BUILDING MATERIALS FOR SUSTAINABLE DEVELOPMENT

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BOOKS ARCADE

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Website: www.booksarcade.co.in

Year of Publication 2023

International Standard Book Number-13: 978-81-19199-80-8

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CHAPTER 1

BUILDING MATERIALS

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Our cities are physically held together by the component concrete. This widespread grey material's significance to everyday urban life is apparent, being used everywhere from houses and housing complexes to bridges, viaducts, and sidewalks. You may have heard, nonetheless, that it also conceals a dark secret: the fabrication of commercial conventional concrete contributes to greenhouse gas emissions by releasing tons of carbon into the stratosphere each year. However, things really shouldn't have to be that way. Eleven environmentally-friendly building materials have been compiled as substitutes for concrete .

Straw Bales

Straw bale construction pays homage back to the days when buildings were constructed from spontaneous, locally-occurring materials rather than depending on new technological advancements. Instead of using concrete, wood, gypsum, plaster, fiberglass, or stone, straw bales are used to make the walls of a house within one frame. Straw bales naturally produce extremely high levels of soundproofing for hot or cold temperatures when correctly sealed, and they are neither only economical nor renewable since straw is a resource that is constantly renewed .

Grass Crete

As the name suggests, promoting nature is a procedure for installing concrete floors, footpaths, sidewalks, and roadways featuring open patterns that enable grass and perhaps other plants to grow. Overall concrete consumption is diminished as a result, but there is yet another significant benefit: enhanced storm water absorbent and evacuation.

Rammed Earth

What could be more biological than the ground underneath your feet? In reality, with nothing other than soil packed down firmly in wooden forms, walls with a roughness like concrete may be made. Human civilization has been using building material technology for several thousand years, and it is durable. Rebar or bamboo can be employed to make modern rammed earth constructions safer, and automated tampers can eliminate the effort required to create robust walls .

Hemp Crete

Hemp Crete is exactly what it appears like a substance made from the fibrous inner fibers of the hemp plant which resembles concrete. Lime is used to bind the hemp filaments, resulting in strong, structural components that resemble concrete. Hemp itself is a quickly-growing,

sustainable material, and hemp Crete blocks are already so light that the energy used to transport them may be substantially lowered.

Bamboo

Although bamboo may sound fashionable, it has been employed as a locally derived material for construction for thousands of years in various parts of the globe. The confluence of bamboo's tensile strength, lightweight, and quickly expanding regenerating nature makes it such a various construction material for contemporary architecture. Bamboo, which is used for framing buildings but rather shelters, can take the place of complicated and expensive and heavy goods imported and offer a construction alternative to concrete and rebar, especially in hard-to-reach areas, post-disaster rebuilding, and low-income places with direct connections to containing natural locally grown bamboo.

Recycled Plastic

Researchers are manufacturing concrete that comprises ground-up recycled plastics and garbage instead of excavating, extracting, and manufacturing new components. This decreases greenhouse gas emissions, saves weight, and gives heretofore landfill-clogging plastic in the ocean a meaningful direction.

Wood

Compared to more building and construction materials such as steel or steel, plain old wood maintains to have a plethora of advantages. In addition to absorbing CO2 as they grow, trees could also be processed into building materials needing substantially less energy. In addition to being renewable, the well-maintained forest may guarantee a bio-diverse environment.

Mycelium

Mycelium, the selection of fungus and mushrooms, is a seemingly futuristic construction that is quite natural. To make lightweight and resistant bricks or other formations, mycelium may be stimulated to develop around a composite of certain other natural materials, also including ground-up straw, in molds or forms. These structures can then be air-dried.

Ferrock

To develop a construction material that resembled pavement but is even sturdier than concrete, the new composite frock employs recycled resources, including titanium dust from either the steel industry. Additionally, throughout the cooling and hardening processes, this special component stores and collects carbon dioxide, making it in addition to being less carbon-intensive than ordinary concrete but also carbon neutral .

AshCrete

Fly ash is used in AshCrete, a concrete equivalent, in place of conventional cement. 97 percent of the parts and components in concrete may be replaced with reclaimed wood by employing fly ash, a by-product of generating electricity.

Timbercrete

Sawdust and concrete are mixed to produce the remarkable materials for construction known as timber create because sawdust is lighter than concrete, it minimizes transportation emissions

while also repurposing waste materials and eliminating some of the more energy-intensive elements of conventional concrete. Blocks, bricks, and pavers are illustrations of standard types that may be created with timber crates .

Dry Mortar in Construction

The raw material, the basic construction component, is most significant in any construction since it holds the whole superstructure together. One such raw material utilized on construction sites is the dry mortar. Because it features several benefits over standard on-site mortar mixing, frequently it is selected. Here's why several individuals like dry mortar. Sand and cement are two common blended basic ingredients that are applied to make dry mortar. Polymers and compounds may also be incorporated. Bricks are connected with dry mortar before building to build a strong wall. It is a well-balanced blend of materials including cement, sand, minerals, and beneficial additives .

In other words, the dry mortar is most often pre-mixed in a particular facility and then brought to that same building site in powder or granulated form. Dry mortar is typically made of four parts sand to one part cement. Depending on whether the mortar is meant for concrete bricks, internal brick walls, or structural brickwork, the ratio increases. Touching on its use, dry mortar is indeed utilized to fill up the large gaps in concrete blocks. The dry mortar should be poured down in layers of 10 mm and then squeezed with a hammer, stick, or timber rod once the components have been adequately mixed .

Typically it is used for:

1. Repair small areas that are deeper than they are wide
2. Filling holes, for cone bolts, core holes, and grout-insert holes for holes left by the removal of form ties and
3. For narrow slots cut for repair cracks.
4. Various Advantages of Dry Mortar in Construction

Consistency

Consistency in putting in more effort is one of the dry mortar's main advantages. Speaking of the same, "The major benefit of dry mortar is that it comes already prepared using such a predetermined recipe and stocked with the required gathering of raw ingredients.

The substance becomes ready for use after you've incorporated the necessary quantities of water. Unlike on-site mixing of mortar, it is a homogenized mortar, thus the product's consistency is constant continuously. Because mixing mortar demands highly trained labor, which is challenging to buy, there is a lack of mortar of a consistently high standard .

Time Saving and Its Availability

The use of dry mortar promises significant reductions in time for the project's completion and concrete plaster work. It is not required to combine separate components, such as cement and sand.

The mixture is made in such a manner that it may be effortlessly applied and tamped, compressed, and slanted. Premix bags are also widely available throughout the year, however unlike erratic raw materials supply like sand, mortar, etc.

Superior Quality and Good Finish

Also because the material is consistent, the quality is stronger and the finish is better. Equally leveled brick and ceiling installations provide simple consistency and higher finishing. Due to the best particle shape grading, the surface finish after the distribution is also excellent and precisely layered, therefore improving the performance of wall plaster. It comes with a thickness of 10-12 mm and covers 15-20 square feet for each bag of 40 kg because of its moderate density and high volume. With its strong compressive and elastic strengths, dry mortar aids in the strengthening of infrastructure by boosting masonry stiffness and load-bearing capacity. It is effective at reducing cracks, which improves durability and increases workability. Other benefits of having dry mortar in a building include several more .

It may be squeezed and applied by a machine, electronically mixed, and carried in a compact container, all of which improve work quality. Dry mortar lowers project costs, reimagines the building sector, and helps with the creation of industrial structures. Dry mortar implies that maintaining the mortar ratio is a hassle-free operation, as opposed to the traditional approach, which calls for manpower and monitoring to produce the mix. Another benefit is that the normal site mix procedure, consisting involves a sand sieve and substance mixing, produces the least amounts of waste possible. When compared with standard mortar, dry mortar necessitates a great deal less storage. Because there is a choice of equal-size packaging in bag form, stock administration seems to be quite simple.

Other Benefits

1. Sand and cement mixing upon that job site is no longer necessary.
2. Increased effectiveness and durability.
3. Increased Organizational potency.
4. It is readily compacted, pitched, and tamped.
5. Bathroom walls and virtualization software.
6. A more consistent and superior finish.
7. Time and money-saving.
8. Bricklaying and ceiling placement.
9. Application, respectively internal and external.
10. A decrease in cracks.
11. Simple application
12. Information on the Intended Use of the Construction Product
13. Intended Uses

The lightweight panel is designed to be employed as a load-bearing or non-load-bearing element for straightening steel-framed exterior and interior walls of buildings, particularly single- or medium-rise apartment structures, especially those that contain light steel framing technology. The thin panel may also be utilized in composite flooring that is mounted to steel beams with thin walls some of which are spaced no more than 600 mm apart. For a simulation environment.

To adhere to the safety and serviceability demands, the use of the lightweight panel in combination with flooring, where applicable, call for the use of an extra layer of a competent reinforcement component .

The lightweight panels may be mounted to floors and walls with joints running along the length and width of the panels. Within two adjacent panels, the joints throughout the width of the panels must be made discontinuous, and they ought to not appear in the space between two supports. The thin sheets must withstand all applied loads. Each panel in a floor must withstand simultaneously its weight and any applicable variable loads that are applied ordinarily to its surface. Each panel in a wall must be capable of handling the weight of that panel alone, wind loads, and any other relevant changing loads applied normally to its surface. The lightest panels are simply intended to improve the building's racking resistance. The procedures for analyzing the lightweight panel subjected to earthquake activities are not described in the current documentation .

Working Durability

The manufacturer suggested that the evaluation methodology used or referenced in this EAD should take into account the lightweight panel's projected 50-year life of the equipment when it is placed in the structure. These rules are based mostly on the state of the art at the time, and on the experience and expertise that is now accessible. The manufacturer's intended application for the products must be considered while examining it. Real working life might be much extended under regular usage circumstances without necessarily reducing the essential elements of work. The information provided regarding the expected professional years of the construction product is only designed to convey the expected, economical and practical working life of the product and is not destined to be interpreted as a guarantee by the supplier or manufacturer or his representative, EOTA when drafting this EAD, or the Technical Appraisal Body when authorizing an ETA based on this EAD .

The complexity of Dry Mortar

Bricks are connected while constructing a structure using mortar. The components needed to create a substance that may be utilized to construct a sturdy brick wall are put together to produce dry mortar. Because tradesmen are no longer held fully accountable for the mortar's quality, this product has become increasingly popular in recent years. The person who endures it is the product's maker.

Dry mortar is made from the following raw materials:

1. Sand
2. Limestone Powder
3. Pement
4. Hydrated Lime

Depending on the dry mortar's proposed use, additional substances may be added. For a variety of structures, including those that substituted concrete blocks for bricks, dry masonry may be employed. The accompanying uses for this product are therefore possible:

1. Interior and Exterior Stucco
2. Filler

3. Adhesive for Tiles
4. Repairing Plaster
5. Stucco Repair

The dry mortar mixture is blended with water just before being used when using bricks on a building site. The dry mortar mix might well be manually or continuously added to the water once it has been distributed in a bag. The mix only lasts for a limited amount of time after it has been wet. Only the quantity that perhaps the bricklayer will be able to incorporate in the next several hours should be mixed. Another batch may be generated when the mortar is empty. Either a piece of machinery or a person may apply the mortar composition.

Due to the shorter setting process for the concrete, the technique is quicker and more cost-effective for manufacturers.

Before beginning work, the bricklayer used to be in command of mixing the mortar mostly on the job site. Given that it was contingent on the individual cooking it every other time, the quality of the result through this approach was unlikely to be constant. On request, certain manufacturers provide their clients with customized mortar products. This implies that the consumer may get the mixture of materials that will be most effective for both the project that they are working on. This will be accomplished by employing local resources .

One may purchase dry mortar once at a construction supply shop. When repairing old mortar, protective clothing should be used to minimize injury from mortar exploding into the bricklayer's face while any loose portions are being removed. The mortar is replaced and uses a pointed trowel, and the seam is therefore sealed with an "S" jointer.

Corrosion Inhibitors and Corrosion Control Design

Corrosion, which is the degradation of a component brought on by its contact with its surrounding, may happen at any stage or time throughout the production of petroleum and natural gas. Although this term is accessible to all different kinds of materials, metallic alloys are generally the only ones that get to use it .

Forms of Corrosion

There are several categories of corrosion, and each one may be characterized by the circumstances that led to the metal's chemical breakdown. Galvanic corrosion and flow-assisted corrosion are two of the ten primary forms of corrosion that are mentioned in this topic.

Uniform Corrosion

A sort of corrosion attack that is substantially dispersed across the whole exposed surface of a metal is considered to as uniform or general corrosion. In ferrous elements and alloys that are not protected by corrosion inhibitors and/or cathodic protection, ubiquitous corrosion is a characteristic kind.

Galvanic Corrosion

Galvanic corrosion is the rapid degradation of a metal brought on by contact with a more noble metal in an electrolyte. This sort of degradation is predicted using the galvanic series of metallic materials and alloys.

Concentration Cells

Galvanic corrosion takes the form of concentration cells. Corrosion occurs from varying environments inside the electrolyte, much as it does where two dissimilar metals are together. When two or more sections of the same metal surface come into contact with polymer electrolytes that have varying concentrations, corrosion takes place. In the presence of distinct electrolyte concentrations, the same metal demonstrates various electrical characteristics. Dissimilar polarities are produced by variable aeration and ion concentration. Differential dissolved oxygen concentrations cause the metal to corrode locally in hiding spaces such as underneath deposits or cracks.

Crevice Corrosion

A limited assault on metal at a crack between two interacting surfaces is known as a corrosion product. Avoiding forms and joints that create cracks where oxygen cannot easily enter is seen as innovative design practices . Crevice corrosion is influenced by several processes, including:

The composition and metallographic composition of metal alloys.

Environmental variables include temperature, pH, oxygen saturation, and chloride concentration.

Surface roughness and defect geometrical parameters.

Pitting Corrosion

Pitting corrosion is a regional characteristic limited to smaller regions. Pitting corrosion often occurs when oxide coating is mechanically or chemically degraded and does not re-passivate on passive metals and alloys such as aluminum alloys, stainless steel, and alloys. The resultant pits, which might be deep as well as tiny, can quickly through such a metal's wall thickness. Pitting consequences of variation may be used to determine the likelihood of pitting and to avoid it by choosing the appropriate materials, managing the proportion of chloride, and installing cathodic protection.

Selective Corrosion

Sometimes, a metal or alloy's interior practices adopted corrosion and cause selective corrosion attack. Dezincification, dehumidification, and crevice corrosion are a few examples. Intergranular corrosion describes selective attack at or close to crystalline structure in a metal or alloy.

Erosion Corrosion

Erosion The destruction of metals and alloys caused by the relative movement of metal surfaces and corrosive fluids are characterized as corrosion. Abrasion occurs according to the speed of this movement. Grooves and surface abnormalities are characteristics of just this form of corrosion. Choosing a more tough material and improving the design seem to be ways to reduce erosion-corrosion and abrasion-corrosion .

Cavitation Corrosion

Cavitation corrosion is a specialized kind of erosion that originates when gas bubbles "implode" on a metal surface, generating pits behind. It often occurs in conjunction with abrupt pressure changes linked to the water's hydrodynamic qualities. Despite being a relatively low-energy

event, the collapse of a tiny aperture may corrode metals over time. The pitting that results from the collapse of chambers causes significant wear on components and may decrease the lifespan of a turbine or pump. Although crevice corrosion marginally reduces cavitation, sustaining excellent surface conditions and appropriate water flow are the key techniques for preventing cavitation erosion.

Flow-assisted Corrosion

When a coating of protective oxide on a steel surface is broken down or washed out to sea by water or wind, the underlying material is left vulnerable to additional degeneration and corrosion, which is defined as flow-assisted weathering or flow-accelerated corrosion .

Stress Corrosion

Stress corrosion cracking is the acronym for failure whenever a corrosive media and tensile stress are both present at the same moment.

Corrosion Control by Design

Corrosion prevention, according to an ancient phrase, must begin at the drawing board, during the planning phase. A good design is not any more expensive than a poor one. In truth, a poor design is constantly more costly than a good one .

Contacts with Metal

When two materials with opposite electrical reactions are joined together, significant bimetallic breakdown may result. If a galvanic cell emerges, corrosion of the couplings will take place; maintain in mind that corrosion stops if one of the components of a corrosion cell is removed. Avoid direct contact between the metals by insulating or protecting them with protective material to prevent deterioration. All joints should be engineered to be permanent and weatherproof as per acceptable design specifications.

Impurities and Deposit

Deposit and impurities must not be allowed because they can lead to differential aerobic treatment cells, which can adsorb moisture from the environment and cause corrosion. Such deposits can also destroy the passive surface of steel by turning the sites directly beneath them into the negative electrode, which can cause pitting. Consequently, a good design should prevent the buildup of contaminants on that surface.

Crevices

Any location where two metal coatings are separated by a small area is potentially a cell; moisture wants to enter the space frequently through capillary action; when the liquid comes into direct contact with air, oxygen is replenished; however, the center of the liquid droplet becomes oxygen-poor and corrosion starts to come to pass there. At bolted, riveted, polished, or overplayed plates, cracks occur behind spot-welded toppings or bolt joints under rims of steel plates that have been folded to produce a smooth outer edge and illustrates some characteristics of both excellent and terrible designs : Choose welded couplings over bolted or welded ones, Reduce metal-to-non-metal connections that might lead to unsightly crevices, Steer clear of sharp turns, edges, and fill up any gaps with fillers and mastics.

Inadequate Ventilation and Drainage

After the water has dissipated, rings of rust will be seen if a heavy downpour or spray falls on exposed steel. When ferrous ions from the anode and hydroxyl ions released on the cathode collide, rust rings form from each droplet, which serves as a differential-aeration cell. The corrosion consequences will be minimal if the material is free draining or if there is appropriate air to quickly dry the water droplets. If the raindrops remain for a long period, harm will even occur to paint surfaces. An increase in degradation is often seen on a structure's bottom surfaces, where the evacuation is probably less effective due to the area's prevailing air currents. All channels and container sections must have free-draining bottoms to alleviate standing water.

Contact with Wet Insulation Materials

As long as the cladding is dry, steel in contact with it will not wear away. Corrosion underneath insulation, however, can become serious if the insulation gets wet during space to store or use. Insulation components like glass wool, glass fiber, and polyurethane do not cause corrosion attacks in contact with them. The following are the causes of corrosion caused by insulation:

Moisture entering insulation enables soluble salts with a low pH to drain out.

Ions of chloride are released. The creation of pits and the chloride ion-induced destruction of passive steel, Weather patterns like wet-dry, hot-dry, and dump-warm cycles increase the rate of corrosion, Insufficient insulation spacing results in poor moisture barriers.

The following steps may stop insulation-related corrosion:

Removing horizontal flat surfaces. Water-retaining architectural features. Strict adherence to insulating thickness standards. Establishing a sufficient barrier and waterproofing. Inhibitor addition of sodium silicate.

Threading and Soldering

Soldering is preferred because threaded connections are so much more prone to the establishment of differential aeration cells. Soldering requires the use of a metallic with a higher noble perspective than the parent material. For reasons of manufacturing and dismantling, bolted linkages and threaded joints cannot always be avoided in temporary basis structures. They should be treated to prevent damage no matter how they are used. Figures illustrate the advantages of soldering over essential for effective and compare spot welding to rivets. They also highlight why welded joints are greater than recited joints.

Flowing Water System

The bulk of corrosion issues in installations with moving water is brought on by obstructions to unobstructed flow. Smooth flow conditions are negatively impacted by instability and impingement, which also triggers an erosion-corrosion assault. Inadequacies made during the manufacturing operation are one cause of failure . Below is a description of methods to reduce corrosion caused by flow:

Create replacement components for the system's most susceptible areas to corrosion. Choose materials that work well together and provide no threat of bimetallic corrosion. To minimize disruption to a smooth flow, all valves, flanges, and other fittings should be placed following design requirements on the pipe. Attacks take place in condenser tubes that handle seawater that

is moving rapidly and turbulently. By lowering the velocity and simplifying pipeline design, the issue may be solved. No abrupt changes in flow direction are permitted. Sacrificial baffle plates are useful for reducing corrosion. Another method for lowering velocity and decreasing corrosion in a water-flowing system is to increase pipe diameter. It is crucial to maintain and clean the pipe regularly since a buildup of pollutants may cause changes in the flow pattern. Avoid putting pipes in direct contact with sand, and utilize a supporting system to reduce vibrations.

CHAPTER 2

SACRIFICIAL ANODE CATHODIC PROTECTION

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In sacrificial anode cathodic protection, a less noble material that serves as a sacrificial anode is bonded to the structure that needs to be protected via metallic conductors. Zinc, aluminum, and magnesium are the components required for this. They both provide the structure energy to be safeguarded with and consumed. In situations when protective current needs and soil or water susceptibility are minimal, SACP is often deployed to guard well-coated regions. Likewise, it is used when a shielded material's surface area would be little .

Sacrificial Anodes: the basics

The fundamental concept underpinning employing sacrificial anodes is to make contact with a surface that has to be protected using only metal, such as zinc or aluminum. The easiest instance that comes to mind should be to mount a flat metal bar to the material that has to be protected. This approach is often deployed to safeguard and outside hull of ships. The geometry and characterization of anodes will be presented next:

The Geometry of an Anode

A simple anode will have two parts: the anode body and the anode insert. The anode body is the actual sacrificial material of the anode, while the insert is a generally flat bar or tubular, and made of steel. The insert is used to secure the anode to the surface to be protected using welding or bolting . The following Figure 2.1, illustrates the parts:

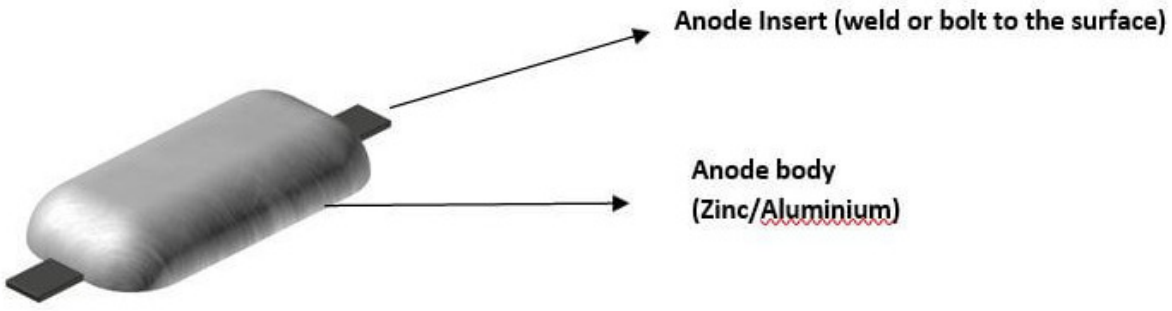

Figure 2.1: The Geometry of an Anode

Corrosion Explains Sacrificial Anode Cathodic Protection

High-activity metals called sacrificial anodes are exploited to stop the corrosion of high transmittance of less active materials. The SACP application makes advantage of the underlying

electrochemical opportunities of certain metals to provide encryption. As long as the anode seems to be more "active" than the structure, conventional current can flow from the anode to the structure, which is linked to an electrochemical dissolution . The anode, which "sacrifices" itself to protect from corrosive substances to the structure, experiences all corrosion as the electricity runs.

Features and benefits of SACP:

1. There is no need for a secondary electric power source.
2. Minimal impacts on neighboring buildings.
3. Additionally safeguarded are anode connections.
4. Making the right selection of material guarantees that there isn't any overprotection, therefore preventing coating degradation and metal galvanic corrosion.
5. There is no chance that inappropriate connections might destroy the plant.
6. Ease of installation, use, and support.

There are two types of cathodic protection based on supplying electrons to a structure:

1. Sacrificial anode cathodic protection : A less noble material acts as a sacrificial anode.
2. Impressed current cathodic protection : An external current source and rectifier is used.

The primary distinction between the two is that whereas SACP relies on the naturally existing electrochemical potential difference between various metallic materials to give protection, ICCP requires an external source of energy with inert anodes. The SACP and ICCP both offer unique benefits over one another.

The applicability, efficacy, organizational requirements, and cost analysis of a particular project all determine the approach that should be employed.

Understanding Sacrificial Anodes

One of the biggest threats to the ship and its components is corrosion. For the crew of the ship, he is also the most difficult foe to overcome. One material that is used frequently throughout the ship is iron. Iron is present in practically every equipment component utilized aboard, from the ship's primary structure to the tiniest piece portion of the project. When exposed to air and water, iron is just the substance that is most susceptible to corrosion. A ship is continuously in contact with water and breezes that are wet, which greatly raises the likelihood of corrosion. The ship's exterior, namely its hull, is in constant proximity to water, which makes it very sensitive to corrosion .

Sacrificial Anodes

For cathode protection, metal strips made of the top-order metals in the reactivity series are implanted and used as anodes. Sacrificial anodes are what they are characterized as. As an example, zinc can be used to act as a sacrifice anode for aluminum during the electrolysis process. Anode Insert and Anode Upper torso are the two parts that comprise the anode.

Out of these two, one is considered to be an anode body, which acts as an anode during the electrochemical reactions, and the other is referred to as an anode insert, which is utilized to properly attach the anode to that same parent surface using brackets, bolts, or welding.

The surface that has to be preserved against corrosion is known as the parent surface. In general, whatever portion of the ship that has to be protected against corroded is referred to as the parent ground or cathode, whilst the more aggressive material covering the portion of the ship that works as an anode is called a sacrificial anode .

Classification of Anodes

Anodes are categorized on a variety of parameters.As per the classification of anodes based on their shape, there are six types:

1. Flat or block-shaped
2. Tear-drop anodes
3. Cylindrical or semi-cylindrical
4. Disc-shaped
5. Bracelet anodes and Tubular anodes

According to the size of anodes, they can be of two types. The first one is small-sized anodes and the other is large-sized anodes .

Based on a material: anodes are Zinc anodes and aluminum, anodes are preferred in the marine industry. Based on the anode mounting method: there are flush-mounted anodes or slender anodes or sometimes just stand-off anodes. The differently shaped anodes apply to different situations.

The anode's form may be chosen based on several variables, including the shape of the machine or component that should be protected, the accessibility of various shapes under diverse circumstances, the availability of space, the accessibility of installation, etc. For instance, bell-shaped or cylindrical anodes are used to protect cylindrical pipelines.

Anode Securing

Three popular techniques, including bolts, welds, and the use of brackets or ties, may be used to fasten or fit the anode to the surface to be protected. The most effective approach among these three is welding because it can retain the most electrical continuity and keep the closest contact with the parent surface. In contrast, bolting and bracket connections are employed in areas that are inaccessible to welding. Another advantage of utilizing bolts and brackets for connections is that they may be replaced when they stop functioning correctly or for any other reason .

