cooperation for Renaturalization of Fosu Lagoon, Cape Coast, Ghana

Since 2012, Cape Coast and the City of Bonn have been partners in a project to restore the Fosu Lagoon, funded by the German Ministry for Economic Cooperation and Development as one of the “50 Municipal Climate Partnerships until 2015”. The four year project has increased knowledge of the sensitive ecosystem and contributed to the protection of this natural resource.

## Shimla, India

### Addressing future climate change by building institutional capacity

Shimla Municipal Corporation seized the opportunity to pilot the ICLEI-ACCRN Process (IAP) of climate resilience planning during 2012. The IAP pilot was an innovative approach to climate resilience planning that draws on the ACCRN experiences of the previous years. As a result, Shimla now has a better understanding of the future climate scenario the city may face.

# Dimensions of the Agenda

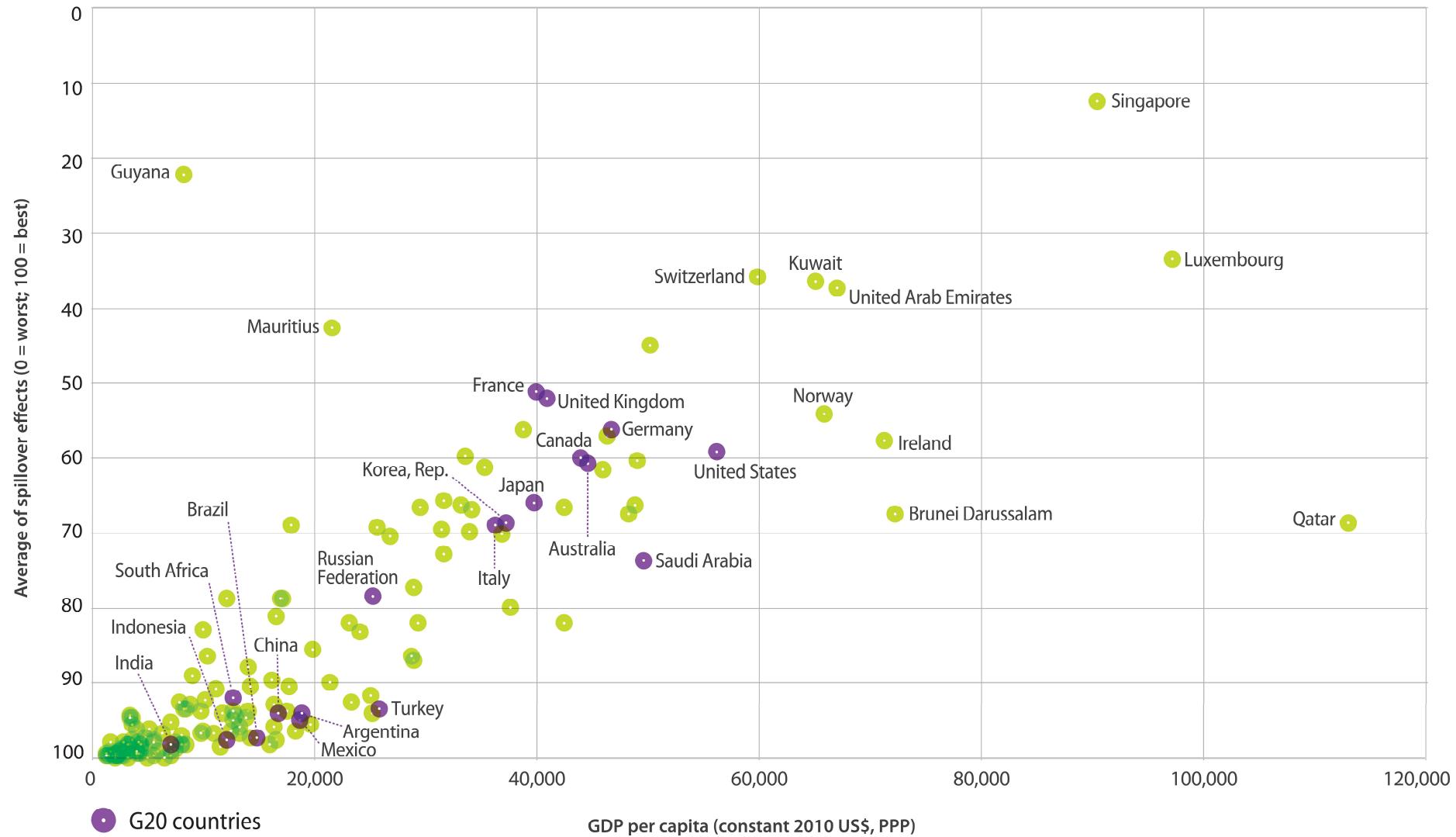


# International Spillovers



- Strategies to achieve the SDGs need to be implemented domestically without generating negative impacts on other countries (“spillovers”).
- The **Spillover Score** measures transboundary impacts generated by one country on others, which undermine their ability to achieve the SDGs. It covers financial spillovers, environmental and social impacts embodied into trade and consumption, and security/development cooperation.
- **Environmental spillovers** cover international spillovers related to the use of natural resources and pollution: (i) transboundary effects embodied in trade and (ii) direct cross-border flows in air and water.
- **Spillovers related to the economy, finance, and governance** cover international development finance, unfair tax competition, banking secrecy, and international labor standards.
- **Security spillovers** include negative externalities, such as the trade in arms and organized international crime, which can have a destabilizing impact on poor countries. Among the positive spillovers are investment in conflict-prevention and peacekeeping.

# Spillover Score



Average spillover score against gross domestic product per capita (GDP per capita, constant 2010 US\$, PPP)

# COVID-19 and the SDGs



- COVID-19 will have severe negative impacts on most SDGs.
- All countries need to strengthen the resilience of their health systems and prevention programs.
- The SDGs can inform the recovery from COVID-19.
- Asian countries have made the progress towards the SDGs since the adoption of the goals in 2015. Asian countries have also responded most effectively to the COVID-19 outbreak.
- Solidarity and partnerships are critical to address and prevent health, economic, and humanitarian crisis.
- Data gaps and time lags in official statistics require urgent investments in statistical capacity and increased coordination between governments and the private sector.