Working of Sacrificial Anodes

Sacrificial anodes operate on a similar theory to electrolysis, wherein, when an anode and a metallic strip are submerged in an electrolytic solution, anode electrons dissolve, deposit, and transform the metallic strip into a cathode in Figure 2.2.

Sea water serves as an electrolyte and carries the electrons from the anode to the steel plate in the situation of a ship by oxidizing it to generate a protective layer on top of the plate. If the metal is more reactive, it will deteriorate more quickly and serve as a cathode to safeguard the metallic complex. The anode, often known as a "sacrificial anode," will corrode first, giving itself up for the other component.

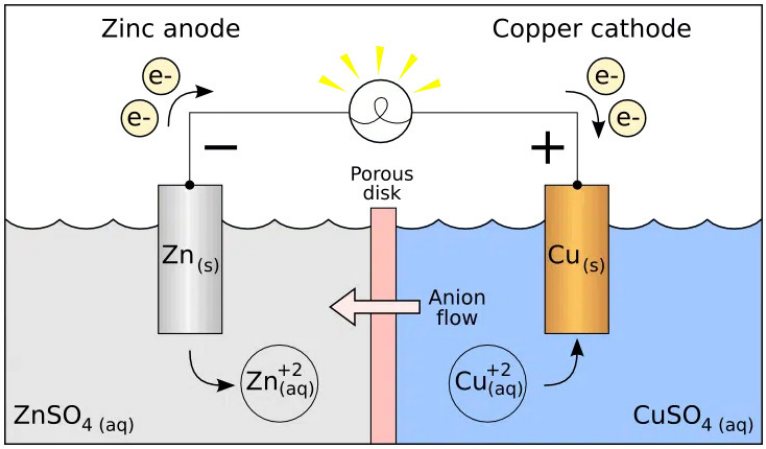

Figure 2.2: Represented the Working Process of Sacrificial Anodes.

Embodied Energy in Building Materials

Every human action influences the environment. Some have a considerably smaller consequence than others, whereas others have a huge impact. Up to 30% of all greenhouse gas emissions are ascribed to the building industry, as reported by the United Nations Environment Program.

Gases including CO_2, CH_4, N_2O, O_3, halocarbons, and water vapor are released as a consequence of commercial processes, transportation, processing, mining, and integrating chemical products. These substances warm our planet by capturing some of the sun's rays and redistributing them as radiation whenever they are emitted into the atmosphere.

This layer thickens because of the daily excessive gas emission, which allows solar radiation to reach the surface and remain there. Today, this "layer" has become sufficiently thick that civilization is starting to experience the effects, including desertification, glacier melting, water shortages, and storm, hurricane, and flood frequency increases, which have modified ecosystems and destroyed biodiversity .

The reduction of carbon emissions from either the buildings we design and create ought to be one of our highest issues as architects. It's an excellent place to start by becoming able to gauge, rank, and characterize this trait. The total effect of all greenhouse gas emissions ascribed to a material throughout its life cycle is referenced to as embodied energy or embodied carbon. This cycle includes excavation, production, building, upkeep, and disposal. Reinforced concrete, in contrast, has a very high embodied energy.

During the oxidation reaction, which turns limestone into calcium oxide, as well as during the fossil fuel combustion process in furnaces, significant volumes of CO_2 are emitted. We can comprehend the effects of each project choice on the environment if we add these concerns to the extraction of sand and stone, the usage of iron for reinforcing, and the transportation of the material to the building site. Since the minerals used in them must be collected and extracted using emission methods, other concrete structures like ceramic, brick, and plastic also need a substantial amount of energy to create in Figure 2.3.

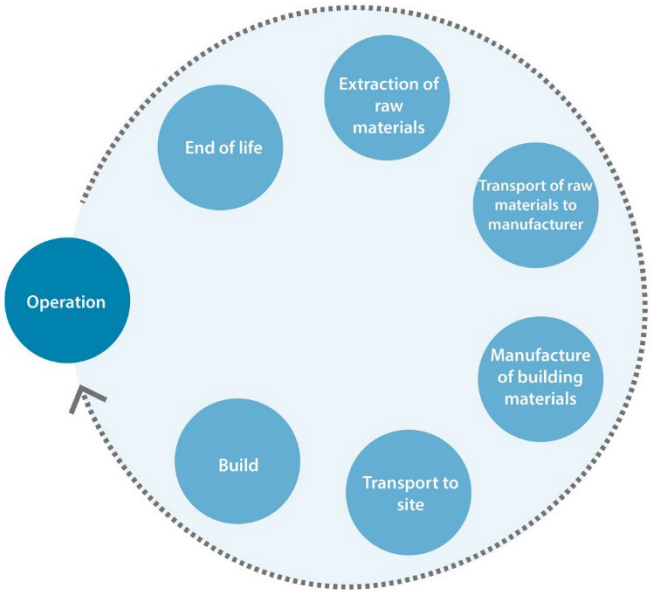

Figure 2.3: Represented that the Embodied Energy in Building Materials

It's crucial to remember that there are two categories of carbon emissions related to construction: operational and accumulated. Instead of only the carbon dioxide emissions generated by the building's materials, the latter includes all carbon dioxide emissions generated by a building's operations, including power use, heating, cooling, and more .

It's crucial to understand how much energy or carbon is contained in the building's components if you would like to design initiatives that will be more environmentally friendly. Due to local availability and the sort of movement needed, a "sustainable material" in one location may entail a high energy burden in another. The Life Cycle Assessment is a systematic method for analyzing the environmental effect of buildings, from the extraction of resources and production of goods through to the end of their useful lives and final disposal. Numerical figures that describe the effect categories as well as enable comparisons between similar information are generated using a specific methodology. A list measuring the energy content of the most widely used materials worldwide is being put up by the University of Bathwith a similar goal in mind .

Other technology and tools are also available, and they guarantee to speed up the procedure. The Embedded Carbon in Construction Calculator tool was created by Autodesk in association with the Carbon Leadership Forum and other architectural and software businesses. It is now accessible to all beta users. The goal is to provide individuals with the understanding they need to make more informed choices about the amount of carbon that each component of a building symbolizes, encouraging considered, mindful, and approachable answers even for non-specialists. The quickest method to make activities more intelligent and economical is always to make choices with awareness including being aware of the possibilities presented .

Exemplified Vitality of Building Materials

The total amount of non-renewable or primary energy utilized over a building material's full life cycle, spanning extraction, production, development, maintenance, and disposal, is described as

the embodied energy of that component. In other words, it represents the complete amount of emissions of greenhouse gases linked to the substance throughout its existence in Figure 2.4.

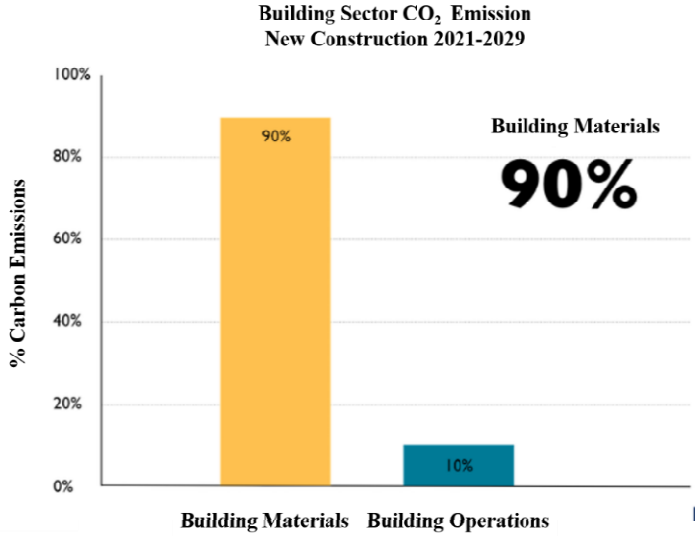

Figure 2.4: Represented the CO_2 Emission in New Building Construction.

Embodied energy seems to be a metric used to evaluate a neighborhood's life cycle and is closely tied to that same built environment's sustainability.

Types of Embodied Energy or Embodied Carbon

Embodied energy or carbon emissions are studied and measured concerning the buildings as:

1. Initial Embodied Energy
2. Recurring Embodied Energy
3. Operational Energy
4. Initial Embodied Energy

This is the non-renewable energy used for building, transportation, manufacturing, processing, and raw material acquisition. For instance, the mining of the ore, production, shipping, manufacture, and transportation to the construction site all need initial embodied energy. The origin, kind, and properties of the construction material have an impact on the initial embodied energy .

Recurring Embodied Energy

During the building's lifetime, it refers to the non-renewable energy used for upkeep, repair, restoration, rehabilitation, or replacement of substances, systems, or components. It is controlled by the longevity of the structure as well as the endurance and upkeep of the systems, equipment, and building material put there.

Operating Energy

It is the ongoing energy used in constructions for lighting, ventilation, heating, and cooling, which is either obtained by passive or active energy systems. The operational temperature rises as a structure becomes older, and with time, the original electricity production is no longer meaningful.The construction business is essentially focused on initial embodied energy. For

instance, cement extraction, the greatest source of embodied carbon in architectural design, and the most prevalent human-made medium in the world, concrete, together produce around 7% of the global CO_2 emissions.

Mega Joules or Giga Joules per unit of mass or area are calculated to measure initial environmental cost. The location of the manufacturing technology used, the technology innovations and the determination of embodied energy all play a role in this difficult procedure.

Boundary Conditions of Embodied Energy

Embodied energy may be expressed in terms of boundary conditions, according to the Inventory of Carbon and Energy, published by the University of Bath in 2008:

1. Cradle-to-Gate: from the collection of raw materials to the production gate.
2. From the extraction of materials to the construction site.
3. Cradle-to-grave: from the extraction of materials to the end of life.

Cradle-to-Gate boundary conditions are used by ICE to gather broad information about the building material. Cradle-to-Site boundary conditions may be taken into consideration for a thorough study.

The objective of Embodied Energy in Building Materials

The reduction of carbon emissions from buildings should be the top priority for civil architects and architects. For the creation of more environmentally sensitive projects, studying and calculating the embodied energy or carbon contained in building materials is crucial. The Life Cycle Assessment method is a valuable method for determining the elements in a building's life cycle that have the greatest influence on the environment. It could be necessary for the examination to compare several materials that fulfill the same purpose. Compare a steel, hardwood, or concrete frame superstructure, for instance .

Introduction to Bricks in Civil Engineering

Bricks are rectangular, baked clay bricks that are often red or brown and are used to create walls as mentioned in Figure 2.5. These blocks are the component of brick. She constructed bookcases out of boards and bricks.

Figure 2.5: Represented the Structure of Briks.

Characteristics of Good Bricks

The finest brick possible should always be used in the building. Therefore, it is necessary to look into the qualities of a good brick . The qualities listed below are present in excellent bricks in general:

1. Bricks should be the same size, colour, and shape. Brick sizes should stay consistent.
2. They need to be durable and small.

They should have crisp, straight edges and be independent of fractures and other faults including air bubbles, stone nodules, etc. When saturated in water for 24 hours, bricks shouldn't absorb more fluid than 1/50 of their weight.

Bricks should have a strong development between 2000 and 5000 psi. Brick loses durability because of salt assault. Furthermore, efflorescence in brick is brought upon by an excess of soluble salts. In brunt bricks, the number of chloride ions should not be more than 2.5%. The brick shouldn't lose volume when it becomes wet.

Bricks should not be under or over-burnt. In general, the weight of each brick should be 6 lbs., and the unit weight per cubic foot should be under 125 lbs. Bricks should have a low thermal conductivity since it is ideal for a structure made of them to be warm in the winter and cool in the summer. Soundproof bricks should be used. Bricks should not catch fire and should not burn. Bricks should not have any pitting caused by lime.

Uses of Bricks

In the realm of the civil engineering building, brick is crucial. Bricks are used in building as an alternative to stones. Below are a few of the key applications for building brick.

1. Building walls of any size.
2. Building of storeys.
3. Building cornices and arches.
4. Building a brick retaining wall.
5. Producing Khoa, which is used as an aggregate in concrete.
6. The production of skin, which are utilised in lime concrete and plaster.
7. Density of Bricks

Brick density is an important parameter. Density indicates the weight of the brickwork. Cores, Cells, and Frogs decrease the density and in turn, decrease the material cost.While fire clay bricks have a density of 2400 kg/m^3, for common red bricks it is 1900 kg/m^3. Apart from material density, brick density can be measured directly. The mass and volume of an oven-dried brick are measured. The bulk density can be determined by dividing the mass by volume .

$$\text{Bulk Density} = \frac{\text{Mass}}{\text{Volume}} \text{ in kg/m}^3 \text{or lb/ft}^3$$

Classification and Types of Bricks

Bricks are standard rectangular units in size. Clay is used to making bricks, as seen in Figure 2.6. They are often used in the majority of construction projects. When stone is not readily accessible, bricks are often utilized in their place.

Figure 2.6: Represented the Usable Bricks.

Types of Bricks

Bricks can be of many types depending on:

1. Quality
2. Building Process
3. Manufacturing Method
4. Raw Material
5. Using Location
6. Weather-resisting Capability
7. Purpose of Using
8. Shape
9. Region

Classification of Bricks Based on Quality

Based on quality, Bricks are of the following kinds:

i. First Class Brick

The dimension is typical. These bricks have a consistent yellow or red tint. It has a consistent shape, a regular texture, and is well-burnt. The crushing strength is 280 kg/cm^2, where it is 245 kg/cm^2, and the hydrophilic nature is less than 10%.. There is no efflorescence on it. When hit with a hammer or another brick of a comparable size, it makes a metallic sound. If one attempts to accomplish it with a thumbnail, it is difficult to resist any fingernail expressiveness on the brick surface. It is devoid of organic debris, gravel, or stones . In most cases, it is used:

In a building of long durability, say 100 years;

For buildings exposes to a corrosive environment;

For making coarse aggregates of concrete;

ii. Second Class Brick

Standard in both size and color, it comes in either yellow or red. Even if it is somewhat overboard, it is still acceptable. It has consistent performances and little efflorescence. The absorption capacity is more than 10% but less than 15%. The crushing strength is 175 kg/cm^2, with 154 kg/cm^2 being the lowest. When hit with just a hammer or another brick of equivalent size, it makes a metallic sound. If one attempts to achieve it with a thumbnail, it is difficult to resist any fingernail expression on the brick surface. When the targeted permanence is less than 15 years, one-story residences and temporary sheds are produced using it .

iii. Third Class Brick

The shape and size are not regular. The color is soft and light red colored. It is burnt, and slightly over-burnt is acceptable. It has extensive efflorescence. The texture is non-uniform. The absorption capacity is more than 15% but less than 20%. The crushing strength is 140kg/cm^{2}whereas the minimum crushing strength is 105kg/cm^2. It emits a dull or blunt sound when struck by another similar brick or struck by a hammer. It leaves a fingernail expression when one tries to do it with the thumbnail .

Classification of Bricks Based on Building Process

Based on the building process Bricks are of the following kinds :

i. Unburnt Bricks

These bricks are partially burned. Yellow is the color of this type of Bricks. Low strength is present. As sure, they are used in lime terracing. They serve as soiling for basements or RCC footings. Rainwater shouldn't contact such bricks.

ii. Burnt Bricks

Bricks are turned into burned bricks in a kiln. Bricks from the first, second, and third classes have been burned.

iii. Over Burnt or Jhama Brick

As it is burnt at a greater temperature and for a longer duration of time than standard bricks, it is often referenced to as the vitrified brick. The form is altered as a consequence. The absorption capacity is great. The strength is more than or identical to first-class brick strength. The underpinning uses lime concrete. In concrete construction slabs and beams that won't be in touch with water, it is also applied as coarse aggregate.

CHAPTER 3

COMPOSITION OF BRICKS

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Bricks are rectangular building block components. Bricks are used in paving, walls, and masonry building. When stone is not easily available, it is utilized as a replacement. Brick chips are frequently blended into conventional concrete as coarse aggregate .

Percentage of Constituents of Brick

There are six major ingredients of brick and the general percentage of these ingredients in brick is given below in Table 3.1:

Table 3.1: Represented that the Different Ingredient percentage in Bricks.

Sr. No.	Ingredient	Percentage in Bricks
1.	Silica	56.00%
2.	Alumina	31.00%
3.	Iron Oxide	7.0%
4.	Magnesia	4.0%
5.	Lime	1.0%
6.	Organic Matter	1.0%

Chief Ingredients of Brick and Their Functions

The two major components of brick clay are silica and alumina. It becomes plastic when properly diluted with water. The plastic mass is simple to form and dry. It really doesn't experience warping, shortening, or cracking .

Alumina

Clay's primary component is alumina. It serves as a cementing agent in unfinished brick. Brick clay contains alumina, which makes it flexible. Because of their fluidity, bricks can be shaped. Bricks made of clay that contains too much alumina may shrink, bend, or break when dried and burned as with any other cementing ingredient.

Silica

Bricks of good grade contain 50.0%–60.0% silica. Both the free and mixed forms are present. It continues to be mechanically combined with clay as freesand. It interacts with alumina to create aluminosilicates when mixed.

Raw bricks won't bend, shrink, or break thanks to silica. The brick will be more shapedly and uniformly textured the greater the sand content. However, too much silica damages the cohesiveness between the clay particles in brick, making it fragile and weak. The ideal ratio of silica and alumina is a key factor in brick durability.

Lime

A little quantity of finely powdered lime should be included in the bricks. At the furnace temperature of 1650°C, it allows silica to melt and bonds the brick particles together to produce strong and long-lasting bricks. Lime works as a catalyst at around 1100o C to raise the furnace temperature to 1650o C, which is the temperature at which silica fuses. This silica, which has been partially fused, functions as a robust cement. Bricks will get vitrified if there is too much lime in the brick clay. Bricks melt as a result because more silica than is necessary will fuse. The bricks then develop defects and lose their original form.

Iron Oxide

Iron oxide is a minor component of bricks. Iron oxide functions as a flux similar to lime and aids in the low-temperature combustion of silica. Upon burnt, it gives stones a crimson hue. The bricks' strength and absorption coefficient are both strengthened by iron.

Magnesia

A minimal amount of magnesium reduces shrinkage and gives the bricks a golden color. It makes bricks disintegrate when there is too much of it.

Classification of Bricks Based on Manufacturing Method

On the basis of manufacturing method bricks are of the following kinds:

i. Extruded Brick

To make it, clay and water are compressed into a steel die that has a highly precise form and size. The resultant column is then separated into shorter components using wires before being fired. It is utilized for projects with tight financial constraints.It comprises three or four holes, which may be responsible for up to 25% of the brick's volume .

ii. Molded Brick

Instead of being manufactured by machine, it is manually molded into a casting. Molded Bricks are readily available in 50.0mm-65.00mm range. Other sizes and shapes can be obtained and will be shipped 6 to 8 weeks later.

iii. Dry pressed Brick

It is one of the classic methods of making bricks, which involves pressing clay into molds. On one of the bedding platforms, there is a deep frog, and on the other, a shallow frog .

The ratio of the people living in rural and urban regions is drastically out of balance as a consequence of the globe being substantially more urbanized over the last several decades. According to estimates, roughly 50% of the world's population lived in urban areas in 2010. Extended urbanization, which often results in the loss of natural resources and the environment, is a serious issue for many nations. Certainly, the growing global population and increasing urban population need more home building. One of the most important factors in socioeconomic growth is the construction industry. Several authors and international organisations have addressed this topic, with many of them emphasizing developing nations. Yet, the importance of building in developing nations is often far lower than the need for housing, infrastructure, and other amenities. In major metropolitan areas, the need for housing is obviously more pressing than the need for building materials.Wells estimates that construction operations for housing, buildings, and civil engineering make up around 30%, 50%, and 20%, respectively, of the total cost of construction. The growth of the CI in DCs must thus prioritise finding solutions to the housing sector's issues. Building materials, which make up 50% to 80% of the value of all building, play a significant role in how the construction industry responds to the demands of human habitation. The suitability of BMs and alternative technologies, on the other hand, is a key consideration when investigating the issues with the building materials industry as they relate to the supply of housing. The main issue with BMs in DCs is their reliance on imports. Also, a lot of DCs rely heavily on foreign equipment and building know-how. The poor competitiveness of locally produced materials is blamed for the reliance on imported resources. Locally manufactured materials in DCs often exhibit poor productivity, bad quality, excessive prices, and insufficient production. The low output and variety of indigenous materials are caused by the use of improper methods in BM manufacturing. Moreover, the traditional sector's low capacity for large-scale input purchases and its constrained access to finance and loans support the sector's small-scale manufacturing. Being a developing nation, the Sudan has seen a noticeable improvement in its economic performance since the end of the 1990s, which is attributed to oil production. For the previous ten years, real GDP growth had an estimated average annual growth rate of roughly 7%.. In an effort to achieve equilibrium between supply and demand in the real estate market, particularly for housing, building activities have increased dramatically as a result of the better economic performance and the restricted availability of architectural space. During the last ten years, the production of the construction industry has grown by an average of 5% in real terms, with a 45.5% compound growth rate. Over the same time period, the construction sector's average contribution to total GDP was 4.7%. The growth of the construction industry has increased demand for the manufacture of construction goods and materials. A few manufacturing facilities have been developed in an effort to address the scarcity since the majority of the critical BMs were, and still are, imported from other countries. In the Sudan, research on construction materials and technology began a few decades ago. In 1979, the Building and Road Research Institute at the University of Khartoum conducted a thorough pilot study reviewing the general characteristics of the Sudanese Construction Industry and the Sudanese Building Materials Industry. This study was done in collaboration with Battelle Institute in Germany. According to the report, the SBMI is characterised by its dependence on imports, centralization of manufacture, underutilization of resources, delays in construction caused by an ineffective transportation system, a shortage of suitable materials, and very high BM costs. The study's goal was to determine if there was a way to meet the demand for BMs with suitable local goods. Sadly, neither the study's findings nor its suggestions have ever been

put into action. Although others focused on researching indigenous materials and technology, including using earth to construct with. Research on BMs is often quite restricted, and the majority of conclusions and suggestions have not been effectively adopted or disseminated

There are several obstacles preventing the growth of the building sector in emerging nations. International institutions as well as scholars, professors, and professionals have looked at this subject in great detail. The issues preventing the establishment of the CI in DCs have been classified by several studies. Almost all researchers have a tendency to group similar elements under several categories. According to Wells, the issues facing the CI in DCs include: a lack of competent labour; high and growing costs of BMs; a shortage of BMs; limited local production of BMs; poor quality of locally produced materials; strong dependence on imports; and little engagement of local contractors. There is broad agreement that many DCs indeed experience many of these issues. Setting CI development policies, however, is a matter that varies per country rather than being a set of guidelines that apply to all nations. Regrettably, a lot of DCs have not examined the size and quality of their building businesses, therefore these sectors are still developing. Fore contends that since these issues are not given priority, many DCs struggle to create their CIs. To expand the whole sector, it is crucial for each nation to determine the areas that need greater attention and immediate action.

The Sudan, like many other developing countries, has significant issues with its building industry, such as excessive construction prices, cost overruns, delays, a shortage of experienced personnel, and poor quality of construction work. There has never been a thorough investigation of the relative significance of these issues and how they relate to one another. Without a doubt, it is essential for the development of the CI to prioritise these issues and comprehend how they interact. The development of local building materials is still usually one of the obstacles to the growth of the construction industry in developing countries. Building materials are one of the most important factors to take into account in DCs where the informal sector predominates in the supply of housing for middle- and low-income classes. Hence, it is anticipated that one of the potential answers to the supply of urban housing as well as rural housing is the search for alternative materials and construction methods that are inexpensive for the middle and low income levels. Theoretically, governments should be able to solve the issues brought on by the high prices and unavailability of imported BMs by substituting them with conventional LBMs. Hence, in order for the construction industry to play its proper role in the socioeconomic development of the country, it is necessary to improve its capacity via the development of locally produced materials. In this context, the SBMI's growth depends heavily on evaluating the possibilities of locally produced materials. Natural materials needed to produce numerous BMs are abundant in the Sudan, but their use has been severely constrained by the country's vast area, poor economic infrastructure, harsh climate, and long-standing political unrest.

The choice of BMs in the Sudan is often made based on their initial costs rather than taking into account the ongoing expenses associated with such materials, as well as their properties and environmental effect throughout the course of a building's whole life cycle. The right materials should be readily accessible nearby, energy-efficient, and environmentally friendly. A step towards the realisation of sustainability principles in construction will be made with the inclusion of such factors in the selection of suitable materials. Technology transfer strengthens the technical capabilities of the construction sector, which is crucial and beneficial to many DCs. In order to be successful in their efforts to alter the current state of their CIs, Water Meyer advises

DCs to create the necessary technologies. Notwithstanding the extensive study that has been done on the creation of materials and technologies, Ofori contends that DCs have had little success in adopting them. This can be linked to the inefficiency of transferring such technologies and spreading information about them. In fact, technology transfer might be used to develop the CI in DCs as well as to adopt suitable and economical construction materials and technologies. The issues that DCs confront in terms of technology selection are best summed up by Hayles and Kooloos as blending locally produced, sustainable materials with suitable and sustainable new technologies that creatively address building demands. Despite being very promising, several technologies are underutilised and not embraced in DCs. The process of transferring effective construction technology to DCs is hampered by several issues. There has never been any research done on the variables affecting successful TT in the Sudan. Programs for the development of the construction industry should include many strategies, including self-reliance, import substitution, the development and use of relevant technologies, and technology transfer, according to Ofori. Thus, it is crucial to comprehend how the variables influencing the growth of LBMs and those impacting the construction industry in general interact in order to build the Sudanese construction industry. As a result, the sector urgently needs to evaluate its development prospects and identify the major obstacles to long-term growth. Exploiting TT in the age of globalisation is one approach to advance a nation's indigenous culture. So, knowing what influences the effective transfer of technology will aid in resolving many of the issues facing the construction industry.

The Contribution of the Construction Sector to National Socioeconomic Development

One of the primary engines of development in every economy has been recognised as the construction industry. It offers the infrastructure necessary for other economic sectors to grow as well as housing, a fundamental human necessity. The nation's economy is fundamentally dependent on the supply and upkeep of housing, other permanent buildings, and infrastructural networks. There is some element of building in practically every economic sector, including agriculture, health, industry, and communications. In order to grow additional productive activities, physical facility development is also crucial. The construction industry's contribution to meeting the demand for construction output created by its sister industries in the economy is what gives its significance. In that regard, the CI is extremely similar to the service sector and considerably boosts economic growth. As a result, the building industry plays an essential and unavoidable role in the survival and economic growth of countries. The next chapter presents broad definitions for the CI and puts the light on its significance in the socio-economic development of countries. It specifically highlights how important the CI is to the economies of DCs. Moreover, it highlights the significance of the building materials industry, since building materials make up a considerable portion of the value of construction. Due to the extensive range of economic activities that the construction industry encompasses, defining its limits is a difficult issue. Construction, according to Wells, is the process of building physical infrastructure, superstructures, and associated facilities. Hence, it includes all civil engineering projects, all kinds of new construction, as well as upkeep and repair of existing buildings.

According to Turin, building has the following characteristics: immobility, singularity, weight, mass, complexity, lengthy manufacturing process, high cost, and durability. Although some of them could be shared by other sectors, he noted that no other product shared all of them. According to Moavenzadeh, the characteristics of building goods include their custom-built

nature, immobility, high initial cost, complexity, and ongoing technological change. Construction merits distinct treatment because to the properties of construction materials and the broad range of activities the CI encompasses. Construction is referred to as "the wide process/mechanism for the realisation of human settlements and the production of infrastructure that supports development" in the CIB Agenda 21 for Sustainable Construction in Developing Countries. This covers the procurement and processing of raw materials, the production of building supplies and parts, the cycle of construction projects from feasibility through deconstruction, and the administration and maintenance of the built environment.

The CI must meet the need for:house construction; building construction for commercial, social, and other applications; heavy engineering construction; and industrial construction, including factory construction, among other things. As a result, the range of necessary projects that are needed in every country's existence increases the significance of the CI. Construction, with its broad scope, becomes a fundamental component of socioeconomic growth. As a result, the CI is seen as a must for economic development and growth have defined the CI primarily in terms of what is or is not included in measuring the output of the industry. However, an operational definition of the CI should include firms and individuals involved in planning, design, and the supply of building materials, plant, and equipment. These definitions, however, can only be applied to construction as a whole, which can only be regarded as a single industry to the degree that the services provided and the technology utilised across diverse building types are comparable. There are several sub-industries that might be seen as falling under the primary industry notion rather than just one. Ofori defines the building business as "having multiple diverse sectors creating heterogeneous goods, which are stationary, complicated, durable and expensive".

The characteristics of an efficient and functional industry that is effectively integrated with the larger economy are reflected in the definition of the CI. As a result, the CI is seen as a must for economic development and growth. Construction is an industry that provides the physical infrastructure facilities, therefore it has a significant influence on economic growth and is essential to and prominent in the development process. According to Turin, the significance of the CI is due to three key characteristics: first, its scale; second, the fact that it primarily offers investment products; and third, the fact that the government is a significant customer of the sector. In other words, nations desiring long-term development and expansion must establish a productive and efficient construction sector.

The Contribution of the Construction Sector to the Growth of Countries

Construction stimulates economic growth across the board and drives international progress. By achieving some of the fundamental development goals, such as output production, job creation, income generation, and redistribution, it aids in economic growth. The only economic sector that is included in both the Gross Domestic Product and the Gross Domestic Capital Formation in the national accounts is the construction industry. Moreover, the International Labor Organization includes a distinct category in labour statistics reports for employment in the construction industry.

Typically, the CI ranks among the major sectors in terms of investment, employment, and GDP output in both emerging and developed nations. Numerous authors and international organisations have discussed the role of construction in socioeconomic development, many of

whom have concentrated on developing countries, including Turin, Strassmann, Drewer, Wells, Ofori, World Bank, and ILO. Using cross-country comparisons, Turin, Strassmann, and Wells all discovered a link between construction investment and economic development. In a recent research, the studies that looked at how the CI affected economic growth during the last four decades were evaluated. The results of these investigations showed a clear connection between DC economic development and the CI. The connection between the construction industry and the economy, as well as the cross-sectoral connections between the industry and other sectors, both contribute to the CI. The literature has made obvious that there is a forward and backward relationship between the construction industry and other economic sectors. Several studies used input-output analysis to compare the performance of the construction industry to other sectors, demonstrating the strength of its forward and backward connections in various nations. There are relatively few studies on DCs, and the majority of studies on the forward and backward connection of the CI are focused on industrialized nations. Miller and Blair demonstrated the input-outputanalysis principle by reporting a building project's output multiplier as high as 2.2. In terms of its contribution to the Gross National Product, national income, direct and total backward and forward linkage indicators, and direct and total inputs from the manufacturing and service sectors, Bon and Pietroforte compared the output of the construction sector in the United States, Japan, Italy, and Finland.

The contribution of the construction industry to the Turkish economy and its connections to other economic sectors were analysed by Bon et al. in 1999. The performance of the building industry in eight highly industrialised nations—Australia, Canada, Denmark, France, Germany, the Netherlands, Japan, and the USA—during the 1970s and 1980s was examined by Pietroforte and Gregori. The similar approach was used by Rameezdeen et al.And was based on five input-output tables created for the Sri Lankan economy. Using input-output figures for the years 1998 and 2002, Ilhan and Yaman examined and contrasted the performance of the construction industry in Turkey and a number of other European Union nations. The output multiplier and input multiplier of the construction industry have both been calculated in the aforementioned research. They both came to the same conclusion, namely that the construction sector's apparent backward connectivity to the rest of the economy is far stronger than its apparent forward linkage. Duccio Turin highlighted the link between building activity and economic development in the 1960s of the previous century. A favourable association between the production of construction and economic success measures was found using statistical data from 87 different nations. To study this connection, a set of indicators was created. These indicators are: Strassmann carried out an analysis with conclusions that were comparable to Turin's. Construction value added as a proportion of GDP, gross production of construction as a percentage of GDP, and employment in construction as a percentage of the economically active population all show a positive association with GDP per capita. Nonetheless, it was shown that in high-income nations, building production slowed down or even stopped contributing to GDP. According to Strassmann, as the economy reaches the medium income level, the building industry's contribution to the economy tends to decline. It has been noted that the building industry may not keep up with GDP growth at a certain point in development and as a result contributes less to economic growth. These investigations have garnered criticism for a variety of reasons, such as the validity of the data, the scope of their coverage, the analytical techniques used, and the conclusions reached. Drewer noted that when resources are misallocated, greater building does not always translate into stronger economic growth. He came to the conclusion

that for construction to contribute to development, its output's structure and the way its supply resources are organised must be consistent with the unique goals of each country. In addition, he noted that the economy may suffer if the CI were to be expanded beyond its ability to absorb the product of building.

According to Lopez et al. the link between the GDP share of construction and GDP per capita growth seems to be compatible with only a recessionary economy. Drewer's views are shared by a number of authors, according to Giang &Peng. According to Kumaraswamy, underdeveloped CIs run the risk of forcing countries into a downward economic loop by wasting scarce resources on premature facility replacement or renewal. The misallocation of resources, the unstable and uncontrolled growth of the industry, the impact of politics on decision-making, and the oversupply of construction and infrastructure were all factors that contributed to the conclusions about the negative effects of the construction industry on the economy. Due to the nature of the circumstances that led to such results, it might be claimed that the adverse effects of the CI on the economy could not be broadly generalised. For instance, there won't likely be any negative effects if the demand for building and infrastructure is precisely predicted, provided appropriately, and in accordance with the economy's capacity to absorb it.

By using statistics on the CI in various nations, Wells has supported the previous conclusions of Turin and Strassmann. According to Wells' analysis, there is a clear positive correlation between GDP per capita and three different measures of construction activity, namely:value added by construction as a percentage of GDP; capital formation in construction; and employment in construction as a percentage of the total economically active population.

According to Wells, the value contributed by construction as a gauge of industrial success often understates the sector's economic impact. The value added is defined as "the difference between the value of sales at market prices and the market value of all current purchases," which excludes the value of purchased building materials and components, fuel, transportation, professional services, and legal fees. This is the definition on which he based his argument. Wells also pointed out that underestimating the importance of construction is caused by the omission of repairs and maintenance work, which accounts for perhaps a third of the sector's overall production.

The multiplier impact of construction activities on-site is estimated to be 2 to 2.5 times the net value of construction production. In other words, every dollar invested on building might result in up to three dollars' worth of extra economic activity. Wells suggests that the contribution of building to the economy would decrease as the number of construction goods became adequate to increase the productive capacity of the economy at a stable growth rate, which is in accordance with Turin's and Strassmann's findings.

Crosthwaite reached results on the global construction market that concur with those of Turin, Strassmann, and Wells. Instead of considering value created in building, he used statistics on construction costs. 150 nations were divided into three income groups: least developed, recently industrialised, and advanced industrialised nations. Crosthwaite discovered a somewhat robust nonlinear link between construction expenditure as a proportion of GDP and GDP per capita, in contrast to Turin and Wells who found a linear association between construction as a share of GDP and GDP per capita. Non-linear correlations suggest that the building industry's contribution is not infinite. According to Crosthwaite's theory, rather than during the early phases

of economic growth, the percentage of GDP devoted to building peaks during the NICs stage "middle income bulge". According to the research, construction expenditure fails to retain its percentage of GDP when nations go from NICs to AICs status, and as a result, its significance decreases. This finding is consistent with Turin, Strassmann, and Wells' assertion that, at a certain point in development, the expansion of the construction industry does not keep up with that of the GDP. Therefore, there is just a relative drop in building production in AICs, not an absolute fall. On the other hand, the increase of construction expenditure and GDP growth often have a linear connection with a positive association. LDCs have the quickest increase in building whereas NICs show the highest rates of construction investment as a percentage of GDP. In terms of construction expenditure as a percentage of GDP and construction spending growth with negative rates of growth, AICs came in third. Conclusion: For all categories, building grows/declines faster/slower than GDP. Once again, this data supports Turin, Strassman, and Wells' hypotheses that, in the early phases of development, building comes before economic growth. According to a recent research by Pheng et al., there is a correlation between changes in construction and GDP, population, agriculture, and industry during a 20-year period in 25 European Union nations. According to the research, these elements have a significant impact on how the CI functions and develops in an economy. The correlation data, in particular, imply that the linkages between construction and other economic indicators would seem to be less obvious the bigger and more economically developed the nations are. Yet, larger relationships tend to be supported by nations with lower GDP and building output. The analysis confirms Turin's findings, which show that nations with lesser building volumes are ones with relatively greater mean annual growth. Every time there is economic development, according to Wells, there must also be a sharp increase in building activity. For instance, infrastructure investment is seen as a way to manage violent conflicts while also having the capacity to stabilize war-torn nations and promote peace. As a result, the creation of sustainable infrastructures might be used as a pre-war and post-war strategy aimed at preventing and resolving conflict's root causes. According to Weddikkara and Devapriya, political stability in terms of civil wars is a crucial factor in determining a nation's chances for long-term growth. It is commonly acknowledged that building plays a crucial role in creating the physical infrastructure foundation for socio-economic growth. Building materials are often thought of as capital goods, and in many nations, construction investments account for around 50% of total capital goods investments. The construction industry still constitutes the principal investment in human settlements, accounting for roughly 80% of gross fixed capital formation, despite its failure to provide basic demands for infrastructure, homes, and other structures in DCs. So, it is possible to refer to the building industry as the foundation of the growth process. While housing and infrastructure investments account for a large portion of construction in developing nations, repair and maintenance activities take on increasing importance in developed nations, making up nearly 34% of all construction. In DCs, repair and maintenance have not gotten the proper attention

Other important contributions are made directly, indirectly, or both to the economy beyond the direct effects of the CI on the economy via infrastructure provisions in terms of employment and revenue production. The CI continues to be highly labor-intensive in the sense that it requires more employees per unit of output than most other sectors, notwithstanding recent advancements in technology and production management methods. The CI employs a very varied variety of individuals from a wide range of occupational cultures and backgrounds, including those in unskilled, craft, management, professional, and administrative roles. The CI is a people-reliant

industrial sector. For newcomers from the countryside and those with little education or experience, the CI offers a traditional point of entry to the labour market. In terms of the flow of money to society, Wibowo exemplifies the process through which the CI contributes to the economy. According to Turin, the employment percentage for the construction industry varies from 2-6% in developing nations to 6-10% in developed nations. For instance, in Italy, the output of the construction industry accounts for around 8% of GDP, 41.9% of national fixed investment, and 25% of all industry employment. It also accounts for 7.9% of all economic sectors. Construction employment could account for up to 10% and 15% of total employment in developing and industrialized countries, respectively, if the employment in the delivery of material inputs were included.

CHAPTER 4
CONSTRUCTION OUTPUT MEASUREMENT AND INTERNATIONAL COMPARISON

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Without a doubt, evaluating the CI's performance is essential for its growth and improvement. Use and use of benchmarking is one strategy for enhancing CI performance. Benchmarking might be used to compare performance among nations in order to build and improve the CI. Several programmes are being used to establish benchmarking in the CI at the organisational and project levels in nations including the US, UK, Canada, Australia, and the Netherlands.

According to the percentage that gross construction production contributes to the national economy, construction sectors are sometimes classified as major or small. The majority of research evaluate the CI's effectiveness in terms of its economic and socioeconomic relevance. The three primary techniques used to gauge the CI's economic impact are value addition in construction, capital creation in construction, and gross production of construction. Economic indicators might be effective in determining how well the CI is doing in a certain nation. Nevertheless, Meikle & Grilli contend that it may not be accurate to compare the state of the CI among nations using economic measures. The inability to accurately measure building production lends credence to this claim. First of all, since there are considerable regional variations in the construction output components. Since there is no internationally agreed standard definition and there are regional variations in what is included and omitted, construction output statistics do not have a uniform substance. An illustration of the variations in the mix of construction output between Finland and the UK. Second, when carried out by the informal sector, building activities are often estimated rather than formally measured. However, statistics on construction production and the national economy vary per country in terms of availability, accuracy, and dependability. In rich western countries, employing economic indicators is sufficient, but in emerging or transitioning economies, when statistics on both construction production and the national economy are especially hazy, it may not be as useful. This claim is made by Drewer as the principal objection to Turin's findings on the contribution of building to economic growth and development.

The Globalization of the Building Industry

The so-called least developed countries, recently industrialised countries, and advanced industrialised countries are the three primary economic divisions into which the world's nations are often grouped. Instead, low-income and middle-income nations are used to describe LDCs and NICs, respectively. LDCs and NICs are often categorised as developing nations and referred to as "dependent," "non-industrialized," "poor," or "the third world countries". As opposed to AICs, which are often described as "advanced," "industrialised," "independent," or "wealthy" nations. The global construction market uses the same economic grouping as the nations of the globe. According to projections for 2007, the worldwide construction industry is worth over US$ 4.7 trillion annually, growing at a compounded growth rate of 46% from 1998, when the global

construction output was expected to be worth over US$ 3.2 trillion. The "industrialised" and "developing" nations' share of the building activity is very unequal. Since the late 1960s, wealthy nations have controlled 80% to 90% of all building activity worldwide, either directly or indirectly via their contractors, design advisers, and material suppliers. Wells has shown the distribution of world construction production during a 20-year period across nations as characterised by their economic systems, based on a study carried out by Drewer. With a declining percentage of planned economies in both developed and developing nations, the data set demonstrates that the building production has grown more concentrated in developed countries. In 1990, developed market economies had strong rise in their share, which was 20% greater than in 1970. Hence, Drewer contends that Turin's claims are no longer justified based on this information. Nevertheless, Drewer's analysis might be criticised for focusing exclusively on the absolute proportion of developed market economies while neglecting the sharp decline in the proportion of developed planned economies from 31% in 1970 to 8% in 1990. Moreover, during the same time period, the percentage of emerging market economies rose by 4%. The findings show that the percentage of DCs in the world's construction production rose from 11% in 1970 to 14% in 1990 when the shares of market and planned economies for developed and developing nations are combined. As a result of the developed nations' share falling from 89% in 1970 to 86% in 1990, the percentage of DCs increased. As a result, Drewer's defence of Turin's claims is invalid. The fall of the Soviet Union towards the end of the 1990s may be responsible for the reduction in the proportion of planned economies, particularly in the developed world. The distribution of worldwide production in 1970 and 1990 is shown in Table 2.4 below.

Many studies have provided further evidence of the growing contribution of DCs to the world's production of building. According to an ILO research from 2001, the construction production of developing countries climbed from 8% in 1965 to 23% in 1998 as a percentage of the world's output. Nonetheless, and in spite of the growing contribution of DCs in the world's construction output, these proportions do not seem to be in line with the population size of DCs. According to statistics, DCs are home to around 85% of the world's population, although they only account for 25% of global building production. The uneven population, GDP, and construction production distribution throughout the world's regions is seen in Figure 2.7. Production is mostly concentrated in high-income nations, which spend far more per person in building than do developing countries. For instance, France, which accounts for 15% of all building in Western Europe, is rated second in the European Union and sixth overall in terms of production.

High-income nations in Europe provide a large contribution to the global output of construction notwithstanding the slowdown in their economic development and the general drop in their building volume. The United States leads the worldwide scene with the biggest construction market, followed by Japan and China, which is anticipated to surpass Japan in the near future despite the negative increase in construction expenditure. With over 12% of global construction expenditure and over 9% annual growth, China is experiencing a booming construction business. Chinese participation in the global building market had equivalent shares of 2% in 1965 and 6% in 1998.. In terms of worldwide construction expenditure, India has remained in place at number 13 between 1998 and 2007.. Yet, it is noteworthy that India, which didn't rank among the top 20 nations in 1998, trailed China in terms of the increase of construction expenditure in 2007, with an annual growth rate of nearly 8%.. In general, NICs have greater rates of yearly increase in

construction expenditure than AICs; China, India, Brazil, South Korea, Germany, the UK, and Japan all have higher rates of growth than the USA, which is 2%.

On the other hand, the employment distribution is virtually exactly the opposite of the production distribution, with three-quarters of the estimated 111 million construction workers worldwide working in developing countries, and the remaining one-quarter in industrialised nations. Nonetheless, employment is still rising in emerging nations, whereas it has steadied or even decreased in many wealthy ones due to production stability and a tendency towards automation and prefabrication. In other words, employment in the construction industry tends to stabilise or drop in nations with capital-intensive sectors, but it tends to rise in nations where labor-intensive building is the norm. The employment percentage of the construction industry generally exhibits the same trends as that of its economic contribution.

From above, it can be deduced that the "employment intensity" of the construction industry is much larger in low-income nations than in high-income ones. Nonetheless, the proportion of employment in the construction industry as a whole is larger in industrialised nations than in emerging nations. The disparity between production and employment in developed and developing nations may be due to the greater value of output produced per worker in developed nations as opposed to DCs, where wages and material prices are cheaper. This notion is confirmed by the fact that, in 1998, the average construction production per employed worker in low-income countries was $8,507, compared to $79,623 in high-income countries, notwithstanding the concentration of worldwide construction employment in DCs. The shares of the CI subsectors vary significantly between developed and developing countries, with the majority of DCs investing heavily in infrastructure and civil engineering projects on the one hand, and most developed countries investing in residential and nonresidential projects on the other.

The Function of the Building Sector in Emerging Nations

According to estimates of worldwide construction production, the proportion of DCs in that output quadrupled in 1998 to reach 23%, up from 8% in 1965.. In comparison to their percentage of the worldwide population or the employment in the industryDCs' contribution to the global construction output is excessive. In most DCs, the percentage of the CI in the overall GDP is larger than the percentage of manufacturing. Yet, it should be recognised that socioeconomic growth possibilities and potentials vary across DCs. These nations' CIs vary in terms of their capacities, potential, and size. As a result, not all DCs experience construction's considerable economic contribution; in the majority of sub-Saharan nations, CI accounts for less than 5% of GDP. The equivalent average for wealthy nations is 7%.. For instance, from 1996 to 1998, the average yearly construction investment as a percentage of GDP in Equatorial Guinea topped 57%.. Interestingly, neither the average annual growth rate of construction expenditure nor GDP growth included the nation among the top 20 nations. Thanks to the CI, certain nations have seen tremendous socioeconomic improvement, enabling them to become NICs. On the other hand, several of the DCs have seen declining trends in the GDP proportion of value added in construction.

DCs have seen a dramatic increase in both the output of and employment in construction over the past 30 years, even in the absence of real economic growth, in contrast to what is seen in mature economies where the share of the CI in GDP has decreased and the rate of growth in construction

output tends to slow down. It's noteworthy to note that the percentage of construction in overall GDP and employment may increase in less wealthy and less developed nations. Studies show that, in the majority of DCs, building rises more quickly than GDP, indicating that the GDP elasticity of construction is higher than one. Wells used a broad investigation to determine the average yearly growth rates of GDP and building over a 20-year period. The data showed that building production increased at a pace twice as fast as GDP in the Middle East, South America, and Africa. In mature market economies, however, building production rose more slowly than the whole economy. In certain nations, the growth rate of GDP was practically double by the growth rate of building production. Remarkably, at that time, certain DCs had exceptional increases in the production of the building industry. According to Wells, DCs may gain by emulating Europe's post-World War II development patterns, when construction production tripled in 20 years and placed a significant burden on the sector. Nonetheless, growth rates are remarkable and do begin from a very low foundation, it should be stressed. The fact that DCs consistently top the list of nations when looking at annual construction expenditure as a percentage of GDP and annual construction spending growth shows just how significant construction is to DCs' economy. Yet, the construction sector is seen to be far from acting as a "driving force" for growth despite the growing proportion of DCs in global building production. It should be highlighted that the informal sector performs a significant percentage of building activity in DCs. Also, it is thought that the demand for housing in DCs is rising faster than those nations' ability to provide it. Hence, between 30 and 70 percent of the urban housing stock in low- and middle-income nations is unlicensed or illegal. "Engineering without Engineers" is how de Bustillos refers to the creation of spontaneously formed informal communities. Hence, the production of construction by DCs will undoubtedly be significantly larger if the output from the informal sector, which is commonly ignored/omitted from national statistics, is taken into account.

The Issues the Construction and Building Materials Sectors in Developing Countries Face

With its unique issues and needs, the construction sector encounters issues and obstacles worldwide. Challenges in developing nations are distinct from those in wealthy ones in both nature and setting. The next chapter gives a basic overview of the building sector in emerging nations and lists the challenges to its growth. It examines the efforts made to categorise the CI issues in DCs.

The construction sector is well recognised for encompassing a broad range of operations and may thus be divided into many categories. Certainly, various construction-related tasks call for various tools, know-how, and abilities. Torino started classifying building projects in DCs according to the resources and technology they used. In his matrix, Turin divided the CI in DCs into four primary categories: the international modern; the national modern; the national conventional; and the traditional. Turin's matrix is helpful in that it makes it simple to identify the resources that restrict different sectors and, therefore, calculate their combined capacity. Also, it should be emphasised that there is some overlap and that these sectors' borders are not fixed. The suggested matrix makes it easier to evaluate the CI in a typical DC and illustrates the potential elements impacting the growth of each industrial sector.

Different needs for design and construction knowledge, varied construction resources, and administrative issues are implied by the categorization of different kinds of projects. Resources,

abilities, and construction materials are required in varying amounts depending on the category. The "international-modern" carries out large-scale projects and needs highly specialised plants, equipment, highly experienced specialists, and skilled personnel. Foreign companies dominate the industry. The "national-modern" responds to both public and private demand for medium-sized urban structures in metropolitan centres that need for some imported equipment and labour. The work in this area is often performed by local contractors. The "national-conventional" construct the majority of private homes and rural infrastructure in urban and semi-urban areas using a combination of conventional materials and methods together with a few carefully chosen contemporary inputs. The "traditional" category, which mostly functions outside of the monetary system, predominates in rural regions and, in certain circumstances, in the spaces between rural and urban towns.

Drewer created a classification for building in DCs that followed Turin's lead. Unlike Turin's matrix, which classifies building projects according to the amount of demand they meet According to Turin's classification, projects in the international subsector are typically: infrequent, large, and technically complex; financed with foreign aid; designed abroad; invited to participate in international tenders; and employ sophisticatedskilled professionals and managerial personnel, plant, equipment, materials, and components. The government and sometimes a very large local or international organisation serve as the customer.

Less complex and more often occurring than those in the international sector are projects in the conventional-large sector. They often include both building and civil engineering projects and are carried out by both domestic and foreign-owned construction companies. They need foreign machinery, plant, and equipment, as well as technical, managerial, and trained workers.

A combination of conventional and locally created materials are used in the conventional-small/medium sector projects, which are mostly labor-intensive. They provide room for the growth of small contracting businesses that deal with the whole spectrum of challenges that the CI in DCs presents, as well as the introduction of locally created materials and their manufacturing. Public and private investments are often made in this industry.

The projects in the self-help sector employ the same resources and methods as the traditional small to medium-sized projects, but they are not carried out by for-profit construction companies. They are built by the local population in rural regions, maybe with aid from the government in the form of resources like money, working drawings, supervising staff, or building supplies. The industry has the capacity to satisfy the demand for building goods while also spreading and improving management and technical construction capabilities. Outside of the realm of building experts and contractors, the conventional financial sector functions. It mostly offers homes for those living in rural regions. In general, the industry employs both conventional and traditional resources. The customers in the subsistence sector may purchase the housing directly, together with their families, or with assistance from unofficial cooperatives. When their circumstances improve, customers in this group could transition into the regular financial industry.

The classification of the CI in a typical DC based on the types of projects and the resources they needed is consistent both Turin's and Ofori's matrixes. The informal sector is seen by Ofori's matrix as having significant potential in the CIs of DCs. The mix of construction output and the kind of construction technique used have an impact on the need for materials for both matrices.

A single strategy for the construction of any CI will not be helpful since the classification of the CI, as Turin and Ofori showed, shows its variety. The demand for construction output and therefore for resources does not necessarily follow the same trend throughout the CI subsectors.

According to the resources needed, Drewer divided construction output into regular and extra-normal construction. Projects that fall under the category of "normal construction" are those that meet the need for building in a given economy without adding any unnecessary expenditures that could hurt that economy specifically. Contrarily, extra-ordinary building projects are those that contribute to the economy's expenses because they cannot be adequately resourced within a reasonable balance between the use of local and imported resources. Size, technology, and production intensity are factors that determine whether a building project is considered regular or out-of-the-ordinary. So, it is necessary to classify related initiatives in various nations differently because of variations in the CI's capacities in terms of the resources and expertise available. Understanding the needs of the industry as a whole and evaluating its potentials and capacity in relation to each sector is made easier with the aid of the CI's classification in terms of capacity and resources. Planning for the long-term growth of the industry benefits from determining the demand placed on each sector in the context of supply potentials. Also, understanding the issues that each industrial subsector is experiencing makes it easier to establish sector-specific policies and programmes for the improvement of each subsector's performance based on its unique characteristics and potentials. It will be helpful for ranking the sub-sectors in terms of desired actions and improvements.

Goal-setting for Global Governance

The Sustainable Development Goals were established by the UN General Assembly in September 2015 and are a crucial component of the 2030 Agenda for Sustainable Development. The former Millennium Development Goals, which had come to an end in the same year, were to be expanded upon and built upon by the new Sustainable Development Goals. After years of attempting to combine environmental sustainability with economic and social growth, the Sustainable Development Goals represent a significant move for the United Nations towards a single "sustainable" development goal. They also represent the most ambitious attempt to date to make goal-setting the focal point of international governance and policy. Yet, governments' excitement for goal setting is not yet matched by their understanding of its potential or limitations as a form of governance. With a thorough analysis of the Sustainable Development Goals and the governance issues they raise, this book seeks to fill this knowledge vacuum. Goal-setting and sustainability are not innovative methods of governing the world's politics, development, or earth system. The United Nations is strongly anchored in loftier ideals like justice, equality, and peace, among other monumental historical endeavours. Several multilateral agreements and initiatives of international organisations have included goal-setting as a component. Whereas "sustainable development" and "sustainability" were the intellectual pillars of the 1992 Rio Earth Summit, the 2002 World Summit on Sustainable Development, and the 2012 UN Conference on Sustainable Development, respectively. Yet compared to these previous initiatives, the Sustainable Development Goals go a step farther. They provide the idea of sustainable development more particular meaning, identify precise objectives for every goal, and utilise the idea to help construct a more expansive, cogent, and revolutionary 2030 agenda. The Millennium Development Goals' central mission of ending poverty and promoting social inclusion is the foundation of this single, goal-oriented agenda, which aims to create a universal,

integrated framework for action that also addresses the world's increasing economic, social, and planetary complexity in the twenty-first century. Some people may ask whether setting goals is an intentional evasion of the kinds of promises that were made for the Millennium Development Goals after the fact. Others have questioned whether the specific definition of sustainable development in the Sustainable Development Goals offers a solid enough framework for an extensive agenda that incorporates human rights, social and political inclusion, and good governance. Three sets of concerns that drive this book are motivated by a confluence of very high ambition, ambiguous political commitments, and doubts over the capacity of objectives to mobilise political and economic players, as well as the resources needed to accomplish them.

First, the book explores in depth the key aspects of goal setting in global governance, asking whether it is a suitable strategy in global governance and what makes global governance via goals distinct from other techniques such as rule formulation or norm promotion. Second, the chapters examine the circumstances in which a goal-oriented approach can ensure progress in the direction of desired goals, the lessons to be drawn from earlier global goal-setting experiences, particularly the Millennium Development Goals, and the governance structures most likely to encourage advancement in the implementation of the new Sustainable Development Goals. The book also explores the potential for attaining such a challenging new agenda while examining the operational and practical difficulties that come with global government.

The Sustainable Development Goals are a new form of global governance that not only promote sustainable development globally but are also a significant area of research in and of themselves. The Millennium Development Goals' apparent success, which is evaluated critically in many chapters of this book, has contributed to the elevation of goal creation as a governance tactic. Due in part to the very visible and high-level political process that led to the creation of the Sustainable Development Goals, the stakes have now increased for this approach.The Millennium Development Goals were specifically formulated by the UN Secretariat, however they were based on results from several prior UN and other international procedures, as well as consultations with states and UN agencies before and after the 2000 Millenium Summit. The eight clear yet comprehensive Millennium Development Goals and accompanying goals were not agreed-upon results. The Sustainable Development Goals, on the other hand, necessitated nearly two years of rigorous intergovernmental stocktaking and negotiating sessions, as well as perhaps the greatest public and multi-stakeholder consultations in UN history. They serve as the focal point of the larger new UN agenda, "Transforming Our World: The 2030 Agenda for Sustainable Development," which was endorsed by the UN General Assembly in September 2015.. This comprehensive declaration incorporates the results of numerous related international processes, including the third World Conference on Disaster Risk Reduction, which was held earlier in 2015, and the third International Conference on Financing for Development, which was held in 2015. It even has a spot for the document that would later become known as the Paris Agreement after the twenty-first session of the Conference of the Parties to the United Nations Framework Convention on Climate Change. Just before the commencement of the final intergovernmental debate in 2015, the UN Secretary-synthesis General's report on a range of inputs made for the post-2015 development agenda was issued in an effort to construct a vision around which these many streams might cohere. The 2030 Agenda for Sustainable Development also considers how to carry out its ambitious goals, acknowledging that achieving the Sustainable Development Goals will necessitate not only a larger effort through the UN system

but also the mobilisation of political support and funds from a wide range of actors in civil society, the financial sector, and business. In conclusion, the Sustainable Development Goals are intended to "change our world," as indicated by the larger 2030 Agenda for Sustainable Development's adopted title.

We provide a study agenda to evaluate the circumstances, difficulties, and chances for the Sustainable Development Goals to achieve this goal in the next sections of this chapter. We start out by talking about goal-setting as a method of global governance. Second, we explore the distinct character of the modern issues that goal setting as a global governance strategy faces in order to contextualise the Sustainable Development Goals.

At a global level, governments and other political actors create goals to identify and make public shared aims or aspirations in order to accomplish a specific set of goals, or at the very least, to publicly commit themselves to achieving those goals. Governments show their desire in accomplishing international objectives and perhaps being held responsible for doing so by endorsing them by adopting such measures as statements by conferences, summits, or the UN General Assembly. In exchange, goals are often anticipated to contain quantifiable objectives and time intervals for monitoring success. Goal setting tries to create priorities that assist counteract the inclination for short-termism that would pull attention away from longer-term goals. Goal-setting, however, is still a contentious governance tactic. On its usefulness and efficiency, analysts have differing opinions.

The use of aspirational criteria that governments may be ethically judged against is endorsed by many international lawyers. Others assess their worth in terms of laying the groundwork for formal institutional processes that will encourage their dissemination and penalise offenders. Yet, political "realists" sometimes reject goal-setting as a cover for the absence of substantial, legally enforceable international agreements. The adoption of the seventeen Sustainable Development Goals as a whole, along with the even more comprehensive 2030 Agenda for Sustainable Development, provide "scant guidance for prioritising scarce resources," as noted by Underdal and Kim, and there are no hierarchical governance arrangements on a global scale to ensure compliance. However, they, along with a few other authors in this volume, though with varying degrees of caution, highlight the specific institutional and resource-mobilization efforts—some already underway—to concretize implementation at various levels. In certain ways, it is misleading to say that objectives are either isolated ambitions or the basis for meaningful action and longer-term commitments. Several objectives that were first adopted on their own terms eventually had institutional frameworks attached to them. For instance, the United Nations was created in Dumbarton Oaks using formal institutional structures to supplement the basic consensus aims stated in the short Atlantic Charter. As nations get more entangled in a thick web of nongovernmental groups and international institutions that are keeping an eye on and pushing for stricter compliance, the pursuit of international human rights follows a similar evolutionary logic. In general, there are three categories of global goal-setting. At start, some objectives are only aspirational. They may be put out by a small group of nations looking to spark long-term support, or they might represent a broader agreement over shared goals for which governments might be held responsible. Examples include the fight to end slavery in the nineteenth century, human rights, and the so-called "20/20" bargain proposed for the 1992 Rio de Janeiro UN Conference on Environment and Development, which proposed that industrialised nations increase foreign aid while developing nations cut their greenhouse gas

emissions by 20%. In the end, aspirational objectives could have unilateral repercussions because governments may decide to comply for religious or moral reasons. One such aspirational objective is to keep global warming to 2°C over preindustrial levels. It was initially included into a treaty between the EU and other nations, then into a statement by the Group of Eight major economies, and lastly into the 2009 Copenhagen Accord amongst the signatories to the 1992 UN Framework Convention on Climate Change.

It provided a numerical objective that helped to make the abstract goal of the climate convention's stabilization of greenhouse gas concentrations in the atmosphere at a level that would preclude harmful human interference with the climate system"—more tangible. Goals that begin as aspirational but eventually gain agreement and support via formal institutions that get connected to them for their enforcement and institutionalisation constitute a second kind of goal formulation. After these objectives are identified, campaign-style efforts are made to achieve them, and subsequent institutional development is often what happens next. One example would be the Millennium Development Goals. The UN Secretariat later developed a set of criteria to determine if these aspirational objectives had been achieved. Several such instances may be found in international environmental law, where original accords set out general objectives that are eventually supplemented by more precise and enforceable protocols. According to Young, international treaties may incorporate particular regulatory mechanisms to operationalize objectives, such as processes to identify at-risk species or levels for sustainable yields, even without agreement on precise obligations. This kind of objective may bring attention to situations that might otherwise go unnoticed.

Goals that organisations and agencies are instantly linked to make up the third category. In this area, principled unanimity is often widespread and profound enough that governments establish the institutional frameworks for its rapid pursuit. In addition to the Bretton Woods institutions, other examples include the UN Environment Programme, established following the 1972 UN Conference on the Human Environment, the Commission on Sustainable Development, established to implement Agenda 21 adopted at the 1992 UN Conference on Environment and Development, and the more recent High-level Political Forum on Sustainable Development, which will now implement the Sustainable Development Goals. Yet in the latter instance, the High-Level Political Conference on Sustainable Development was established before broad agreement on the Sustainable Development Goals had developed. These sorts of objectives often remain as vaguely stated overall goals rather than numerical targets, and institutional structures differ greatly in their ability to follow up on or institutionalise them. Since the High-level Political Forum is not explicitly an implementing body and currently lacks authority and resources to directly support the goals, which will instead require buy-in, political action, and resource mobilisation by a large number of other actors and intermediary institutions at various levels, the Sustainable Development Goals express some characteristics of each variety but lean towards the first two. According to the third form of goal setting, a proposal for a sustainability Grundnorm may provide a chance to establish normative agreement, and the 2030 Agenda for Sustainable Development may be strategically used to do so.

Putting the Sustainable Development Goals in Context

The Sustainable Development Goals, which replaced the earlier Millennium Development Goals, were created in an overtly political context, but they must also be viewed as the most recent step

in a nearly 30-year evolution of global governance that started with the popularisation of the sustainable development concept. We will now examine that philosophical and historical framework in this section.

Aiming for Sustainable Development as a Normative Objective

The progressive shift away from conventional governance methods of norm promotion and rule making and towards goal setting, among other cutting-edge governance mechanisms, is a particularly significant aspect of this development. While there are many other causes for this change, the overall trend in global governance is widely known. When it comes to sustainability issues, the shift towards innovative, multi-stakeholder, and goal-setting forms of global governance is particularly obvious, as governments and stakeholders increasingly look for alternative solutions in light of the perceived limitations, difficulties, and shortcomings of conventional global rule-making.

A considerably higher understanding of the interconnection of environmental, social, and economic systems has emerged over time from what initially began out as independent environmental and development goals. The first widely accepted definition of sustainable development, given by the World Commission on Environment and Development in 1987, was "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". This definition has served as a benchmark for the idea for many years, despite the fact that it is still difficult to quantify given the vagueness of its application to concrete policy. However, the idea was successful in adding the time dimension to development by taking into account intergenerational equity rather than concentrating only on human well-being in a single generation. It also succeeded in highlighting the importance of considering the economic, social, and environmental dimensions of sustainable development as interdependent. Further political urgency for action on sustainable development challenges was generated by the 1992 UN Conference on Environment and Development in Rio de Janeiro. Nonetheless, it resulted in a specific understanding of sustainable development that was appropriate for the current political and economic environment. Within a general liberal economic system, it concentrated emphasis almost solely on the concept's environmental and development components. This perspective emphasised economic growth and saw market norms and processes as the most effective means of addressing environmental protection and development issues at the same time. In practise, states ratified the Rio Declaration, a declaration of principles to guide action on environment and development, and Agenda 21, a comprehensive action plan on a variety of sustainable development concerns, as well as two significant global treaties on climate change and biodiversity. In particular, Agenda 21 pledges made in Rio de Janeiro are being followed up on by the Commission on Sustainable Development. Ten years later, in Johannesburg, the 2002 World Summit on Sustainable Development evaluated the status of Agenda 21 implementation and called for more steps in the Johannesburg Plan of Implementation, but no new treaties were established. As an alternative, it encouraged multifaceted public-private partnerships, sometimes known as "type II outcomes," as the main strategy for execution. Evaluations indicate that these collaborations have, at best, had mixed results. Many suffered from a lack of precise quantitative objectives and formalised monitoring, review, or evaluation mechanisms; significant underrepresentation of marginalised groups like women, indigenous peoples, youth and children, and farmers; and a dearth of partnerships actually geared towards carrying out intergovernmental commitments. The idea of sustainable

development pushed inside the United Nations progressively shifted to more self-consciously encompass three "pillars": environmental, economic, and social, around the time of the 2002 World Summit on Sustainable Development.

Similar to the 2010 UN Conference on Sustainable Development, there were no rule negotiations at the 2012 UN Conference on Sustainable Development, but it did broaden its focus from partnerships to include a variety of innovative governance and implementation mechanisms that included participation and commitments from the government, stakeholders, foundations, and corporations. Moreover, it highlighted the need of combining the three elements and brought the social aspect of sustainable development into sharper emphasis than past summits. By doing so, it was recognised that the governance framework around the expansive sustainable development goal was becoming more complicated and fragmented, with the United Nations serving as only one of several focal points. As a result, the 2012 UN Conference on Sustainable Development recognised that the primary means of implementation consisted of approximately 730 voluntary commitments made during the summit and more than 700 additional commitments made by governments, international organisations, partnerships, action networks, and nonstate actors.

Precursor: The Millennium Development Goals

The Millennium Development Goals, which are seen as a precursor to the present Sustainable Development Goals, were also broadly adopted by nations around the time of the 2002 Johannesburg Conference. The Millennium Development Goals are the end product of a process that began in the 1990s with the initial goal of improving the efficacy of development aid. At that time, the UN and the Organization for Economic Cooperation and Development held a number of conferences to discuss international development goals. Some of these goals were eventually consolidated into the list of eight Millennium Development Goals, with initially 18 targets and 48 indicators, which were published in September 2001 as an annex to a "road map" created by the UN Secretary-General. Millennium Development Goals was to direct national and international policy in the years leading up to 2015. Based on the efforts of an interagency and expert groups, the list was finally enlarged in 2005 to include 21 goals and 60 indicators.

Compared to the new Sustainable Development Goals, the Millennium Development Goals were substantially more constrained. They only addressed a portion of the sustainable development goals, which include eradicating extreme poverty and hunger, achieving universal primary education, promoting gender equality and women's empowerment, decreasing child mortality, improving maternal health, combating HIV/AIDS, malaria, and other diseases, protecting the environment, and all of this by forging an international development partnership. The seventh objective was the only one to address issues related to the environment and planetary stability, which are now much more fundamental to the Sustainable Development Goals. This objective was outlined in four priorities that included improving the lives of slum inhabitants, decreasing biodiversity loss, increasing access to clean drinking water, and improving access to sanitation.

The Millennium Development Goals, in contrast to the current Sustainable Development Goals, primarily focused on poor countries, with wealthier nations participating mostly as financiers of international and national development organisations. The UN Secretariat produced the Millennium Development Goals in the framework of the Millennium Summit rather than the UN General Assembly, despite the fact that it drew on prior international conferences, discussions within and outside the UN system, and contributions from nations.

The experience with the Millennium Development Goals may teach both good and bad lessons. On the plus side, the Millennium Development Goals were effective in gaining support for, drawing attention to, and communicating complex global concerns in a clear and intelligible manner. The Millennium Development Goals have led to considerable reductions in severe poverty, gender inequality in general, and gender imbalance in primary education. A decrease in malaria-related illnesses, increased access to clean water, and the mobilisation of financial resources in line with Millennium Development Goal 8, or "the global partnership for development," were all improvements.

The Millennium Development Goals have still drawn a lot of criticism. Several of these criticisms are evaluated in this book. Gaps in target and regional accomplishment levels are among the critiques. Moreover, they failed to explain how national or local goals and priorities relate to global objectives. The UN Secretariat's deliberate decision to establish the Millennium Development Goals at the global level, which had the effect of concentrating emphasis on aggregate measures of success, is one of the reasons for this. These overall statistics did not always assist focus attention or allocate resources on regional or local needs and desires. Ironically, the capacity to compare the accomplishment of the Millennium Development Goals to monetary standards may have prevented the Sustainable Development Goals from doing the same. In fact, by repeatedly highlighting the significance of country ownership, disaggregated data and measurement, consideration of various national and local capabilities and circumstances, and encouragement to formulate targets at the national level as well as leaving opportunities to create supplemental indicators at the national level, the Sustainable Development Goals reflect repeated concerns raised in negotiations around a "one-size-fits-all" approach.

The Millennium Development Goals' lack of inclusivity is the subject of another set of accusations. The Millennium Declaration's three key themes of "development and poverty eradication," "preserving our shared environment," and "supporting the unique needs of Africa" were primarily the focus of their attention. Some concerns have to be omitted in order to make them into a clear, succinct, and easy-to-remember list of objectives. The Millennium Development Goals had "unintended effects" in that they called attention away from other crucial problems and goals, as Fukuda-Parr notes. Some criticisms focus on the characteristics of the targeted. As the Millennium Development Goals were created with the notion of results-based management in mind, topics like human rights, equality, and good governance, where it might be difficult or contentious to gauge progress, were left out. Purported causal relationships between the Millennium Development Goals and measures of progress, even in the case of included objectives, turned out to be dubious. For instance, some contend that the economic boom in developing nations during the time period covered by the Millennium Development Goals, particularly in China, is to blame for a great deal of apparent accomplishments, especially in terms of economic and poverty objectives.

CHAPTER 5

ECONOMIC, SOCIAL, AND ENVIRONMENTAL POLICIES

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The Millennium Development Goals are not the beginning point of our conceptual explorations in this book, despite the fact that they apparently replace the Millennium Development Goals and clearly integrate and continue the pursuit of its primary goal of eradicating poverty. In our opinion, the Sustainable Development Goals represent a fundamentally new approach to global issues that acknowledges the interconnection of socio-ecological systems and human communities. The Sustainable Development Goals support integrative and systemic approaches to global concerns in order to capture the links between various problems.

This distinction is crucial. Growing evidence indicates that the earth system has reached the Anthropocene, a new period in which people now largely influence planetary processes. Human systems cannot be meaningfully separated from the natural systems on which they depend for essential resources since humanity has evolved into a systematic impact on them. The prospect of creating and institutionalising a Grundnorm of sustainability to support the Sustainable Development Goals in light of this historical change and systemic upheaval. It would be based on the idea that all people have the right to better well-being and that planetary limits should be respected.

The Sustainable Development Goals also represent a political decision. The concept of sustainable development itself, as previously mentioned and noted by a number of other chapters, exhibits creative ambiguity, while the effort to integrate environmental, economic, and social goals reflects more than 20 years of international negotiations and compromises since the 1992 Rio Summit. The Sustainable Development Goals explicitly state that they "integrate," "balance," and "secure interlinkages" among economic, social, and environmental purposes. This raises doubts about whether a coherent agenda will be produced, as including both modifiers in practise avoids contentious political debates about fundamental premises. For instance, Goal 8 of the Sustainable Development Goals calls for "sustained" and "sustain- able" economic development and employment but omits any reference to planetary limitations, as noted by Bernstein in this volume's. Attempts had been made at the same time to incorporate the idea into discussions regarding the "growth" goal, and the respective Sustainable Development Goals mention the significance of securing natural resources or integrating various aspects of sustainable development into policy. For instance, Goal 12.2 reads, "By 2030, achieve the sustainable management and efficient use of natural resources," while Goal 17.14, referring to implementation methods, specifies that such methods should "improve policy coherence for sustainable development.

The difficulty of systemically operationalizing integrative action across the objectives is highlighted in almost every chapter. These difficulties range from creating integrated and system-oriented assessments and measures suitable for monitoring and evaluating progress on

goal attainmentto the differentiated difficulties and opportunities of integrated approaches to problems where there is little causal and normative consensus, such as education. These difficulties also include integrating cross-cutting concerns, such as better governance, into implementing arrangements at multiple levels. The argument made by Andresen and Iguchi that the Millennium Development Goals have not been fully achieved is likewise based on a lack of "fit" or mismatch between institutional solutions and the structure of issues, with the environment serving as a particularly poor example. Despite the fact that Millennium Development Goal 7 acknowledged environmental problems, the Millennium Development Goals as a whole primarily addressed the environment in isolation and failed to acknowledge the connections between social, economic, and environmental concerns. Fish supplies have continued to fall, deforestation has persisted at an alarming pace, and worldwide emissions of greenhouse gases have continued to climb, with the exception of modest progress made towards sanitation objectives. In the scientific literature, the significance of an integrated approach has also been underlined. A shift in knowledge of global issues since the time of the Millennium Development Goals is also highlighted by the growing realisation of how systems are linked and the necessity for integrative approaches. In conclusion, the Sustainable Development Goals emerged in the context of growing recognition that progress to date has been insufficient, that interdependencies and complexity on a global scale have increased, and that the scale of response required to address these complex challenges will require radical adjustments to human behaviour and governance structures. The success of the Millennium Development Goals offered a constructive model for breaking the impasse in the implementation of sustainable development policies, and the Sustainable Development Goals got broad support from a variety of stakeholders in addition to governments in the North and South. By concentrating on the Sustainable Development Goals, multilateral discussions in several venues were spared from having to resolve a variety of disagreements that precluded binding pledges and advancement on a range of topics, from trade to climate change. After 40 years of work, there may now be unique opportunities to substantively combine environment and development by integrating sustainable development within the framework of the Millennium Development Goals and the mainstream development agenda. In fact, the new Sustainable Development Goals and their important position in the post-2015 development agenda may signal a change in how international development is seen, at least within the confines of the UN, as a component of a larger, global sustainability agenda.

The Sustainable Development Goals are being negotiated

So let's take a quick look back at the discussions that eventually resulted in the establishment of the Sustainable Development Goals. The first proposal to create Sustainable Development Goals was made by the Colombian government, with support from Guatemala and the United Arab Emirates, during the High-Level Dialogue on the Institutional Framework for Sustainable Development, which took place from July 19–21, 2011, in Solo, Indonesia, in preparation for the 2012 UN Conference on Sustainable Development. An international consultation with representatives from 30 nations was undertaken in Bogota, Colombia, in November 2011 as a result of the proposal receiving great attention at several forums throughout the planning phase. They viewed the UN Conference on Sustainable Development in 2012 as a crucial chance to reach an agreement on a political commitment to sustainable development and the need for a practical strategy to serve as the foundation for commitments to ensure the implementation of the

1992 "Agenda 21" and the 2002 Johannesburg Plan of Implementation. They stressed the significance of the goal-oriented framework as a tool to make it simpler for institutions and the government to collaborate in order to achieve shared goals. Seven months later, the Sustainable Development Goals had become a cornerstone of the final conclusion paper of the 2012 UN Conference on Sustainable Development, "The Future We Want." Seven paragraphs had been dedicated to the Sustainable Development Goals, and in the eyes of many, the agreement on a process to develop universal Sustainable Development Goals was "one of the most important political decision of the Conference, given its centrality in helping to define the post-2015 development agenda".

The outcome document mandated the Sustainable Development Goals to be: action-oriented; concise and easy to communicate; limited in number; aspirational; global in nature; and universally applicable to all countries, while taking into account different national realities, capacities, and levels of development and respecting national policies and priorities. "The Future We Want" also said that the process to build them should be "coordinated" and "coherent with" the process to define the post-2015 development agenda.

The process of defining the Sustainable Development Goals garnered the greatest attention of negotiators in reaching the agreement at the 2012 UN Conference on Sustainable Development. Originally, governments were split on a number of topics. The Euro- pean Union, for one, championed a science-based method. Several poor nations, however, being typically underrepresented in global scientific assess- ment procedures, sought to incorporate government specialists. In the end, states agreed on the compromise to create "an inclusive and transparent intergovernmental process on the Sustainable Development Goals that was open to all stakeholders with a view to producing global sustainable development objectives to be accepted by the UN General Assembly." An Open Working Group was created with 30 delegates, nominated by nations via the five UN regional groupings with the objective of ensuring "fair, equitable, and balanced geographic representation." The Open Working Group was supposed to be created before the sixty-seventh session of the UN General Assembly in 2012, however inter- governmental talks on the selection of the 30 delegates and on procedures of the inaugural Open Working Group meeting took longer than planned. Ultimately, on January 22, 2013, the UN General Assembly voted on membership of the Open Working Group in its resolution 67/555. Six seats were to be held by single nations. Nine seats were to be shared by two nations of comparable areas. Fourteen seats would be shared by trios of countries. The final seat would be shared by four nations. In reality, only a few groups coordinated their viewpoints among those sharing a seat while making interventions, and many coun- tries spoke on their own behalf. This made the debates in practise a more genuinely "open" working group, with around 70 nations, reflecting the wide desire in being actively involved in the design of the Sustain- able Development Goals as opposed to leaving it to the 30 officially chosen members. Additionally, the structure helped reduce typical North-South clashes, at least until the very last stage of the nego- tiation, by loosening the very tight coalitions that are commonly seen in UN talks and by offering opportunity for individual nations to speak on their own behalf. The inaugural session of the Open Working Group took place in March 2013 at the UN headquarters in New York, and elected as co-chairs Macharia Kamau of Kenya and Csaba Kőrösi of Hungary. The first eight sessions were dedicated to discussing thoughts and ideas on a range of subject problems, with invited scientists and professionals contributing input. The somewhat long stock- taking process

allowed negotiators several chances for learning, which enabled the Sustainable Development Goals to rely on notions that went beyond standard diplomatic terminology. On February 21, 2014, the co- chairmen produced a paper with 19 "focus areas," summarising the stock- taking conversation and setting the framework for the upcoming five-month negotiating process.

During these conversations, the overall number of goals changed between 16 and 19. Delegates sought on several times to minimise the number of objectives, following their mandate to make them "concise and restricted in number." Additionally, a number of UN-sponsored investigations have advised shorter lists. For example, the High-level Panel of Eminent Persons on the Post-2015 Development Agenda, established by UN Secretary-General Ban Ki-moon, suggested 12 goals, and a report in June 2013 from the SustainableDevelopment Solu- tions Network—another initiative of the UN Secretary-General—suggested 10 goals. In the end, the Open Working Group decided to propose 17 objectives with 169 targets for consideration by the UN General Assembly. This outcome also reflected UN Secretary-General Ban Ki-moon's synthesis report, "The Road to Dignity by 2030: Ending Poverty, Transforming All Lives and Protecting the Planet", an important input into the negotiations that helped frame the scope of the eventual 2030 Agenda for Sustainable Development.. Significantly, it characterised the outcome of the Open Working Group as "the essential underpinning for the post-2015 intergovernmental process." In part because of the inclusive process used to develop the Sustainable Development Goals, and in part because the draught agreement preceded the intensive phase of negotiations on the wider post-2015 agenda, the Sustainable Development Goals have mostly remained intact and at the centre of the 2030 Agenda for Sustainable Development, the outcome of the entire process.. Indeed, despite some misgivings about "sustainable development" in the title, which some developing countries saw as a debatable shift in language from the originally framed post-2015 "development agenda," in the end both the universal focus and the more encompassing concept of sustainable development prevailed. It may be fair to say that because major "post- MDGs" processes ended in 2013 and the Open Working Group was the only major intergovernmental process to discuss the agenda after that, the post-2015 development agenda had come to be discussed in the framework of the Sustainable Development Goals in the course of 2013–2014. This timing also helped elevate "sustainable development" to the mainstream international "development" agenda.

The background for this volume's questions is the history and current state of the Sustainable Development Goals. Never before has the global governance agenda been created with such a comprehensive and in-depth set of objectives. These objectives also possess characteristics that make them highly rewarding and difficult study topics. The Sustainable Development Goals are both less focused on secondary rule making at the moment of delivery and more detailed than prior initiatives. They often come in the form of broad objectives, measurable objectives, observable indicators, and tracking systems. Yet, failing to accomplish an objective has no immediate repercussions for those who are targeted. Instead, the objectives seek to engage other players and sectors in addition to the main aims. In order to influence actors to alter their behaviour, they do not establish particular duties, obligations, or accompanying compliance processes; instead, they provide benchmarks for improvement. Also, the Sustainable Development Goals deviate from the traditional pattern of aspirational objectives that ultimately gave rise to concrete norms or regulations. Instead, the Sustainable Development Goals' targets either reiterate already-existing rules, with separate institutional homes and mechanisms, or they

reflect longer-term objectives like the eradication of poverty, which continue to be expressed in aspirational terms without any explicit language to suggest that rule making should come as a means to achieving the targets. They do not, however, rule out the possibility of future rulemaking, for instance, in fields where there are no international conventions. The Sustainable Development Goals are not inherently less successful since there is often no expectation that rules will be made in accordance with them. It becomes much more crucial to pinpoint the precise processes and circumstances that will enable objectives to provide the intended outputs and results. We return to the three driving questions for the book because they are issues of governance. The first issue, which concerns what goals are, whether defining objectives is a good strategy for global governance, and how goals-based global governance differs from other techniques like rule-making or norm promotion, is thoroughly addressed in Part I of this book. Youngintroduces the topic by pointing out a few distinctions between goal-setting and rule-making as governance tactics, but he also makes suggestions for how the two may complement one another. Young's chapter ends with some recommendations for improving the effectiveness of the Sustainable Development Goals in light of the drawbacks of international goal-setting, particularly when there is a lack of a strong connection to regulations, as well as how creating such connections might increase the likelihood that the Sustainable Development Goals will be achieved.

After a thorough examination of the significance of differences with the previous Millennium Development Goals, Young and colleaguesturn the attention to the underlying circumstances in the twenty-first century that define the purpose of the Sustainable Development Goals. The chapter introduces the concept of a sustainable Grundnorm and challenges us to seriously consider the meaning and normative implications of a sustainability framing in the Sustainable Development Goals while simultaneously acknowledging that this is in conflict with the politics that produced the Sustainable Development Goals. This is perhaps the chapter's most contentious point. Although it is acknowledged that governance is essential to achieving the Sustainable Development Goals, how to include governance as a goal in and of itself, as well as an enabler for goal implementation at both the global and subglobal levels, continues to be a major implementation and follow-up challenge. The argument made that progress towards the Sustainable Development Goals necessitates attention to both "equitable" and "effective" governance as well as the traditional UN focus on "good" governance highlights the significance of recognising a multifaceted view of governance on both counts. However, the larger 2030 Agenda for Sustainable Development and other UN pronouncements also share similar broader governance problems. The chapter examines the politics of each of these categories, the extent to which the Sustainable Development Goals contain them, and the significance of their inclusion in governance institutions at various levels for fostering the circumstances necessary for the success of the objectives. Every governance system that consists of goals and objectives is fundamentally supported by measurement, which is covered in this book. There, Pintér, Kok, and Almassy make the case that the technical approach to monitoring and reporting on indicators that characterised earlier efforts, including the Millennium Development Goals, must be fundamentally rethought in order to adequately address the measurement challenges of the integrated sustainability problems that the Sustainable Development Goals claim to embody. So, they suggest a reform agenda that specifically takes into account how the creation of metrics, the use of indicators, and the interpretation of data interact with the politics of change or transformation that serve as the foundation for the Sustainable Development Goals.

The focus of the book's second section then shifts by looking at the lessons discovered from earlier efforts to use goals as a form of governance, specifically the Millennium Development Goals. These chapters concentrate on past initiatives in areas that the Sustainable Development Goals now recognise as sustainability issues, particularly in light of our second framing question and the likelihood that the new goals will succeed in achieving their more onerous agenda more than just providing a summary of how the Millennium Development Goals are faring. The ultimate purpose of this book is to increase understanding of the possibility of enhanced goal-setting for global issue solutions with a view to wider social and governance reforms. Do the Sustainable Development Goals provide a similar promise of hope from the viewpoint of a malnourished rural farmer in Mali, an unemployed inner-city machinist in Detroit, a struggling Chinese labourer, a resident of Tuvalu who worries about whether her home on the island will still be habitable when her children are grown, or a Pakistani villager with limited access to potable water? Strong state-level commitments are initially improbable in the absence of global sanctioning mechanisms, sizable financial transfers, or other substantial kinds of directed resource mobilisation. The Sustainable Development Goals, however, could be a crucial first step towards the long-term creation of more broadly accepted sustainability standards that nations, actors, and institutional processes can all rally behind and support. This book aims to make clear the processes involved in goal-setting, their ramifications, and the likelihood of going from goal-setting to meaningful action.

It was timely for a goal-oriented approach to sustainability challenges to develop. The Sustainable Development Goals could be used to increase ambition and close the gap between current political pragmatism and what many scientists believe is required to ensure a safe operating environment for the earth's life-support systems, based on the success of the Millennium Development Goals. Even though it is debatable whether or not the Millennium Development Goals were successful in bringing together a variety of actors and resources and achieving some of their objectives, their experience also serves as a cautionary tale because it is challenging to identify any specific rule making or institutionalised implementation mechanisms that followed from the MDGs. Goal-oriented methods might potentially have unforeseen consequences. Goals may affect priorities by "replacing attention from other objectives, upsetting current projects and alliances, generating perverse incentives, and undercutting alternative policy analyses" because they attract support and attention. All of the chapters in this volume seek to illuminate these opportunities and strategies for anticipating and reducing the risks by focusing on both the specific procedures and governance arrangements surrounding the Sustainable Development Goals as well as more general questions about goal setting as a governance strategy. So, in addition to providing a thorough examination of governance of and for the Sustainable Development Goals, the research and conclusions in these chapters also provide the first academic critique of this unique and more prevalent method of global governance via objectives.

Conceptualization of Goal-Setting as an Earth System Governance Strategy

In many social contexts, including international society, where there is no overarching government to assume responsibility and where we are faced with the enormous challenges of integrating the biophysical, economic, and social forces affecting the achievement of sustainable development on a global scale, the challenge of meeting governance needs has emerged as a central concern. When examining solutions to this problem, we often start by addressing

regulatory arrangements, stressing the creation of rules and concentrating on concerns pertaining to their application and processes that are effective in obtaining compliance from individuals who are subject to the laws. But, if we consider governance in general terms as a social function focusing on guiding people or groups towards desired outcomes, we might view goal-setting and attempts to reach milestones connected to important objectives as a unique approach to addressing governance demands. I investigate the nature of goal setting as a governance strategy, examine the circumstances in which it can function effectively as a steering mechanism, think about how to increase the effectiveness of goal setting in various contexts, and make a comment on the applicability of this line of thinking to the United Nations' initiative to create a set of Sustainable Development Goals. In contrast to normative or prescriptive arguments, mine is empirical in nature. I make no attempt to evaluate the relative advantages of goal setting and rule creation as separate governance procedures. Instead, I want to make clear the importance of goal setting as a strategy to address the governance demands that rule making has gotten far less attention for among people who think about governance at the international or global level. I don't intend to actively support people trying to achieve the Sustainable Development Goals, and I don't try to come up with any concrete suggestions. However, what I have to say might be helpful to those trying to maximise the effectiveness of the Sustainable Development Goals by assisting them in avoiding some common mistakes made when using goal setting as a strategy for governance and in coming to a conclusion about how to interpret the goals in a way that is both realistic in political terms and appropriately aspirational in normative terms. I go forward as follows. The core characteristics of goal setting as a governance method are explored in the first substantive part, which also distinguishes it from the more well-known concept of rulemaking. The second part makes remarks on the situations in which it could be wise to combine decision-making and goal-setting to create integrated governance systems. The third part then lists the difficulties encountered when attempting to successfully implement goal setting in contexts like the global society. In the fourth part, I focus on the subject of efficacy and make some broad observations about what factors affect goal setting's success or effectiveness as a governance method. The fifth part examines methods or systems that might be useful for people looking to improve goal-efficacysettings. The consequences of this line of thinking for the formulation and implementation of the Sustainable Development Goals themselves are briefly discussed in the concluding section.

Goal-setting aims to direct behaviour by I establishing priorities to be used in allocating attention and limited resources among competing objectives, motivating those tasked with working towards the goals, identifying targets and providing yardsticks or benchmarks to be used in tracking progress towards achieving goals, and combating the propensity for momentary desires and impulses to divert the attention or resources of those tasked with working towards the goals. Goal setting therefore contrasts from rule making, which aims to direct the conduct of important players via the articulation of rules and the development of compliance mechanisms whose objective it is to persuade actors to alter their behaviour appropriately.

Think of the capital campaigns that colleges, hospitals, libraries, public radio stations, and different charity organisations periodically run as a source of instructive examples to help make these sometimes abstract concepts tangible. The typical process is to establish a specific, monetary objective, designate a target date for achieving the goal, put out some ideas for how the money to be mobilised will be used, strongly advertise the campaign, and develop a highly

visible method for monitoring progress. The goal is to recruit new supporters while also identifying and activating existing ones. Such campaigns not only help regular staff employees concentrate their efforts and attract passionate volunteers, but they also help the relevant organisations mobilise resources and put them on routes that are likely to determine their programmatic growth for years to come. Capital campaigns' success is by no means guaranteed. There are highly compensated professionals whose job it is to advise businesses on when to start a capital campaign and how to choose a suitable objective. Yet strategically prepared and timed campaigns often succeed in achieving their objectives. Some even surpass their targets, which enables leaders to make convincing claims about their fundraising abilities.

This example is helpful in highlighting the distinctive qualities of goal setting as a steering mechanism. We may find some rather clear instances of the use of this governance method at the national and international levels by starting with this understanding of goal-setting. At the national level, notable examples include the refocusing of the US economy between 1942 and 1943 to achieve the goal of making the US a "arsenal of democracy" in the struggle against the Axis powers, and, perhaps even more obviously, the work of the US Apollo Project, which was started by the Kennedy Administration and intended to land a person on the moon by the end of the 1960s. The creation and execution of the Millennium Development Goals, which were first adopted by the UN General Assembly in 2000, is unquestionably the most notable recent example of goal formulation at the worldwide level. Although while goal-setting specifics vary widely depending on the circumstance, all attempts to employ goal-setting as a governance method have three things in common. In order to develop objectives, one must first be able to create clearly defined priorities and express them as specific goals. The whole purpose of goal setting is to prioritise a small number of issues in the distribution of limited resources, such as staff time and political capital. The pursuit of objectives often moves forward in campaign mode after they have been defined. The key concept is to focus attention and gather resources to launch a sustained effort to produce quantifiable outcomes within a certain time period. A conspicuous yet illustrative example is the Apollo Project's aim to land a human on the moon within ten years. Setting goals also necessitates making an effort to develop precise measures to monitor development over time. An excellent example is Millennium Development Goal 1, which aims to reduce the number of people who live on less than $1 per day by half by 2015. But, in the real world, gathering the necessary data to operationalize this kind of measure may be challenging. The use of monitoring methods allows for the measurement of goal attainment progress as well as the encouragement of all parties concerned to increase their efforts in order to meet the goal by the set deadline.

As a result, the fundamental assumption behind goal setting as a governance method is distinct from the assumption underlying rule making. While goal-setting involves the expression of aspirations and focuses on methods for igniting support among supporters and maximising the dedication required to sustain the effort required to reach more or less well-defined targets, rule-making involves the formulation of behavioural prescriptionsand pays attention to issues of compliance and enforcement. Additionally, rule making involves the formulation of behavioural prescriptions that are anticipated to stay in place eternally, unlike goal setting, which often involves waging a campaign to achieve objectives within a certain time period.

CHAPTER 6

CONNECTING REGULATION MAKING AND GOAL SETTING

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Both goal-setting and rule-making may, and often do, function independently as separate approaches to meeting governance concerns. Consider, for illustration's sake, the difference between the rule-making methods represented in many regimes intended to achieve sustainable outcomes in the harvesting of living or renewable resources and the goal-setting technique reflected in the earlier Millennium Development Goals. The Millennium Development Goals require parties to launch an effort to address issues like eliminating extreme poverty and hunger, lowering infant mortality, and battling illnesses like HIV/AIDS, malaria, and other ones by the end of 2015. By contrast, regulations controlling the use of renewable resources often depend on laws covering things like quotas, open and closed seasons, limits on the sorts of gear that may be used, the handling of by-catches, and so forth. There is often minimal overlap between the two kinds of governance systems' procedures.

Yet, the two approaches are not antagonistic to one another. They could work well together in certain circumstances. Goal-setting and rule-making may become components of integrated governance systems, which is increasingly relevant. Take as examples the overall objective of the climate regime stated in the UN Framework Convention on Climate Change as avoiding "dangerous anthropogenic interference with the climate system" and the target of achieving maximum or even optimum sustainable yield embedded in fisheries or marine mammal regimes. The 1946 International Convention on the Control of Whaling serves as an example. In these situations, regulatory systems are used to direct behaviour towards the accomplishment of defined objectives. These kinds of circumstances are typical and need systematic consideration in any thorough assessment of governance techniques. The main emphasis of this chapter, however, is on goal creation as a unique governance method in contexts where free-standing objectives, like the Millennium Development Goals and the Sustainable Development Goals, are present.

Typical Mistakes Made in International Goal Setting

Intuitively, making goals is attractive because we have all done it in our own lives and because the majority of us believe that pursuing personal objectives has played or may play a significant role in directing and guiding our efforts, or, in other words, as a type of self-governance. Yet, can we extrapolate from our individual experiences using goal-setting as a method of attaining self-government to the use of goal-setting as a method of achieving collective governance at the level of global society. In answering this question, a number of distinctions between self-government and collective government are brought to light that are likely to cause issues with the application of goal-setting in global society. Consider the following situations as examples of this claim.

Making the objectives. Even under the best of circumstances, prioritising is challenging. While trying to set personal priorities, people often struggle inside. However, when goal setting is a group effort involving some form of negotiation or consensus-building among a sizable number of self-interested actors, such as states in international society, there is a risk that I the group will end up with too many goals to be useful in setting priorities and allocating resources; the goals chosen will be framed in general terms that are difficult to operationalize, much less to monitor; or individual actors will make decisions that are not in the

Monitoring development. When the objective of a fund-raising effort is expressed in monetary terms, it is simple to monitor progress. Common benchmarks used in this context include gadgets like a "barometer" that displays the percentage of the amount raised at any particular moment. Yet a lot of global objectives are couched in words that are difficult to quantify, which leads to the employment of subpar or even deceptive methods. There is a risk of overemphasising easily measurable criteria when tracking progress towards improving human welfare, underemphasizing important but difficult-to-measure values, or coming to a point where there is a lot of uncertainty or disagreement about how to best track progress.

Mechanisms of behaviour. When the going gets rough owing to conflicting demands or resource shortages during times of economic or social hardship, the incentives and pressures to remain with objectives may not be sufficient to guide behaviour at the international level. The strategies that are most likely to succeed in achieving objectives may be quite different from those that are successful in encouraging adherence to laws and regulations. In order to achieve goals, for instance, it is often necessary to form a group of people who are committed to moving forward, yet obtaining compliance from specific individuals is crucial for rulemaking to be successful. Goal-setting as a governance technique may be more or less successful depending on whether it is used as a stand-alone tool, a complement to a rule-based system, or a method of establishing objectives stated in a rule-based system.

Benefits and costs of opportunities. The design and implementation of rule-based regimes on topics like climate change or the loss of biological variety may be accomplished by focusing on goal setting, which can distract attention and divert resources from attempts to do so. When resources are few, it may be crucial to consider the possibilities for formulating goals and establishing rules. Yet, there could also be chances to generate synergy by combining various technologies or applying them sequentially.

Complacency. Generalizing, goal setting may lead to a feeling of complacency based on the idea that once admirable objectives are defined, there is no need to devote time and effort to more difficult types of problem solving. As a result, there is a risk that individuals who are unable or unwilling to address governance issues via regulatory measures would use goal setting as a distraction to divert attention away from their inability to take governance concerns seriously.

Determinants of Goal-Setting Success

The difficulty of determining the efficacy of goal setting is quite similar to the difficulty of creating rules. To begin with, the well-known difference between outputs, outcomes, and effects holds true for both the efficacy of legislation and the assessment of goal-setting success. Goal-related outputs include the formulation of objectives and indicators linked to particular goals as well as the creation of organisational structures to manage goal-achievement efforts. Results relate to behavioural changes made by governments and nonstarter actors to promote movement

towards goal completion. Effects thus include progress towards achieving the objectives themselves. As with regulation, when we go from outputs to affects, the causal chain lengthens, gets more convoluted, and becomes more difficult to identify. The development of organisational structures intended to encourage the achievement of objectives and the formulation of goals may be linked causally quite simply. Demonstrating this link between goal-setting and actual achievement of the relevant objectives is another story. As an example, consider the Millennium Development Goal that focuses on ending poverty. As some observers have noted, following the passage of the, there has been discernible progress towards eliminating severe poverty. But can we demonstrate a clear causal link between the acceptance and use of a minimum, this is a complicated causal situation. The Millennium Development Goals may have contributed to the decline in severe poverty, but other other aspects of economic development, social transformation, and public policy in developing nations like China also played a part..

Therefore, there is no reason to assume that goal setting will always be equally effective in addressing governance demands. When used as a steering mechanism in a group of fiercely autonomous individuals who prioritise their own attempts to succeed under most circumstances, what may work in a close-knit community with members who are committed to the benefit of the whole may fail? This emphasises the need of starting an investigation into what factors influence success when using goal setting as a governance technique. Here, I outline some early findings regarding four crucial sets of circumstances pertaining to I the problem's nature, the players' personalities, the setting's key characteristics, and the organisation of assistance in certain situations.

The nature of the issue. Not all issues that need governance are the same; some may lend themselves better to goal-setting techniques than others. In the case of lumpy communal commodities, for example, those attempting to provide governance must overcome challenges brought on by the fact that none of the good may be delivered until a specified threshold is met in addition to the well-known difficulty of the free-rider dilemma. Contrarily, if community goods are ongoing, early efforts allowing for beginning supply of the commodities may inspire group members to contribute more in order to receive more. The amount to which outsiders can or should contribute and the methods to be employed in channelling the contributions they do make are often complicated questions in situations where the problem is geographically defined. If a goal is achieved, an issue may be permanently solved in situations when it is a finite problem. On the other hand, goal setting may be less useful as a governance method if the issue is ongoing, since it may be hard to make precise evaluations of target accomplishment. Beyond this, there are variations in the size and extent of the issue. It is one thing to strive for the highest sustainable yield in a fishery that is spatially constrained and lightly fished by a small number of easily recognisable fishermen; it is quite another to achieve the same goal in a remote fishery that is heavily fished by numerous fishermen who engage in illegal, unregulated, and unreported activities. This debate provides an introduction to the subject of fit, which has been studied in relation to international collaboration. In other words, the degree to which the objectives chosen and the methods put in place to achieve them are compatible with the defining characteristics of the issue they attempt to address will determine the success in goal accomplishment.

The performers' personalities. Success is probably going to depend in part on how much the actors' conduct follows the logic of consequences as opposed to the logic of appropriateness. Success will need an appeal to actors based on estimates of benefits and costs where the logic of

consequences prevails. By contrast, linking goal-setting to norms and values may be successful when the logic of appropriateness takes hold. More broadly, goal setting may function effectively in settings where the aim can be incorporated into a cohesive social narrative, so that it becomes part of how players see their identity and organise their thoughts about government. It may be very simple to achieve objectives that include the provision of communal or public goods in situations where contributing to the common good is culturally mandated, for instance. At the international level, dealing with actors that are also collective entities presents an additional issue. This raises a number of issues related to the fact that upholding international goals may prove to be highly contentious in the domestic politics of individual states and that commitments to such goals may wax and wane over time as governments come and go at the domestic level. It also introduces the well-known problem of two-level games in thinking about the effectiveness of goal setting. When a new government becomes office, it has a particularly significant problem as it looks to set itself apart from the previous one and finds methods to free up funds to undertake fresh policy projects. These kinds of forces unquestionably contribute to governments' frequent inability to stick to their commitments to provide help to poorer nations or to achieve objectives like preserving biological variety or conserving the earth's climate system.

Aspects of the environment. Goal achievement is frequently influenced by aspects of the current social environment, such as the number of actors involved, the degree to which the actors are connected through shared interests or cultural affinities, the extent to which wealth eases the burden of contributing to the achievement of shared goals, and the possibility of technological innovations that are likely to prove beneficial in problem solving. Establishing objectives is not a good governance method in situations with many of players who would have to make significant sacrifices to achieve them, for example. Individual actors have a tendency to assume that their actions won't have much of an impact in these situations. On the other hand, technological advancements may solve issues that were serious before they were made. Under such circumstances, goal achievement may turn out to be considerably simpler than anticipated at the time of goal articulation. Beyond this, there are concerns about shared history, culture, and community in the pursuit of similar objectives. Setting goals may become a common approach to solve issues when there is trust built through a lengthy history of collaborating to address shared problems. By contrast, goal setting seldom works as a strategy for fulfilling the demands for governance in situations where long-standing animosities engender mistrust and cooperative attempts are likely to result in misunderstandings. The impact of ideology or prevailing social narratives is a topic that is especially pertinent in various contexts. There is a propensity to link goal-setting with centrally planned or socialist regimes, where the state is able to define objectives as well as implement effective measures to distribute resources or elements of production to meet objectives. On the other hand, rule-making is frequently linked to liberal systems, where the state can set the rules of the game but is otherwise expected to limit interference in the affairs of private actors and rely on regulations that apply to all when it is necessary to take action to further the public good. It's crucial to not overstate how significant this difference is. Think about how goal-setting helped the United States with the Apollo Project in the 1960s and the Manhattan Project during World War II, or how environmental restrictions helped China's centrally planned economy. Nonetheless, it is important to address the possibility that ideological factors will affect how important players respond to measurements involving goal setting.

A rallying of forces. Under certain circumstances, those who utilise goal-setting as a governance tactic may be more or less effective in mobilising and maintaining the support required to achieve their objectives. Building coalitions of the willing, emphasising the benefits of joining coalitions of supporters, and making a variety of prizes available to individuals who not only contribute to the achievement of objectives but also urge others to do the same are some of the strategies that may help with this. It is partly a question of championing or leading on the part of powerful people who can convey objectives in a compelling way and enthuse others working to achieve the objectives with a sense of purpose about the significance of their roles in the process. But, regardless of the situation, just stating objectives and expecting society's participants to put in a concentrated effort to achieve them is insufficient. Setting goals as a governance method requires a concerted effort to inspire supporters to work towards the shared goal, often over a considerable amount of time.

How to Improve the Success of Goal Setting

The main task is to persuade the relevant players to change their behaviour by improving their comprehension of the requirements for governance, fortifying the commitments they make to pursuing important objectives, and giving them strong incentives to follow through on those promises.

These initiatives may sometimes include incentives that may be justified by a utilitarian analysis of benefits and costs. Consider some of the recommendations made by analysts like Schelling on committal strategies in circumstances where there may be significant incentives to defect and therefore significant credibility issues. To make its commitment genuine to itself and believable to others, an actor can agree to bear charges in the case of breaking a promise, for example. Incentives have also been used in situations where some people find them more believable than others. Religious institutions, for instance, often urge the devout to fulfil rigorous obligations, promising them that doing so would entitle them to benefits in paradise. The effectiveness of this mechanism in influencing the conduct of believers cannot be disputed, even if it will not be appealing to individuals who do not believe in a hereafter. On the other side, there are instances when methods for improving goal setting depend on processes that are difficult to express in terms of benefit/cost calculations. This is particularly relevant in instances of collective-action issues when there are the well-known incentives to defect or take advantage of others. Thus, relying on procedures that entail elements like honour, moral responsibility, face-saving, a feeling of group unity, or even the force of habit, may make sense. In the anarchic environment of global society, when many conventional techniques for doing so are of little usefulness, what actions are most likely to boost the success of goal setting? Following are some remarks regarding a variety of techniques that could be useful in this situation.

Promote the objectives in a spectacular manner. A target like the Millennium Development Goal 1 of reducing "the percentage of people whose income is less than $1 a day" by 2015 lends itself to formulation as a sound bite that is simple to grasp and to portray as a challenge to everyone. It is also simple to create a visual barometer that enables everyone to track the advancement—or lack thereof—of such a goal over time and determine if milestones along the way are being reached. In contrast, the objective of preventing "dangerous anthropogenic interaction with the climate system" has an ambiguous aim and no clear measuring process. As recent events have

shown, it is even conceivable for certain actors to win support by contesting the idea that climate change is a result of human activity.

Put the objectives in a public statement or paper. Resolutions passed by the UN General Assembly are not legally enforceable, but they may gain prominence as important texts that raise awareness of objectives, give important goals a feeling of legitimacy, and highlight the degree to which various players are working to achieve them. One notable example is the UN General Assembly's Millennium Declaration, which established the Millennium Development Goals in 2000.. What about the 2015 resolution that formally adopted the list of SDGs?.

Make pledges official. Even if they are not legally enforceable, formalising promises may nonetheless be beneficial. Fundraisers are used to this system. Even though they are not required by law to follow through on their pledges, people who promise to donate US$100 a month to a deserving organisation are likely to develop the habit of doing so often. The idea that people who have already begun giving are more likely to make subsequent donations is a key one in fundraising. Consumers may even make their donations routine by approving automated withdrawals from their bank accounts or credit cards. Path dependency thus favours success since it will require a conscious effort to veer from the route leading to goal achievement under such circumstances.

Formalize your promises such that breaking them would result in loss of face or public humiliation. The theory behind this is that even when they are not legally obligated to keep their word, performers are inclined to avoid the humiliation of breaking promises. The commitments that nations were required to make in accordance with the conditions of the 2009 Copenhagen Accord on climate change serve as a notable illustration of this process. The fact that these commitments are primarily optional has drawn criticism for the Copenhagen Accord from many quarters. Nonetheless, it is intriguing to see how much leaders feel compelled to at least make an effort to keep their promises.

Start a social movement with the aim of achieving the objective. The aim of the campaign known as 350.org is clear to everyone, even if protecting the climate system from harmful human influence may be an ill-defined objective. It is simple to track progress towards or away from this objective. As significant, the target of reducing atmospheric carbon dioxide to 350 parts per million has evolved into the catchphrase for a social movement that is inspiring people to take action all around the globe. Whatever their benefits from the standpoint of rational choice, social movements can trigger significant social changes, particularly when their objectives are clear and their progress towards achieving those objectives is unmistakable.

Make the objectives enforceable. On the premise that legal duties have their own normative pull, giving aims legal force may boost the desire of actors to fulfil their promises or pledges. The concept behind this is that having some behaviours legally required may have an impact on behaviour even when there aren't any formal consequences or the penalties for disobedience aren't severe. One such example is the intention to prevent "dangerous anthropogenic interference with the climate system," which is stated in article 2 of the UN Framework Convention on Climate Change. Yet it's also crucial to keep in mind that larger cultural viewpoints, which are likely to change throughout time and location, have an impact on how people behave when they feel a feeling of legal responsibility.

Set up clear benchmarks to measure your success. A clear timeline for progress towards objectives and benchmarks to use in determining whether efforts to achieve goals are on track are often helpful additions to generating indicators for tracking progress. By breaking down the main objective into smaller, more achievable steps, these actions also help create checkpoints that make it easier to gauge progress and, if required, make course modifications midway through. Some actors will find it advantageous to establish clear benchmarks that may serve as intermediate milestones in addition to the eventual goal, especially in situations where reaching an overall aim is likely to be a protracted process.

Affix conditions to the achievement of the goals, such as additional objectives or prizes. Making the achievement of primary targets a prerequisite for moving on to the pursuit of higher-order and highly prized objectives is still another strategy. At the individual level, promotion or progress to a higher status or position is often dependent on the accomplishment of more or less precise objectives that are recognised as qualifying criteria. Consider instances when completing a certain course is required in order to enrol in a higher-level course. Meeting numerous intermediary objectives as a prerequisite for admission to membership in the European Union provides an intriguing instance of this system at the global level.

The Sustainable Development Goals are affected by this.

What conclusions can we make based on this broad examination of goal-setting as a governance tactic that might be useful to those tasked with conceptualising the Sustainable Development Goals as well as those in charge of putting them into practise throughout their intended lifespan from 2016 to 2030? Goal-setting must be customised to the conditions present in particular settings, just as analyses of the effectiveness of rulemaking emphasise the issue of fit or the need to achieve a good match between the nature of the problem at hand and the character of the institutional arrangements created to solve it.

It is important to first make a difference between the Sustainable Development Goals and the Millennium Development Goals when discussing goal-setting procedures. The concept of the Millennium Development Goals emerged in the 1990s as a way to address the worries of poor nations at a time when attention was placed on problems like climate change and biodiversity that were of special importance to rich industrial nations. This explains why the Millennium Development Goals place a strong focus on practical concerns of particular importance to poor nations, such as ending poverty, improving sanitation, and delivering elementary education. The Millennium Development Goals were really a part of a larger political agreement for the world. The attempt to create and execute the Sustainable Development Goals is, in many ways, a new and ambitious endeavour. Many participants have sought to emphasise continuity between the Millennium Development Goals and the Sustainable Development Goals, as evidenced by the efforts of the Open Working Group established to follow up on the mandate to formulate Sustainable Development Goals from the 2012 UN Conference on Sustainable Development. There are still significant issues with poverty, food security, fundamental human health, and other issues. However, in order to advance towards integrating the social, economic, and environmental components of sustain- able development under circumstances where the effects of human actions are significant at the global level, it is essential to find a way to balance these ongoing concerns with growing systemic challenges. This is a challenge in part because there is no agreement on the operational definition of sustainable development, much alone the effects of

the start of the Anthropocene on the pursuit of sustainable development. Yet it is clearly evident that a global agreement favoured by both developing and industrialised nations would be necessary to formulate and execute the Sustainable Development Goals. The politics of the issue might thwart attempts to reach an agreement on the details of such a pact or result in an accord with provisions that are too nebulous to provide policymakers any practical direction. But, this is not a good excuse for not putting up a concerted effort to meet this task.

The Sustainable Development Goals "should be action-oriented, concise and easy to communicate, limited in number, aspirational, global in nature, and universally applicable to all countries while taking into account different national realities, capacities, and levels of development and respecting national policies and priorities," according to the 2012 UN Conference on Sustainable Development's outcome document. What does this chapter's consideration of goal setting as a governance method have to say about meeting these demands? A New Global Partnership: Eradicate Poverty and Transform Economies through Sustainable Development and the report of the Leadership Council of the Sustainable Development Solutions Network, "Action Agenda for Sustainable Development" will serve as the foundation for my response to this question. These are certainly not the only well-known instances of thinking about how to formulate the Sustainable Development Goals; on the opposite. Yet, they provide prominent contributions to the public discussion around the Sustainable Development Goals and are useful for demonstrating the issues raised in this section.

Reduce the amount of separate objectives. The presidents of universities or charity organisations, who may start a fundraising drive with the only purpose of earning a certain amount of money, do not have the luxury of doing what those working to establish and execute the Sustainable Development Goals are able to achieve. In addition to being a multifaceted term, sustainable development is also under intense political pressure to incorporate goals that are specifically important to certain powerful parties. But, based on my research of goal-setting, there are strong arguments in favour of following the recommendation in the final paper from the 2012 UN Conference on Sustainable Development to "limit in number" objectives like the Sustainable Development Goals. There will inevitably be rivalry for top priority and disputes over the distribution of limited resources when a set of objectives that are both numerous and cover a wide range of problem areas are set forward. Consider in this context the High-level Panel report's 12 goals ranging from ending poverty and securing sustainable energy to ensuring stable and peaceful societies, or the Sustainable Development Solutions Network report's 10 goals ranging from achieving development within planetary boundaries to curbing human-induced climate change and securing ecosystem services and biodiversity. The procedures that led to the creation of these formulations are not difficult to understand. Therefore, there is little chance of achieving considerable progress towards a number of objectives that cover a sizable fraction of the general spectrum of human interests and ambitions. To effectively implement the Sustainable Development Goals, improved results will be required. In contrast, the Open Working Group's draught of the Sustainable Development Goals, which served as the foundation for the General Assembly's resolution on the subject and was first made public during the summer of 2014, contains 17 different objectives, ranging from ending poverty to achieving peace and justice for all.

Find a balance between political viability and ambitions; although less ambitious goals may be relatively simple to achieve, they are less likely to inspire populations to conduct the kind of

political struggle necessary to address underlying issues. Goals that are overly utopian or visionary, on the other hand, will be seen by players as being beyond the bounds of what is politically possible and will not succeed in acting as the uniting themes required to achieve genuine progress. This is why a desirable objective like ending poverty is one. While it is undoubtedly ambitious, it also appears to be within reach, particularly in light of the advancements achieved in combating poverty within the scope of the Millennium Development Goals. The years 2016–2030, as put out by a number of commentators, may be the time to complete the task of ending severe poverty. This is the primary objective of the High-level Panel report's first suggested objective. Yet, achieving some of the objectives outlined in the High-level Panel report and the Sustainable Development Solutions Network report would need a profound transformation of human affairs that is impossible to see occurring between 2016 and 2030. One example is the notion of guaranteeing stable and peaceful communities. Creating efficient strategies to safeguard ecosystem services is also an objective. These kinds of long-term visionary ambitions are quite acceptable. But, it is difficult to see how they will manage to strike a good balance between political viability and objectives for the years from 2016 to 2030.

Provide efficient methods for monitoring progress. Once again, the comparison to the capital campaign as an example is illuminating. Such a campaign has a single, operationally sound purpose. To monitor progress towards achieving such a goal, no complex system of objectives and indicators is required. In fact, it is feasible to produce a single chart that shows daily progress towards the ultimate aim using the analogy of a barometer. Under such circumstances, it is also rather simple to set temporal benchmarks. Clearly, the formulation and implementation of the Sustainable Development Goals include more complicated issues. Nonetheless, it is crucial to keep in mind the 2012 UN Conference on Sustainable Development's recommendation that the objectives be "concise and simple to communicate." The desire to eradicate poverty is strong for this reason, among others. It is quite simple to monitor progress towards achieving this objective as long as we specify an operational definition of poverty. Yet, fulfilling other objectives, such as generating equitable growth, guaranteeing good governance, and changing governance for sustainable development, poses serious difficulties for those attempting to gauge their success. The intricate and rather laborious process of creating sets of objectives and indicators to go along with each of the Sustainable Development Goals might be partially attributed to the need to provide operational measurements. Yet, it also poses certain normative-based core problems, including defining what we mean by equality or good governance.

Make the objectives appealing to the various behavioural motivations. The Sustainable Development Goals must be written in a way that appeals to individuals whose conduct is based on a variety of motivations since action has many different causes. One helpful difference in this context separates the logic of appropriateness, which is characterised by more normative concerns and considerations of principle, from the logic of consequences, which has incentives tied to calculations of benefits and costs. It's crucial to find ways to move forward that encourage actors to transcend limited notions of self-interest and to embrace principles side effects in cases where the goals address collective-action problems, such as protecting the earth's climate system, or the need to avoid unintended side effects. This implies a crucial justification for well-known objectives like securing high-quality education, ensuring healthy lifestyles, and fostering food security. In a crucial sense, everyone should support these objectives out of self-interest. Meeting

these objectives will be in everyone's best interest, including the affluent, since doing so will eventually help to ensure a secure, lively, and productive society that benefits everyone.

Integrate goal-setting with rule-making to produce efficient government systems. Finding solutions to combine goal-setting with rule-making will help governance systems function as effectively as possible. Setting goals serves an aspirational purpose by giving participants in a governance system direction and a sense of purpose. On the other side, rule making may provide the behavioural guidelines required to inform actors on how to behave in order to advance towards achieving objectives. Without guidelines, goals are likely to become nebulous ambitions that everyone agrees on theoretically but no one understands how to carry out in reality. On the other side, without overriding objectives, rules are likely to become onerous, bureaucratic regulations that no one views as necessary to fulfil. This shows that in the global endeavour to seek sustainable development, more has to be done to link goal formulation and rulemaking as governance practises. The pursuit of the Sustainable Development Goals is now taking place on a separate track with minimal involvement from those working on problems like disease vector control, greenhouse gas emission reduction, or endangered species protection. This is not meant to suggest that the attempt to create and carry out a set of Sustainable Development Goals for the years 2016–30 is incorrect. Yet, the prospects for gaining the buy-in necessary to make significant progress towards reaching properly ambitious objectives would suffer to the degree that this process runs without strong ties to attempts to solve a number of fundamental concerns. There are several dangers in pursuing the Sustainable Development Goals. But, it also offers a chance to distinguish between goal-setting and rulemaking as separate governance tactics, as well as to look at both the circumstances in which each is likely to be successful and the potential for combining them in a way that creates synergy. The process that led to the Millennium Development Goals in the 1990s was quite different from the approach that produced the Sustainable Development Goals in a major way. The later process is about developing a strategy to address the full range of human-environment interactions on a human-dominated planet and finding ways to track successes in this area. In contrast to the earlier process, which was motivated by political goals to engage developing countries and persuade them to join efforts to address issues of global environmental change, the later process is about promoting the use of technology to monitor progress in this area. There is no assurance that this process will deliver helpful results; it very well may have resulted in a list of objectives that is too large and too loosely worded to offer effective direction. But, the process does provide a chance to map out a global route for living sustainably in a time when 7 to 9 billion people have developed the potential to rule planetary systems.

CHAPTER 7

GOAL SETTING IN THE ANTHROPOCENE

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Adopted in 2000 by the UN General Assembly, the Millennium Declaration marked the beginning of a worldwide initiative to reduce poverty, advance women's equality, improve basic human health, and increase food security. The pursuit of the Millennium Development Goals has sparked interest in goal setting, as opposed to rule making, as a strategy for solving global problems, even though exogenous factors like economic growth and democratic reforms have played important roles in the progress made since the adoption of the MDGs. This increased interest in governance via objectives is seen in the demand for Sustainable Development Goals in "The Future We Want," the report produced by the 2012 UN Conference on Sustainable Development. Interest in the issues raised by the Millennium Development Goals continues to be high, as seen by the efforts to develop the wording of a set of Sustainable Development Goals that can be generally supported. Poverty, hunger, health, education, and gender equality topped the lists compiled by both official and unofficial contributors during the process. Nevertheless, formulating and defining a set of SDGs requires more than merely recommitting the whole community to tackle these well-known issues. The goal of sustainable development is to generate resilient socio-ecological systems on a local, regional, national, and international scale by integrating economic, social, and environmental aspects. Nowadays, scientists and an increasing number of decision-makers are aware that the globe has quickly turned into a system controlled by humans. The ensuing emergence of a new language, often grounded in the idea that the world is about to enter the Anthropocene, has significant ramifications for how we think about the pursuit of sustainable development at all scales.

In this chapter, we discuss the shift from the Millennium Development Goals to the Sustainable Development Goals, identify key aspects of the Anthropocene that have significant implications for goal-setting as a governance strategy, use a case study involving freshwater to illustrate the implications of this new way of thinking, and explore reasons why the effort to achieve the Sustainable Development Goals must overcome challenges that are greater than those currently faced. We end by taking into account the idea that creating a sustainability Grundnorm would be beneficial to those in charge of carrying out the Sustainable Development Goals between 2016 and 2030.

The Sustainable Development Goals replace the Millennium Development Goals

The Sustainable Development Goals and the Millennium Development Goals share a lot of common ground in terms of substance. Both sets of objectives place a premium on combating severe poverty, curing serious illnesses, and advancing gender equality. However, the Sustainable Development Goals highlight challenges that require significant behavioural changes on the part of residents of developed countries as well as efforts to improve the circumstances of those living in developing countries. Whereas the Millennium Development Goals marked the

beginning of a new era by laying out an ambitious agenda focusing on issues of particular importance to developing countries. The concept of sustainable development contains the crucial change. The 2012 UN Conference on Sustainable Development drew attention to the argument that further advancement in satisfying human wants and ambitions necessitates a steadfast commitment to protecting the earth's life-support systems.

The addition of "sustainable" by the UN also highlighted earlier successes. Twenty-five years prior, the World Commission on Environment and Development, also known as the "Brundtland Commission," defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" in words that have since become iconic. This conceptualization of sustainable development makes it difficult to gauge progress towards it. There has been a lot of discussion on how to operationalize the idea of sustainable development, but no clear agreement has been reached on the advantages of any given set of steps. Yet, framing the problem as one of sustainable development highlights the need of addressing human needs over the long term as well as the reality that human requirements go much beyond what is indicated by traditional measurements of income or wealth.

Steffen and colleagues noted that human activities have "equalised some of the main forces of nature in their breadth and influence" in their summary of findings from 20 years of study conducted under the International Geosphere-Biosphere Initiative. They went on to say that as a result, the earth system is now in a "no-analogue condition," which means that the past may not be a good indicator of the future. This transition, which Steffen and colleagues dubbed the "great acceleration," confronts us with a number of hitherto unanticipated difficulties that must be overcome in order to achieve sustainable development on a global scale. It also makes clear that in order to achieve sustainable development, better methods must be developed for controlling or directing collective and individual human behaviour, which has a significant impact on the future of the planet and, consequently, on the trajectory of social and individual welfare. Protecting the planet's life-support systems is a key component of several newly suggested definitions of sustainable development.

The planetary boundary is narrowing due to the interplay of biophysical and social processes. As old fish populations, forests, or fossil fuel supplies run out, we can no longer just switch to new ones; instead, we must learn to live within our means as a species on a world with limited resources and a constantly expanding population. In this situation, human behaviour in one location may have a big impact on distant locations.

For instance, the dramatic melting of sea ice in the Arctic, the sharp rise in ocean acidity endangering coral reef survival in the tropics, and the extinction of species in the Amazon basin rainforests are all primarily caused by greenhouse gases that are emitted by densely populated societies in the mid-latitudes. Biophysical systems are increasingly approaching thresholds or tipping points where little trigger events may result in significant nonlinear, irreversible, and sometimes sudden changes. Extreme occurrences that are unpredictable and so catch us off guard are happening more often as a consequence. The 2011 tsunami that the Great East Japan Earthquake caused, which later led to the disaster at the Fukushima Daiichi nuclear power plant, is a particularly dramatic example of a class of events that is becoming more and more significant and that include such chain reactions that have an effect across international

boundaries. So, achieving the Sustainable Development Goals would need a plan for dealing with these global, even planetary, processes while also continuing to make headway in resolving long-standing issues like reducing extreme poverty and curing life-threatening illnesses.

Beginning of the Anthropocene Era

The "great acceleration" was started by a confluence of socioeconomic and biophysical trends that started approximately in the middle of the 20th century. This convergence has transformed the whole planet into a human-dominated system. This transition, which took place over a number of decades, has influenced how we think about sustainable development through a number of channels, such as the Intergovernmental Panel on Climate Change's series of assessment reports and growing media attention to the introduction and rapidly expanding use of the Anthropocene concept. The rise of teleconnections, the emergence of planetary boundaries, an increase in nonlinear changes, and the growing significance of emergent properties on a global scale are specific features of the Anthropocene that have significant implications for efforts to meet governance needs in general and for the use of goal setting as a governance strategy in particular.

Teleconnections. Teleconnections are systemic interconnections that connect occurrences in the earth system that are far distant and seem unconnected. There are a lot of biophysical teleconnections. Increasing greenhouse gas emissions in the mid-latitudes are to blame for the Arctic sea ice meltdown and the tropical coral bleaching. Socioeconomic factors are others. The bursting of the housing bubble in the United States in 2008 is an illustration of how financial issues that arise in particular contexts may spark off worldwide chain reactions. Because of this, attempts to achieve objectives in one environment may be hindered or benefited by events in other environments or in apparently unrelated fields. This discovery has two implications for goal-setting. Secondly, objectives must be "global in character and universally relevant to all nations while taking into consideration diverse national realities, capabilities, and stages of development". As there are more impoverished people in certain regions of the globe than others, eliminating poverty is a goal with geographical dimensions. Nonetheless, important objectives like maintaining food security and combating climate change are increasingly necessitating global programming initiatives. Second, it's crucial to take into account connections between objectives that may not at first look seem connected. Notwithstanding its mixed results, the Open Working Group of the General Assembly on Sustainable Development Goals attempted to address this issue. The Objectives must avoid conflicts while also using synergies if they are to be effective in the long term.

Borders of planets. The boundaries of the world as a place for humans to live are becoming more and more obvious with a population of over 7 billion people projected to reach 9 billion by 2050. At a pace that is unprecedented, human factors are causing the depletion of the planet's natural resources and the disruption of its major cycles. This trend implies that error margins are becoming smaller. The "roving bandit" methods of depleting particular resourcesand then moving on to repeat the process in other ter- ritories must be replaced with methods that allow for the long-term sustainable utilisation of atmospheric, marine, and terrestrial systems. This means that whether we are addressing food, water, energy, or any other particular human need, we need to think in systemic terms and acknowledge that adopting a guiding vocabulary of stewardship will be a vital aim.

Nonlinearities. Instead of progressive, gradual, and reversible changes, we are increasingly confronted with spectacular, sudden, and irrevocable ones. The emergence of tipping points or thresholds, where relatively small trigger events can set off cascades of change that ripple through large systems, with consequences that are far-reaching and irreversible on a human time scale, is a key aspect of this aspect of the Anthropocene. Under these conditions, it is crucial to make a concerted effort to pinpoint tipping points far enough in advance to prevent human activities from exceeding thresholds and to set up self-correcting or negative feedback mechanisms that engage when the system is on the verge of reaching a point of no return.

Reacting after the incident used to be adequate, but today we need to act globally and before the fact. Instead than concentrating on the activities of future generations, the Sustainable Development Goals must encourage behavioural change among members of the present generation.

Emerging qualities. The knowledge that the world and its main systems, including the climate system, are immensely complex is one crucial understanding resulting from the aforementioned discoveries about the Anthropocene. The repercussions of apparently normal activities that have large-scale and unexpected effects often catch us off guard. A good example is the climate system.

Negative feedback mechanisms that will help to temper the consequences of increasing greenhouse gas concentrations in the atmosphere may potentially be present in the earth system. Yet, the possibility that positive feedback mechanisms would operate to expand and increase the effects of human drivers is at least as probable. This implies that making decisions in the face of uncertainty is impossible. In the face of our imperfect understanding of complicated systems, we must resist becoming paralysed. Nonetheless, this development does indicate that objectives should be stated in a way that allows for quick modifications in the event of systemic shocks.

An Instance: The Amount and Characteristics of Freshwater

We examine the consequences of the analytical findings for the example of freshwater in order to convert them into practical issues. Similar observations might be made with relation to other pressing challenges like providing food for 10 billion people, weaning industrial nations off of fossil fuels, or easing the stresses that are causing an increasing number of species to go extinct. The example of fresh water, however, is intriguing for a number of reasons. Several informed experts predict that freshwater issues will emerge as the most important global problem of the twenty-first century. On a local level, guaranteeing sufficient freshwater supplies is a long-standing challenge, but regionally and even globally, freshwater-related problems have become top priorities. Moreover, there is a strong connection between freshwater and a number of other pressing issues, such as achieving food security, meeting the urgent need for better sanitation, and producing enough electricity. The subject of freshwater is taken up in later chapters of this book in a number of substantive applications. The earth has enough readily available freshwater to fulfil the requirements of the current global population. The most pressing issues with regard to water are the distribution of water or the distances between densely populated areas and the locations of major freshwater reservoirs, the economic and political frameworks we have established over time to regulate the distribution of limited water resources among human users, and the unintended effects of a wide range of human activities on water quality. So, a Sustainable Development Goal concentrating on water must pay attention to issues of distribution, allocation,

and pollution rather than focusing only on the issue of quantity, as is the case with other top priorities like food security.

The amount of water on the world is very unevenly distributed. While there are not many people living there, there is a lot of water. Although the northern and particularly the northwest regions of China have serious water shortages and growing desertification, the southern region of the nation has a sufficient amount of water. Due to many years of extreme drought, water shortages have reached crisis levels in the West and Southwest of the United States, two dry areas. Moreover, it is anticipated that the effects of climate change would make these disparities worse. The general consensus is that wet regions will get wetted and dry areas will become drier as a result of climate change. Regional developments may amplify the effects of these trends in certain places. The Asian monsoon system might be disrupted, for instance, and saltwater incursions brought on by increasing sea levels could flood vast coastal regions and poison freshwater sources in nations like Bangladesh. Although the main rivers in Europe often experience significant floods, the Colorado River in western North America has recently had record low water flows. In these circumstances, several options for achieving water security entail substantial technical endeavours and high politics. Los Angeles, a fast expanding metropolis located in a dry climate, has made legendary attempts to improve its water supply by purchasing water rights in far-off regions and transferring the water over great distances via aqueducts. In one of the largest engineering projects in human history, China is spending the equivalent of tens of billions of dollars to transport vast amounts of water from the more populated south to the parched north. Planners in arid nations like Israel have made significant investments in desalinization to solve the issue of water supply, despite the fact that doing so is costly and energy-intensive. An alternative approach to solving this issue is to encourage the use of "green" water, a system in which food and other commodities that need a lot of water are produced in wet areas and sold in dry areas in exchange for goods that are more suitable for production in dry places. Yet, this tactic needs stable peacetime environments that support prosperous business. It is theoretically possible to purify water such that it may be reused on a wide scale for a variety of uses, including human consumption. The implementation of this method on a big scale is hampered by widespread opposition to the use of recovered water, which is generally motivated by fear or prejudice rather than logical considerations.

Many of these problems are difficult to solve because of dated or inadequate institutional structures. In California, for instance, agriculture uses about 85% of surface water and the majority of the state's groundwater, despite the fact that it only contributes 3% to the state's economy and that there are technologies that could significantly reduce water consumption without affecting production. The issue is mostly caused by the US federal government subsidising agricultural water users, who are thus disincentivised to invest in the necessary technology. Moreover, this issue is not only present in the US. Between 70% to 90% of the freshwater that is available worldwide is utilised to irrigate agricultural land. Yet high water usage is not only a result of ineffective agriculture. In urban and suburban areas, there are several opportunities to lower the demand for water by implementing more effective water usage systems or changing lifestyles that are oblivious to the risks of water shortages. Nonetheless, the majority of users are resistant to suggestions that they change their water-intensive lifestyles and the incentives to conserve are minimal. Sometimes, necessary management regimens are just lacking. For instance, a massive groundwater reservoir called the Ogallala Aquifer underlies a

sizable portion of the middle of the United States. Users are, however, exploiting this resource at a rate that is significantly faster than the natural recharge rate since it is a common pool resource whose appropria- tors are not subject to a unified, much less effective, regulatory structure. They are, in fact, extracting fossil water in an unsustainable manner.

At times, decisions made on how to utilise water are closely related to matters of national security. Examples include the flooding of northern Sudan brought on by the building of the Aswan Dam in Egypt in the 1950s and the more recent controversy around the decrease in water flowing into Iraq as a result of the construction of the Atatürk Dam in Turkey. Those who feel that these kinds of agreements would jeopardise the national security of nations that rely on others as suppliers of key commodities often argue against growing dependence on "green" water. Similar issues exist in situations like the Arab-Israeli conflict, where fighting over the few water resources in the Jordan River and the Sea of Galilee has long been an unresolvable aspect of the hostilities. In these situations, the interference of high politicians precludes the possibility of technological solutions to water issues.

Water quality problems are often evident, even when sufficient amounts of water are available. Most of the time, coping with unintentional outcomes or side effects of actions made with good intentions is what this is about. A well-known example is the nitrogen and phosphorus runoffs that result from the improper or uncontrolled use of chemical fertilisers to boost agricultural productivity. Massive freshwater basins are now often subject to algal blooms that render their waters unsafe for human consumption and force the closure of portions of these water bodies for different human purposes. Examples include Lake Tai in China and Lake Champlain in the United States. Similar observations should be made about industrial wastes that are permitted to enter waterways without sufficient treatment procedures. It is fairly unusual for rivers to set on fire due to pollution in certain conditions. In each of these situations, there is a fundamentally political issue. It is difficult or even impossible to address these issues of water quality effectively even when there is room to do so by removing or controlling these side effects because doing so is likely to produce losers as well as winners, and the losers frequently have a significant capacity to resist change.

The Millennium Development Goals' emphasis on the problem of providing freshwater is still a source of worry. Unresolved is the conflict between the moral case for recognising a sufficient supply of freshwater as a human right and the effects of privatisation, which have increased the cost of freshwater, particularly in many rural regions. We cannot let this problem slip our minds. A far bigger worry, though, is how the Sustainable Development Goals will address the water problem.

This partially involves forecasting massive processes, such as changes in the hydrology of significant river systems, which endanger the way of life for tens or even hundreds of millions of people. It partly calls into question institutional structures that, although they could have been appropriate in the nineteenth or even the twentieth century, result in unsatisfactory results in the modern world. Finding solutions to address the requirements of the bottom billion people is just one aspect of the difficulty of dealing with the amount and quality of water. It is a problem that is present at all scales, from the local to the global, and it will call for fundamental adjustments to outmoded institutions as well as deeply ingrained behavioural patterns that are just as common in the first world as they are in the third. Significantly, despite the fact that they must be taken into

account simultaneously in developing global solutions to address global concerns, these difficulties include various problems in various locations, necessitating solutions customised to various conditions.

The Sustainable Development Goal is affected by this.

The goals "should be action-oriented, concise and easy to communicate, limited in number, aspirational, global in nature, and universally applicable to all countries while taking into account different national realities, capacities, and levels of development and respecting national policies and priorities," according to the 2012 UN Conference on Sustainable Development's outcome document. This set of demands is reasonable yet strenuous. With these demands in mind, how can we make sure that the Sustainable Development Goals become a tool for altering human behaviour? By separating the two phases of the Sustainable Development Goals—target formulation and goal achievement—we can respond to this question. The main challenge in setting goals is to do so in a way that acknowledges the fundamental changes in the earth system brought on by the onset of the Anthropocene while also highlighting the continued significance of concerted efforts to eradicate poverty, ensure food and water security, improve human health, and in other ways improve the quality of life of those in developing countries, as intended by the Millennium Development Goals. The main obstacle to achieving goals is successfully directing a broad range of human endeavours in the directions demanded by the new Sustainable Development Goals. For the Sustainable Development Goals, this steering task is much more difficult than it was for the Millennium Development Goals. As a result, this section is devoted to a discussion of how to accomplish the set of Sustainable Development Goals that were created via the UN agenda-setting process for the years 2016–2030.

Sustainable development is the ultimate transgenerational initiative. As a result, it has three features that make it a difficult governance task. First, there are significant time gaps, often lasting far beyond one human generation, between mitigation actions and mitigation impacts. Second, despite significant advancements in social and natural research over the last four to five decades, our knowledge of how human activities affect the dynamics of the earth system is still insufficient and tainted by significant uncertainties. Thirdly, several SDGs deal with the supply of global communal goods of a kind that connects these commodities to a variety of human endeavours while also leaving them beyond the purview of any "single best effort" solution.We concentrate on the effects of time delays in this section due to space constraints. We focus on three key consequences in particular: significant intergenerational disparity in participation and political power, temporal inconsistency, and asymmetric uncertainty.

The farther into the future we gaze, the greater the uncertainty, other things being equal. There is a significant gap between our capacity to estimate the costs of mitigation measures and our capacity to predict the long-term benefits of such efforts, which is inherent in problems like climate change and biodiversity loss. A casual examination of government initiatives and public discourse reveals that although long-term harm is averted, short-term repercussions of mitigation attempts are often conceptualised in terms of current expenses. In this context, uncertainty will be more significant when determining the benefits of mitigation than when determining the costs of mitigation. In addition, the majority of people are probably more inclined to conceive of uncertainty in this context as just referring to the "negative" error margin than to the whole range of possible outcomes, including those that are both more and less positive than the average or

median estimate. These asymmetries will distort the cost/benefit ratio by lowering the anticipated net benefit of mitigation the more pronounced they are. The well-known human propensity to respond more strongly to the possibility of a specific loss than to the possibility of a gain of a comparable magnitude may make problems worse. Ambitious mitigation initiatives will confront even greater obstacles than those indicated by standard rational choice theory, to the degree that policymakers follow this trend.

Temporal delays can have additional effects on incentive systems. The time-inconsistency issue is one impact that is probably present. When an actor's best plan from today for a future period of time is no longer the greatest option when that time comes, this is known as time consistency. An ordinary example will show how this technique works. Imagine you have started a routine fitness regimen to enhance your health. Even if you are certain that the programme as a whole will provide significant net advantages, you are not required to have a favourable opinion of each training session inside the programme. One defection would not significantly affect long-term health benefits, but it may increase short-term happiness. Technically speaking, despite projections of significant programme results, the cost/benefit analysis for this specific training session reveals a negative balance. The cost/benefit analysis for the plan as a whole and the analysis for the specific microdecisions necessary to execute the plan are incongruent, which is the root of the time-inconsistency issue. Even if just one person makes all the choices, this kind of discord may still happen. It is far more likely to happen for programmes that have to endure several changes in leadership. Thus the likelihood of many defec-tions from the master plan increases as there are more instances of incongruity.

Discounting, a process used to calculate the present value of future benefits and expenditures, is another possible source of distortion. Discounting conventional wisdom gives present advantages a greater value than future ones for two key reasons: "Human impatience" and the belief that salaries will rise. Among others, Stern and Schelling have questioned the applicability of traditional discounting theory to transgenerational issues like global climate change. Moreover, when preferences are aggregated to pick policies, future stakeholders will not have the chance to express their concerns when the effects of present policies manifest decades—or in some instances, centuries—later. We confront enormous intergenerational disparities in participation and political power while defining the Sustainable Development Goals. Those who are in a position to implement effective mitigation measures must bear the majority of the costs but will only receive a portion of the benefits derived from the damage avoided, as we noted above due to the lengthy time lags between the adoption of measures and the realisation of their benefits. The greater the difference between the material self-interest of the "upstream" generation and the interests of the "downstream" generation, the smaller that fraction. We anticipate that individuals who really care about the welfare of their children, grandkids, and great-grandchildren will help to close this gap to some degree. But, if Schelling is correct, individuals who stand to gain the most from mitigation measures will be far more "remote" than they already are, not just in terms of kinship but also in terms of geography, ethnicity, culture, and other dimensions of collective identities. The greater the perceived distance to the recipients, all things being equal, the less willing people are to pay for advantages that will be largely enjoyed by others. In other words, there is a significant gap between the ambitious goals and targets outlined in the Sustainable Development Goals on the one hand, and the actual policies and practises used to achieve these

goals on the other. This combination of diverging incentives and extreme power asymmetry creates a serious risk of vertical disintegration of sustainable development programmes.

CHAPTER 8

CREATING INSTITUTIONS ON A NORMATIVE FOUNDATION

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One strategy features the introduction of institutional arrangements, such as the appointment of ombudspersons,guardians, or similar types of agents mandated to speak on behalf of future generations. The position of ombudsperson or commissioner is a concept employed by several governments to defend individual rights. Fewer countries—Hungary and Israel being the pioneers—have created offices of commissioners to defend the collective rights of future generations. Yet in none of these examples have the offices turned into long-lasting institutions. In Hungary, the functions allocated to this agency were taken over by the Office of the Commissioner for Fundamental Rights in 2012. In the instance of Israel, the position of Commissioner for Future Generations was dismantled after five years. It would be premature to appraise the possible function of ombudspersons or commissioners on the basis of experience with short-lived models from a few nations. Nevertheless it is worth highlighting that, so far, institutions of this sort have a greater track record in preserving the rights of people and small groups than in safeguarding the collective rights of future generations to enjoy the advantages of the earth's life-support systems.

Part of the rationale may lay in the fact that the two tasks vary in fundamental areas. In traditional human rights fields, ombudspersons or trustees are dealing with extremely precise and well-defined rights codified into international agreements and protocols as well as state laws and regulations. As a result, rights infractions are typically susceptible to identification as they occur and may be subject to standard legal proceedings. Additionally, the victims of such breaches would generally belong to living generations and are frequently simple to identify. By contrast, the collective rights of future generations to benefit from the earth's life-sup- port systems generally are described in more generic terms, are harder to monitor experimentally, and are more difficult to enforce using regular legal processes.

At times, both national and international courts have interpreted the law as mandating intergenerational justice and given legal standing to people attempting to represent future generations. In its advisory opinion, "Legality of the Threat or Use of Nuclear Weapons," for example, the Inter- national Court of Justice viewed the effect of nuclear weapons on the well-being of future generations as a significant element. Yet it did not advocate for the prohibition of nuclear weapons for this reason. Yet, the Court noted that "the deployment of nuclear weapons may entail a major hazard to future generations". It is interesting as well that the Court accepted a comprehensive definition of the environment as reflecting "the living space, the quality of life and the very health of human beings, including generations unborn". Judge Weeramantry, in his dissenting opinion, argued that "the rights of future generations have woven themselves into international law through major treaties, through juristic opinion and through general principles of law recognised by civi- lized nations".

Several domestic courts have provided procedural safeguards for future generations by giving them legal status. In 1994, the Supreme Court of the Philippines granted standing to 44 juveniles to challenge the government on behalf of themselves and members of future generations concerns the repercussions of unsustainable logging in the nation. In 1999, the Supreme Court of Montana in the United States determined that the environmental provisions of the state's constitution pro- vend standing to residents and environmental organisations to suit for environmental injuries to public resources. Unfortunately, not all such initiatives have been successful. In 2001, the Seoul Administration Court of the Republic of Korea, for example, denied legal standing to a group of youngsters who jointly filed a case to block a government-led large-scale coastline reclamation project. Without question, the judgement of the Seoul Administrative Court represents the rule rather than the exception among domestic courts across the globe.

These findings do not substantiate the conclusion that institutional change cannot succeed in preserving the interests of future generations. Taken together, however, they do imply that a robust normative basis will be required for institutional arrangements to become effective vehicles for accomplishing this aim. This recommends a second, by no means mutually exclusive, method predicated on the implementation of a fundamental sustainability principle or, in other words, a sustainability Grundnorm. Such a Grundnorm would govern sustainable development policies and practises by functioning as a basic principle of law, equal to other fundamental concepts such as justice, equality, and freedom. At now, both national legal systems and international law lack such a basic prin- ciple banning substantial or permanent damage to the integrity of ecosystems based on the rights of future generations.

The idea of a Grundnorm is usually recognised as a foundational norm against which all other legal norms may be evaluated and confirmed. A Grundnorm is a basis upon which a legal system is founded. A constitution is an excellent example of a Grundnorm: It informs and validates all parts of the legal system. Conceptually, a Grundnorm exists independently of a legal system, yet underlies legal reasoning in the form of an inference rule. The validity of a constitution, for example, does not originate from within but outside the legal system. A Grundnorm is, therefore, "a question of political philosophy rather than legal doctrine". This perspective varies from that of Hans Kelsen and is closer to Immanuel Kant's notion that every positive rule must be established in a natural law of popular acceptability and reasonableness to avoid pure arbitrariness.

Such a conception makes it feasible to conceive of the principle of sustainability as a Grundnorm. The existence of a sustainability Grundnorm hinges on the premise that respect for planetary limits defining the "safe operational zone for humankind with regard to the Earth system" represents a moral imperative in the Kantian senses. In the specific context of global governance, we may interpret the principle of sustainability as a superior norm that gives all international regimes and organisations a shared purpose to which their more specific activities must contribute, thereby lending coherence to what otherwise might become a disparate or even internally inconsistent collection of arrangements. Such a use would match core principles, such the preservation of human rights or the promotion of free commerce, that serve as tests of the legitimacy of state conduct in other problem fields. In the absence of a sustainability Grundnorm of equivalent weight, the notion of sustainable development lacks power as a foundation for safeguarding future generations and the environment.

Ideally, a sustainability Grundnorm would encompass a well-defined and widely agreed vision for long-term sustainable development beyond 2030. As in the Millennium Declaration, the report of the Open Working Group on Sustainable Development Goals highlights poverty eradication as "the biggest global issue confronting the world today". The desire to "end poverty in all its manifestations everywhere" undoubtedly needs urgent consideration. Yet from the viewpoint of attaining long-term sustainable development, the pro- tection of "planetary must-haves" has to be acknowledged as an essential prerequisite for development of any sort. All ethical standpoints, including the prevalent anthropocentrism, endorse this prop- osition since the wellbeing of both present and future generations relies on preserving the earth's life-support systems. Of course, this argument is not new. Similar terminology occurs in a number of prominent writings, including the 1972 Stockholm Declaration on the Human Environment, the 1982 Global Charter for Nature, the 1992 Rio Declaration on Environment and Development, and "The Future We Want." Yet these affirmations are not adequate. They need to be backed up by the practises of states and other actors. The formation of a sustainability Grundnorm involves acceptance of the idea that it is a primary obligation of states and nonstate actors alike to "conserve, preserve and restore the health and integrity of the Earth's ecosystem". What the integrity of the earth's ecosystem will mean in the Anthropocene remains a subject of debate. But for the purpose of implementing goal-oriented governance mechanisms for sustainable development, such as the Sustainable Development Goals, it is sufficient to agree on a practical, anthropocentric definition of global ecological integrity such as the combination of the biodiversity and ecosystem processes that characterised the biosphere as a whole during the Holocene. Because it is the only state of the earth system that we know for sure can support contemporary society, the Holocene provides an appropriate precautionary reference point for this purpose.

Adopting and implementing a sustainability Grundnorm would require a major reform of existing and emerging international governance systems. At the global level, the international community is in need of a new, constitution-type agreement that will redefine the relationship between humans and the rest of the community of life. Potential candidates for such an agreement include the Draft International Covenant on Environment and Development, which is a product of decades of work of leading scholars and practitioners with an aim to codify existing environmental law. The draught covenant reflects the sustainability Grundnorm in its core in the form of a fundamental principle of respect for "nature as a whole and all life forms" as well as the "integrity of the Earth's ecological systems". Ultimately, a reform of the charter of the United Nations may be required.

Even though this integrating effort is desirable, it will take time to implement this Grund- norm. Nonetheless, if widely adopted, such a Grundnorm would be beneficial in a number of ways. It may be used as a framework for establishing intertemporal priorities, encouraging the current generation to consider how to best balance their demands with those of future generations while still allowing for some degree of flexibility. This entails acknowledging that any effective plan for ensuring that future generations have access to opportunities on par with those enjoyed by the present generation on a world ruled by humans must include the conservation of the planet's life-support systems. In order to increase the coherence of the whole body of existing arrangements, a sustainability Grundnorm may also be used to guide the interpretation of current laws and practises. Our case study on water made clear that, regardless of how much they help to attain

food security, actions done to increase agricultural productivity may seriously degrade water quality. The Grundnorm, which is a potential "adjudicatory norm," treats the Sustainable Development Goals and their targets as tools for achieving the same fundamental goal and, therefore, as components of a common programme. This approach could foster cooperative relationships between the Sustainable Development Goals and their targets.

For the same reason they are reluctant to embrace any terminology that seems to downplay the significance of economic growth, developing nations may be hesitant to support this approach. Yet, it would be unfounded to worry that a sustainable Grund-norm would protect the privileges of the wealthy. Rich people's excessive consumption poses the greatest danger to the planet's ability to sustain life, not poor people's struggles to meet their most basic requirements. The sustainability objectives would help to outline the implications of a sustainability Grundnorm that would acknowledge everyone's entitlement to greater well-being. Resource distribution among the members of any generation would be affected by a sustainability Grundnorm. Yet, this is not the main issue. Instead, the primary goal of stating such a Grundnorm would be to draw attention to a need for human well-being at all times and in all locations.

Although it is understandable that some view the formulation of the Sustainable Development Goals primarily as a means of kicking off the second iteration of the Millennium Development Goals, the actual challenge of framing the Sustainable Development Goals and effectively implementing them is more difficult. In this context, goal setting as a governance strategy entails simultaneously addressing the legitimate concerns of those working to complete the Millennium Development Goals and those addressing the new dangers to human well-being brought on by the onset of the Anthropocene in order to protect a safe operating environment for humanity. A typical reaction to these kinds of situations is to take an inclusive stance and incorporate the interests of all important constituencies in the list of suggested Sustainable Development Goals. It also needs a "backcasting" strategy to begin, which entails creating an ideal future scenario. This, however, does not guarantee success. The 2012 UN Conference on Sustainable Development's conclusion paper reminds us that the objectives should be "concise" and "restricted in number". The success of this significant attempt to create a novel course in the field of international governance will much depend on the capacity of those in charge of developing the Sustainable Development Goals to find a method to satisfy this criterion. The ability of the UN system and its member states to support these objectives in the ensuing phase will depend on their capacity to set up institutional arrangements and operational procedures that combine the requirement for inspiring high-level leadership with the mobilisation of significant stakeholders and essential resources at various levels.

Establishing International Goals to Improve National Government and Policy

The deliberate and authoritative direction of society processes by political actors is what we mean by governance in this context. Thus, governance encompasses customary actions by governmental actors, such as laws, policies, and regulations; planning techniques, rule systems, and procedures at subnational levels; and some actions by nongovernmental actors, such as standards established by civil society networks or public-private partnerships, so long as these actions include a claim to authority, have some legitimacy, and are intended to guide behaviour. While there are some disagreements in the literature on the precise definition of governance, everyone agrees that its two main facets are authority and guidance. Identifying problems,

defining agendas, obtaining and analysing information, negotiating, establishing policy objectives, and putting those objectives into action and monitoring them are all aspects of governance. Lastly, internationally agreed-upon objectives, like the Sustainable Development Goals, have the potential to be effective governance instruments that have a significant influence on how governments, international organisations, and nonprofit actors behave. Two linked chapters in this book explore this topic.

This chapter focuses on the three fundamental characteristics of good governance—good governance, effective governance, and equitable governance—which we examine in further depth. According to our definition, "good" governance emphasises qualitative traits like responsibility, openness, involvement, and the rule of law. The ability of the government to solve problems is improved by effective governance. The emphasis of equitable governance is on the procedures and distributive effects of governance, as well as the need to safeguard the interests of underprivileged and vulnerable groups.

The rise of governance on the international development agenda and its inclusion in the Sustainable Development Goals are covered in the second portion of the chapter. We also talk about how different governance frameworks have had a big influence on the metrics that are available and how governance is integrated into sustainable development. The final part of the article examines the three types of governance and how they relate to sustainable development. The fourth part then discusses the benefits and drawbacks of pursuing governance as a stand-alone aim or as an integrated goal and target inside multilateral organisations and agreements.

The International Agenda for Governance

The World Bank and the International Monetary Fund were largely responsible for the rise of governance on the global agenda in the 1990s. The operationalization of governance by these institutions was essentially technocratic in nature, blending institutional economic theory, modern public administration, and a Weberian perspective of the state. Moreover, they have given less emphasis to "effective" or "equitable" government, focusing instead on the "good governance" component, which includes concerns like corruption, transparency, accountability, and the rule of law. Also, these companies have focused more on the governance process than on the short- and long-term outputs or effects of governance. In practice, international financial institutions mandated experts to design governance measures, and then used such measures to first target aid and eventually to make aid conditional upon “good” governance indicators. Although promoting openness, responsibility, and the participation of civil society inside nations, these ideas did not always transfer into the actions of international financial institutions.

Prior debates had mostly been technical and concentrated on the creation of complicated metrics, with an emphasis on problems like reducing corruption, promoting the rule of law, and improving openness, accountability, and participation. Its emphasis changed in the 1990s to include the intricate political networks that underpin institutions of government. This indicated a change in emphasis on governance from a supply-side focus on encouraging specific institutions to enhance their governance to a demand-side focus on supporting players in local and global settings to demand better governance. The World Bank and the International Monetary Fund continue to be at the forefront of most of this effort, despite the fact that a larger variety of players are now arguing markers of good governance. These discussions have caused these players to change their strategy from the one-size-fits-all style of governance that dominated

many of the previous stages to one that is more nuanced, as highlighted in the 2010 Seoul Development Consensus for Shared Growth.

While the theory that good governance would promote economic development is widely accepted in the policy community, its veracity has not been shown incontrovertibly. Several nations that have had substantial economic development after 1945 have done so in corrupt and autocratic environments. Similar to how the liberal governance model from Western Europe and the United States has not proved to be as unproblematic or as homogeneous as the concept suggests. Therefore, it's possible that strong governance supports economic development rather than the reverse.

According to several research on this topic, "countries have only improved governance with growth, and that good governance is not a required prerequisite for development". For instance, Kwon and Kim contend that "empirical data does not support the notion that excellent governance results in the decrease of poverty. Only middle-income nations, not least-developed ones, are alleviated of poverty by good governance. As a result, even if it is probable that institutional failure and economic poverty are related, this does not imply that the link remains true at all levels or contexts of governance or development. Even the agenda for good governance to reduce corruption has had difficulty institutionalising and has had mixed success. Certain empirical research in developing nations have refuted the claim that corruption hinders growth, and political elites have gained control of various anti-corruption initiatives. Nonetheless, according to some research, "corruption has a detrimental impact on per-capita GDP growth". All of this is despite the fact that there are significant moral arguments in favour of ongoing anti-corruption measures, including arguments based on justice, legitimacy, and public confidence. Regarding sustainability more specifically defined, the governance agenda has always placed an emphasis on sustainability in developing nations, often referencing the World Bank article From Crisis to Sustainable Growth: Sub-Saharan Africa: A Long-term Perspective Study. Yet, the international economic institutions prioritised governance for continued economic development above environmental or social sustainability in this report and in the majority of the debate that followed. Moreover, the national level of governance has received the majority of attention so far. The discussion regarding international standards for better governance is relatively recent, even though considerable research has examined the importance of better governance for the effectiveness of national programmes, from welfare to environmental protection. While ideas like "good governance" have long been at the centre of the governance discussion in development cooperation, there are currently few international agreements or organisations that provide specific guidelines for this notion. For instance, the 2000-adopted Millennium Development Goals omitted clear targets for governance. Others claim that this omission has severely reduced attempts to alleviate poverty globally and confined the emphasis away from the larger Millennium Declaration, which focused on equality, human rights, and other aspects of a more comprehensive governance agenda.

During the Sustainable Development Goals talks, governments started to address this issue. Governments converged on the conclusion that "good governance and the rule of law at the national and international levels are essential for sustained, inclusive and equitable economic growth, sustainable development, and the eradication of poverty and hunger" at the 2012 UN Conference on Sustainable Development. Parallel to this, the 2014 UN Development Programme study said that the Sustainable Development Goals' pillars are supported by the effectiveness of

governance, which plays "a defining role". Similarly, the UN Environment Programme's extensive Foresight Project highlighted "aligning governance to the problems of global sustainability" as the most important new issue pertaining to the state of the environment worldwide.

Several nongovernmental groups and individuals have also made calls for particular international governance objectives. In order to achieve "a fundamental shift—to acknowledge peace and good governance as key parts of prosperity, not optional extras," the UN High-level Panel of Eminent People proposed that governance should be included in the Sustainable Development Goals. Similar calls were made in the "Action Agenda" put out by the Sustainable Development Solutions Network in 2013 and in a declaration released in 2014 by 50 civil society groups. Some groups have urged for incorporating governance into issue-specific objectives, such as those pertaining to food, water, or gender equality.

Others have attempted to draw a connection between improvements in national governance and comparable changes in institutions of global governance. For instance, the International Development Law Organization recommended that the rule of law, which is frequently regarded as a component of the good governance agenda, be relevant to the global legal and institutional frameworks for trade, investment, intellectual property, technology transfer, and addressing climate change—where fairer rules would create a more equitable, inclusive, and sustainable model of development. Objectives for improved governance might potentially be included into many international organisations and agreements, including most multilateral environmental accords, therefore this topic theoretically extends beyond the restrictive scope of the Sustainable Development Goals.

Governments endorsed governance as one of the 11 theme areas for dialogue around which the Sustainable Development Goals were developed as a result of these varied contributions. According to the UNGA 2015's 2030 Agenda for Sustainable Development, "We envision a world where democracy, good governance, and the rule of law are essential for sustainable development, including sustained and inclusive economic growth, social development, environmental protection, and the eradication of poverty and hunger." In addition, Sustainable Development Goal 16 instructs governments to "promote peaceful and inclusive communities for sustainable development, ensure access to justice for all, and construct effective, accountable, and inclusive institutions at all levels" without specifically mentioning the word "governance." This objective has as its aims the development of the rule of law, the reduction of corruption, the improvement of institutional accountability and involvement, as well as decision-making transparency. The integration of governance was also required by some of the other particular objectives, such as the development of integrated water resource management at all levels.

The distinctive ways in which the global governance issue has grown demonstrate the need of highlighting the three distinct governance aspects, as this chapter's conceptualization of them. Although most suggestions for governance goals involve the premise that "excellent governance" would lead to "effective" and "equitable" government, the operationalization of governance obscures this connection. Such potential links are not operationalized nor clarified by the existing governance measures and indices. For instance, in Central America, the governance agenda has mainly ignored private capital accumulation and the aggravation of inequities while focusing on

governmental wrongdoing. Hence, a causal relationship between one aspect of governance and another cannot be established empirically and requires investigation on its own terms.

Sound Government

As our discussion has demonstrated, the pursuit of "good governance," which encompasses issues as diverse as participation, transparency, accountability, public access to information, combating corruption, upholding human rights, and strengthening the rule of law, has drawn the most attention of all aspects of governance. Yet, each of these factors raises difficult concerns regarding the advantages of a "one-size-fits-all" strategy that often mimics developed nations' political systems versus strategies that take into consideration various political environments. Considering the wide definition of good governance, there are several indicators that use different mixes of indexing, expert coding, and perception polls to gauge the "quality of governance" at the national level.

For instance, indices for excellent governance sometimes combine many measurements to provide overall governance ratings for nations. The Worldwide Governance Indicators, the Ibrahim Index of African Governance the Government Effectiveness Indicator, and the Social Institutions and Gender Index are a few examples. For more information, see generally Gisselquist.

Inviting local or international experts to complete questionnaires and quantifying the findings is a second method of evaluating the effectiveness of national government. Examples include the Democracy Index, Freedom in the World Index, Economics and Country Risk Index, Rule of Law Index, Global Right to Information Rating, Transformation Index, and the Quality of Government data set.

A third approach includes randomly selecting samples from the overall community or conducting public surveys that concentrate on how certain concerns are perceived by specific demographic segments. The World Values Survey, the Global Barometer Surveys, the Gallup World Poll, and the Corruption Perception Index are among examples.

Using national peer-review procedures is a fourth method of creating indicators for good governance that are specific to a certain country. The mechanism may build on and go beyond the aforementioned indicators, even if they do not generate cross-country measures of governance. Examples include the African Peer Review Mechanism and the peer-review procedures used by the Development Assistance Committee of the Organization for Economic Co-operation and Development.

As was already said, international financial institutions took the lead in developing rigorous indices of governance in numerous ways. Their indicators often underlined the need of rule of law, anti-corruption, and property rights protection as essential components of effective governance. The World Bank's Global Governance Indicators are the most well-known indexes on governance, using information from 32 sources at the time of writing to create complex multi-indicator ratings for six key aspects of governance. The index, which has not gone unchallenged, significantly depends on elite opinion polls and generally overlooks relationships between various variables.

Yet, there are other measures of effective governance in addition to the Global Governance Indicators. Others are compiled by activist organisations, think tanks, organisations that conduct

economic research, or other international organisations and, as a result, frequently carry the bias of their respective organisations, either implicitly or explicitly. This may reduce their legitimacy in some nations and contexts. Yet, these measurements' methods and experiences might still be valuable for evaluating overall progress towards improved governance. One illustration is the "g7+" alliance of fragile states' overlapping system of indicators, which consists of a few universal indicators that all participating countries agree upon and is supplemented with a menu of indicators from which countries can choose those they deem most appropriate and other indicators created in accordance with their own national contexts. There is also room for innovative proxy indicator usage and the development of new indicators to include new aspects of good governance.

However the majority of good governance's goals and measures are up for political debate. Although there may be widespread agreement on certain goals, such as stopping corruption or combatting money laundering, the indicators for these goals may be in question. Particularly developing nations are cautious about the possibility of "good governance" aims and indicators being included into designing programmes for trade advantages, technology transfer, or government development aid. This issue could be resolved by setting goals that concentrate on the entire efforts made to execute agreements. For instance, a 2014 civil society initiative highlighted transparency and information freedom goals in programmes for sustainable development. Such reporting requirements, however, may potentially be burdensome for poor nations with few human and technological resources. As a result, it becomes crucial to facilitate governance for monitoring and reporting in order to increase accountability and foster transparency for developing nations. In light of the social, economic, and environmental realities, the challenge is conceptually to identify the development deficits in each situation and to determine which governance targets will be most pertinent to achieve increased development.

With the adoption of Sustainable Development Goal 16 in September 2015, the overall objective to "promote peaceful and inclusive societies for sustain- able development, provide access to justice for all, and build effective, accountable, and inclusive institutions at all levels" now incorporates various aspects of "good governance". The "good governance" agenda's targets include things like "promote the rule of law at the national and international levels and ensure equal access to justice for all", "substantially reduce corruption and bribery in all its forms", "develop effective, accountable, and transparent institutions at all levels," "ensure responsive, inclusive, participatory, and representative decision making at all levels," and "ensure public access to information". The Sustainable Development Goals significantly surpass the Millennium Development Goals by expressly include aspects of "good governance," even if the formulations are still wide and subject to qualification by national law. However, in the long run, this breadth might also encourage, in the coming years, international agreement and build alliances among various countries with various priorities, capacities, and experiences, with novel opportunities to link various aspects of good governance in goal-framing exercises that can unite nations with various interests.

Lastly, "good governance" is a topic that affects nonstate actors as well as governments and international organisations. Accountability procedures that contain good governance standards may also be adequately applied to them given the expansion of partnerships, action networks, and transnational governance structures engaged in sustainable development. The Sustainable Development Goals and the governance mechanisms supporting them within the UN may

encourage the application of the UN's voluntary accountability framework to any partnership or transnational governance arrangement involved in sustainable development, as Bernstein suggests. Such a focus is consistent with research on the value of sound internal governance for the legitimacy and efficacy of public-private partnerships.

Optimal Governance

When it comes to successful governance, the issue of whether governments can really agree on a set of metrics to gauge how well governance systems can handle today's complex sustainability concerns emerges. It is especially crucial to build the institutional foundation for long-term decision making and for the coordinated implementation of sustainable development policies in the context of global environmental change and unsustainable growth paths. The need to strengthen the capacities of existing institutions at the local, subnational, national, or regional levels, as well as of authoritative governance arrangements that may function in nontraditional governance spaces like partnerships or transnational governance mechanisms or initiatives, does not require governments to come to an agreement on a specific institutional basis for long-term decision making and policy integration.

The process that led to the Sustainable Development Goals tended to either define effective governance as "means of implementation" or to focus on issue-specific discussions on effective institutions. There hasn't been much attention paid to developing the skills necessary for integrated, long-term policymaking to achieve the Sustainable Development Goals. Also, it was difficult to establish political consensus on methods of execution; in contrast, objectives that focused on long-term policy outlooks and national goal setting proved to be easier to get political support for. However, most of the existing measures of good governance are restricted to certain topics, such water governance. Wider integration may take the form of proxy measures linked to governance decisions, such as the under-age-5 mortality rate, surveys on public perceptions of effective governance, and expanded and more systemic stress testing of national institutions.

Effective governance has really been included into a variety of goal-specific issues in the Sustainable Development Goals. Nine of the 17 Sustainable Development Goals contain targets defining goals for bettering resource management or social issues. Goal 4 on education, for instance, says to "ensure that by 2030, all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity and of culture's contribution to sustainable development". The requirements for achieving goal 6 on water and sanitation include "implementing integrated water resources management at all levels"and "the participation of local communities in improving water and sanitation manage- ment"for incorporating local communities into sanitation planning.

These elements provide opportunities for more effective governance, albeit execution will ultimately decide their influence. Furthermore, the goal related to governance, Goal 16, specifically addresses the efficacy of governance, as seen in its calls to "develop effective, accountable and transparent institutions at all levels" and to "strengthen relevant national institutions, including through international cooperation, for building capacity at all levels, in particular in developing countries, to prevent violence and combat terrorism and crime".

In conclusion, strong skills for long-term planning, which go beyond methods of execution, are a key component of good governance. Associated objectives and benchmarks for good governance are often included in the SDGs that are focused on particular problems. Among the specific requirements for good governance that should be emphasised are the creation of national sustainable development plans, statistics and other relevant monitoring, data and analytic capabilities, and human resources for governance and policy-making competence.

CHAPTER 9

EQUITABLE LEADERSHIP

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Lastly, debates of governance and equality issues must be intertwined. The distribution of results is significantly influenced by governance, hence finding equal or fair solutions to public policy issues appears vital. In the broad framework of the 2030 Agenda for Sustainable Development, the idea of "no one left behind" stands for the need of fair governance.

The integration of equitable governance concerns into the governance objectives of international organisations is possible thanks to a variety of indicators. One of the most well-known measures of how wealth or income is distributed across a nation or community is the Gini index. The index, which scales wealth distribution with a value of zero signifying perfect wealth equality for all citizens and a value of one signifying the greatest inequality, allows for measurement over time and can be applied to a variety of assets. Despite the possibility that targets for Gini index results could be included in governance objectives in international institutions, domestic income distribution is still deeply entangled in value disparities between nations, making it challenging to operationalize equality through quantitative agreements on lowering the Gini coefficient. Also, due to the interaction between problems of wealth inequality and minority rights, women's rights, and other unique national contexts, income inequality and access to decision-making authority differ greatly between nations.

As a consequence, some have claimed that the main method for incorporating equality issues into global governance objectives should have been to use metrics that can be broken down into several socioeconomic groups. These degrees of disaggregation are rare in current indices of effective or excellent governance. This may provide an opportunity to integrate fairness in governance procedures and results to dashboards of different metrics, in addition to good governance and effective governance. Another option is for states to come to an agreement on qualitative statements that say it is undesirable to have large levels of domestic inequality as a critical component of global progress towards inclusive sustainable development, but leave the precise goal values unspecified. Moreover, equitable results may be operationalized as absolute goals, such as the agreement on particular protection granted to the most vulnerable citizens of a community or a nation. Examples from the Millennium Development Goals that stipulate a normative statement about minimum thresholds in national wealth or income distribution that are not acceptable and thus call for urgent political action include the global agreement on eradicating poverty and reducing hunger and malnutrition. Governments discussed, among other things, gender equality, empowering marginalised groups, social protection system strengthening, encouraging higher income growth among the poorest segments of societies, and disparities in opportunities and economic chances, especially for women and girls, during the negotiations for the Sustainable Development Goals.

There are presently many goals and objectives in the Sustainable Development Goals that deal with the distributive effects of governance. Goal 5, "Achieve gender equality and empower all women and girls," calls for women to be given equal opportunities and rights to economic and technological resources, and Goal 10, "Reduce inequality within and among countries," includes targets that concentrate on reducing high levels of inequality in the distribution of wealth or income within and among countries. Nevertheless, suitable indicators for each aim still need to be developed, and progress in the fusion of several goals and targets for equality, such as access to education for women in underprivileged populations, should be closely monitored. Therefore, the question in the upcoming period of implementing the Sustainable Development Goals is how and whether these objectives can be translated into particular institutional settings that call for governments to develop policies that lessen extreme levels of inequality and that advance the eradication of poverty. The degree to which Goal 10's wide pledge to decrease inequality "across countries" will be realised in the next ten years is also still up for debate.

Whether to See Governance as a Separate or Integrated Goal

In order to weigh the benefits and drawbacks of pursuing governance as a stand-alone "governance objective" in international institutions and agreements or incorporating it into issue-specific goals, it is helpful to start with an understanding of these three aspects of governance. Because of various political alignments, the accessibility of indicators, and the potential for mobilisation, the many dimensions of governance will present themselves in unique ways. So, this section considers the advantages and disadvantages of two governance objectives that are both included in the 2030 Agenda for Sustainable Development: stand-alone governance goals and cross-cutting integration of governance concerns in issue-specific goals. The Sustainable Development Goals have two separate sections on governance, however both of them leave important aspects of governance vague. The phrase "promote peaceful and inclusive societies for sustainable development, ensure access to justice for all, and build effective, accountable, and inclusive institutions at all levels" emphasises some general characteristics of good governance while largely ignoring equitable and effective governance. In order to "guarantee equitable access to justice for everyone," section 16.3 asks for the development of the rule of law, while section 16.6 instructs states to "Build effective, accountable, and transparent institutions at all lev- els." Sections 16.9, "By 2030, establish legal identification for everyone, including birth registration," and 16.b, "Promote and implement non-discriminatory laws and policies for sustainable development," place more emphasis on removing obstacles to equality than on actively promoting it. There are no comparable sections for concentrating on the coherence of policy-making capabilities or equitable governance features under the emphasis on good governance characteristics like eliminating corruption, enhancing the rule of law, and boosting transparency, accountability, and participation.

Notwithstanding significant measurement difficulties, Sustainable Development Goal 17 currently has three objectives for "Policy and institutional coherence". While there are a variety of substitutes for things like effective governance capacity that may meet certain objectives, there are currently no generally recognised measurements of state administrative and legal capabilities. Second, the definition of capability may vary between nations and political systems. Governance evaluation indicators might have provided a way to include excellent governance into a stand-alone objective. For instance, Mongolia used this method while launching its initiative for a Millennium Development Goal on democratic governance, which began with an

evaluation process in which the effectiveness of its democ- racy was publicly reviewed. Thirdly, it's possible that complete independent objectives for governance may minimise the equality components of governance results, particularly when it comes to the creation of indicators.

The integration of governance-related features into issue-specific objectives, including those on water and sanitation, health and wellbeing, or gender equality, has been a parallel strategy in the 2030 Agenda for Sustainable Development. This strategy poses several difficulties. One issue is that such an approach could encourage a concentration on the components of governance that are easier or most politically acceptable while ignoring the more challenging or contentious aspects of governance, such as those connected to long-term environmental sustainability and fairness of outcomes. This is made more challenging by the fact that such integration is more developed in certain problem areas than others. In the 2030 Agenda for Sustain- able Development, where good governance aspects are highlighted more prominently in some areas—such as water and sanitation—than in others—such as poverty eradication, access to energy, or health—it is clear how difficult it is to incorporate all three dimensions of governance. Effective governance may potentially overlap with Goal 17's "means of implementation" and "global partnership for sustainable development," which are both related to effective governance. In order to achieve political feasibility, these common phrases are used in UN procedures, but they have a history of confusing national planners and policymakers. Also, a significant improvement in the ability of nations to measure, aggregate, report, and analyse the outcomes is necessary in order to evaluate progress on effective governance. By developing task-specific ability, these elements of successful governance might be included into the other internationally agreed upon aims. Qualitative indicators may not always be taken into account when addressing a given problem. Also, it is crucial to make a distinction between results, or the calibre of data accessible for decision-making, and effective procedures, which allow the monitoring process and data collecting by creating capacity or funding the employees required for this activity.

Aspects of equitable governance have also been included into SDGs that focus on particular problems. For instance, gender disaggregation of indicators has received a lot of attention and should be a central part of a governance strategy across all goals and objectives, not only Goal 5. There may be constructive integration in certain regions where there are already symptoms of inequality. The need to integrate the indicators for Goal 10's aims with those for Goal 17 is an apparent example. Aid, commerce, financial flows, taxes, and other such mechanisms are included in both Goals, but only if the aims in Goal 10—which clearly target the nations and areas of society with the greatest needs—are taken seriously can Goal 17 be accomplished in an equitable manner. As the aforementioned example indicates, fair governance is likely to have the biggest disparity between objectives that pay attention to governance problems and those that pay inadequate attention.

In order to operationalize sustainable development, "governance objectives" must be included in international organisations and agreements. The Sustainable Development Goals include objectives that focus on improving governance, strengthening national and local governance capacities, and the distributive outcomes of governance, such as lowering extreme levels of inequality and advancing the interests of the poor. These objectives and targets are all included in the Sustainable Development Goals. The Objectives are considered quite differently while having components from all three dimensions. Effective and equitable governance are addressed

in many Sustainable Development Goals as well as Goal 10, although "excellent" governance components are primarily limited to Goal 16 and issue-specific Goals.

The ambiguous link between excellent, effective, and equitable governance highlights the need of tracking indicators associated with these categories at different levels of aggregation, in relation to both specific objectives and national or even local settings. In this regard, it is clear that governance must be acknowledged as an important subject of review in and of itself in order to foster shared experiences regarding the relationships and requirements of the three aspects of governance and inputs into the capacity and technical needs for improving governance for sustainable development. By encouraging the scientific study of how various governance arrangements, elements, and combinations of governance capacities, qualities, and techniques support advancement on sustainable development, such analyses could facilitate such learning and be included as regular components of the Global Sustainable Development Report. As part of the follow-up on the Sustainable Development Goals, governance must also be a regular agenda item at the High-Level Political Forum on Sustainable Development and other forums. The Sustainable Development Goals' motto of "leaving no one behind" calls for excellent and efficient governance in achieving each objective. In conclusion, the science-policy interface created to promote the accomplishment of the Sustainable Development Goals should incorporate policy sciences and governance studies in their own right as an essential component.

Monitoring the Sustainable Development Goals' Progress

The Sustainable Development Goals' momentum may make it easier for disparate measuring attempts to establish a single voice. Measuring has emerged as one of the essential components of implementation strategies, with the UN Statistics Division and Commission playing crucial roles. Nonetheless, the United Nations and many states have already started to establish sustainable development indicator systems: Under the auspices of the UN Commission on Sustainable Development, three editions of comprehensive methodological guidance were prepared and made available to member states earlier, but no significant progress was made in the creation or mainstreaming of these indicators in decision-making. Not just due to technical issues with the indicators proposed by these initiatives or the persistent issues with data accessibility, a breakthrough was missed. Without enough political backing and public interest, the effort was constrained to the technical and statistical level and stopped short of addressing the different governance-related issues of how the new metrics will alter policies, policy implementation, and accountability regimes. Of course, there are still technical and statistical challenges that need to be resolved, but until the work on measurement is also seen through the more comprehensive lens of governance and political economics, a breakthrough cannot be anticipated. In order to identify, comprehend, and resolve sustainability-related issues, observation, measurement, and evaluation are crucial components of strategic management and governance. Measurement is important because it contributes information to decision-making, whether it is related to comprehending the causes of past issues, managing in the present, or planning for and investigating the state of the planet. This information is relevant to everyone, from individuals and society at large to businesses, governments, civil society, and multilateral organisations. Since the late 1980s, there has been recognition of the value of measurement and, in particular, the role that indicators play in sustainable development, as underlined in Agenda 21's. They were also emphasised in the report of the 2012 UN Conference on Sustainable Development, where indicators were acknowledged as a crucial component of follow-up and a

cross-cutting concern. In the broader sustainability context, measurement is no longer just about public monitoring and reporting; it also involves the private sector through corporate reporting and civil society organisations tracking and publishing indicators and data gathered by dispersed networks of lone citizen observers. This chapter makes the case that applying the sustainability context to measurement entailed more than just acknowledging the role of measurement in agenda setting, implementation, and reflexive evaluation. It also involved situating measurement's dilemma in a policy and political context that went beyond its primarily technical nature.

In fact, measurement may be seen as a technological activity that focuses on acquiring and presenting data via the use of several monitoring, statistical analysis, and remote sensing techniques. Associating measurement with the larger context of sustainability, however, brought up issues about its fundamental subject—what is being measured, why, and by whom—in addition to its techniques and equipment. Beyond the technical level, the sustainability discourse's use of measurement has evolved into a platform for challenging the norms, values, and hierarchies that underlie notions of what may be measured. This suggests that indicators might serve as a foundation for how society conceptualises sustainability and well-being in addition to assessing the state and development of the world in light of values crucial for human well-being. Building transformation and transition agendas is important in many of the policy areas where sustainability, and by extension, the Sustainable Development Goals, play a role. This is necessary in light of the mounting dangers associated with business-as-usual approaches. The development of transition paths may be given a more solid foundation by using targets and indicators based on politically acceptable objectives. As shown by numerous sample attempts to create indicators for the Sustainable Development Goals; Sustainable Development Solutions Net- werk 2015), the work might draw on objectives and indicators currently in use. At the same time, as noted by the majority of global sustainability-related evaluations, it is not tenable to depend only on the measuring methods and institutions that supported the growth patterns that led to today's obviously unsustainable trends.

The need for a revolution in the creation and use of socioeconomic and environmental data in the reorientation of the purpose and practise of development aligns with calls for better execution and accountability of globally agreed objectives a commission known as Stiglitz-Sen-Fitoussi. Global measurement reform and the formulation and accomplishment of global objectives, exemplified at the highest level by the Sustainable Development Goals, share synergies and share common interests. We further contend and endorse prior proposals that, in order to comprehend and benefit from these synergies, it is important to view sustainability-related measurement and the use of measuring tools as fundamental elements of governance. We suggest using a broader political economy lens to understand how measurement interacts with the interests and decisions of important actors and institutions as they consider the ramifications of building implementation agendas around the Sustainable Development Goals, moving beyond statistical, communication, and management dimensions. It will be crucial to check that the indicators used when setting up measurement systems are pertinent for various actor groups that are willing to share responsibility for carrying out the Sustainable Development Goals. The general intentions of sustainability are de-mystified and the general intentions of the Sustainable Development Goals become concrete, allowing actors responsible for delivering solutions to act on them and be held accountable. This is done by agreeing on a set of universally relevant targets

and related indicators and putting measurement systems in place as part of subsequent implementation at subglobal levels. Therein lies a problem and a chance: How can the measurement-reform agenda, which is as inclusive and all-encompassing as the global objectives, be reformulated to realise its transformational potential in the sustainable transition? The Sustainable Development Goals must be implemented effectively in order to gain momentum and help make sustainability the new standard. This requires alignment and convergence with other measurement and indicator systems at the national, ecosystem, company, supply-chain, and product levels. There are many ways that measurement decisions interact with the priorities and preferences of important players and organisations, which has an impact on whether or not the Sustainable Development Goals will be advanced. Sound implementation decisions will depend on ensuring that the indicators are pertinent, understood by various actor groups, and that they assist those groups in taking ownership of implementing the Sustainable Development Goals because they highlight their individual contributions to or detriments from progress. As a result, the 2030 Agenda for Sustainable Development must include monitoring of the Sustainable Development Goals as a fundamental and practical component.

If an integrated conceptual framework for the Sustainable Development Goals and underlying objectives is created, it must clearly represent the interlinkages between the various goals and be connected to national and subnational monitoring and accounting systems. This would also present an opportunity to redefine national development metrics, which continue to place too much emphasis on measuring economic growth, and place a larger emphasis on environmental sustainability and social metrics and dimensions. This would align economic monitoring, accounting, and reporting frameworks with sustainable development reporting.

A Governance Perspective on Changing Measuring Systems

Thus, measurement is seen as a crucial component of governance that enables individuals to qualitatively and quantitatively describe, map, and navigate the evolution of intricate socio-ecological systems through time and at all scales. While the most frequent measurement concern in the sustainable development discourse relates to the choice of indicators to employ, a more sophisticated analysis must also acknowledge other dimensions whose role and function need to be taken into account if measurement is to be compared to its potential for advancing sustainability. Measuring systems often function as important and deeply ingrained components of governance, making them conservative and resistant to change. The use of official data serves as the best example of this. Since the Second World War, statistical monitoring, measurement, and reporting have maintained a sizable degree of consistency throughout time and place to aid long-term study. There has been a lot of interest in measuring globalisation as the global economy has grown, particularly in how the system of national accounts might adjust to the new economic realities. Although it isn't often acknowledged as such, the development of metrics and measurement systems like gross domestic product and gross national product actively contributed to today's understanding of national wealth and development rather than serving as passive instruments in the spread of globalisation. The assessment of debt, deficit, balance of payments, export-import data, and associated metrics like the credit rating of national economies were and continue to be important factors in determining a country's access to capital markets, technology, and other areas of production and consumption. They contributed to the notion that uniformity and comparability are necessary for establishing a country's fundamental economic condition and judging its creditworthiness or assistance eligibility. Importantly, this also helped

to disseminate and solidify the value structures and mentalities that have supported the remarkable expansion of the material economy over the last several decades. Some statistical metrics contribute to moves towards more people-focused development beyond their purely economic effects. In 1990, the United Nations Development Programme created the Human Development Index as a way to assess nations' performance in terms of health, education, and per capita income while also urging governments to take into account metrics other than GDP. These days, many nations use this metric to gauge their performance and growth relative to other nations as part of their national monitoring system.

The development of scientifically credible measurements, such as those of ozone layer depletion or the balance of greenhouse gases in the atmosphere, was crucial for problem diagnosis in the environmental dimension, parallel to the development of common measurements in the economic and social spheres. Environmental metrics have become crucial to the operation of many multilateral agreements, even though they are not as well-known as economic indicators. This is true for data on greenhouse gas emissions related to the measurement, verification, and reporting regimes of agreements related to climate change as well as the System of Environmental-Economic Accounting as part of national statistics and natural capital accounting.

Nonetheless, current measuring techniques may still be used as a tool in governance to maintain, for the time being, the appearance of stability in the status quo, primarily by ignoring the debt and deficits in social and natural capital brought on by the predominate style of growth. Given the scientific evidence that the present state and trajectory of the earth system have entered unknown territory with no precedent in the planet's history, this is a dangerous venture. Recent analyses have demonstrated that the full costs of inaction on environmental issues are extremely high, and that the earth system already operates in an unsafe operating environment as a result of the breaching of some important planetary boundaries and the failure to ensure a minimum social floor for a sizeable portion of humanity. Instead, the no-analogue condition of the earth system necessitates the use of no-analogue response mechanisms, such as cutting-edge forms of governance. Measurement and the monitoring, reporting, and verification functions that go along with it are particularly interesting due to their high-leverage, transformative potential as well as the potential for synergies that have developed over the past few decades among initiatives for measurement-reform at various scales and among various actor groups. From a political perspective, the Sustainable Development Goals hold out the possibility of offering a strongly mandated platform for various measurement and reporting efforts to speak with a single voice, to have more reliable accountability mechanisms, and to shift the focus of governance towards the restructuring required to implement the goals and to achieve a wider transformation—what implementing the goals would inevitably entail.

We contend that in addition to the normal technical considerations, the case also has to be made for the governance components of measurement reform in order to take advantage of the necessity for reporting on Sustainable Development Goals and to promote the larger goal of global measurement reform. We further contend that this necessitates taking into account the conceptual approach, important players, and their interests in addition to the mechanisms, institutions, and measurement tools all at once. Even though they are listed last in this list, measuring efforts often centre on them, to the exclusion of the other dimensions. Here, we provide a summary of these crucial yet ignored aspects of governance.

Concepts

This dimension covers both the importance of measurement in decision-making as well as the worldviews and mindsets used to define what is significant for society to measure. The creation of theoretical frameworks that represent underlying worldviews is often a component of the intellectual underpinnings for measurement. Generally speaking, progress measurement, well-being, and sustainable development are good places to start. Apart from the understanding that sustainability must include both socioeconomic and environmental dimensions of development and be universally applicable, no formal framework was utilised as a starting point in the official process for the Sustainable Development Goals. The incomplete depiction of the environment in the Millennium Development Goals was a result of a similar absence of a framework. Although the categories of SDGs that were identified can be viewed as a thematic framework that resulted from a larger societal consultation, the framework lacks a structure and hierarchy that would aid in identifying priorities and interlinkages that are crucial from the perspective of implementation.

At the conceptual level, it will be crucial to understand how the indicators of growth's costs and hazards connect to the assessment of the conventional "economic growth" elements such per capita income, consumption, and output as well as the other macroeconomic performance measures. There is relatively little knowledge of the potential trade-offs this may involve, even if the idea that the Sustainable Development Goals must provide a way to navigate human progress in a safe and fair zone has received considerable recognition. In order to achieve the Sustainable Development Goals, goals, and indicators, conceptual ambiguities connected to their implementation must be resolved at the level of indicators and transformed into convincing stories about the steps being taken in that direction. What is implemented and how may be greatly influenced by the prevalent narratives, who produces them, and how they connect to indicators.

Actors

The quantity and variety of participants with interests in the process and its outcomes expand well beyond what is strictly speaking the purview of technical organisations. This includes those whose interests—political, economic, or otherwise—are impacted by the metrics used and the scope of the Sustainable Development Goals. The tendency of measurement-reform initiatives to involve a wide range of actors in their work and the relative ease with which involvement can be justified and realised are the best examples of this; all those whose performance is assessed can recognise how the measurement approach used can affect the conclusions of such assessments. These initiatives aim to create "sustainable development indicators" at various levels. Actors and interests may also be in favour of sustaining the current quo in terms of measurement. For instance, consider how much the financial markets rely on macroeconomic statistics to support their evaluations by quasi-oligopolistic credit rating organisations. These are only a few instances, but they show the enormous institutional commitment to both creating and utilising information, as well as the places where concerns about flawed assumptions and approaches point to the need for reform.

Institutions and Mechanisms

It takes procedures with a mandate approved by relevant players and recognised as legitimate by society to alter typically conservative assessment systems. This can take a variety of shapes, from well-established statistical agency review mechanisms—such as the UN Statistical

Commission's recent adoption of a revised framework for environmental statistics and the attempt to create more integrated social, environmental, and economic accounts—to grassroots initiatives with a goal of creating crosscutting indicator systems at the local, governmental, or other levels. The "socialisation" or opening up of the field of indicator development to actors and institutions outside of statistical agencies, which began on a larger scale in the early 1990s, encouraged the creation of numerous new initiatives with varying degrees of formalisation and stability and frequently significant methodological variances. More modern systems, including those connected to the environment, may require fewer structured evaluations and, as a result, grow with more flexibility. This contrasts with more thoroughly established indicator systems, such the economic and trade-related components of national accounts. As discussed by the UN Secretary-Independent General's Expert Advisory Group on a Data Revolution for Sustainable Development, moving towards a broader paradigm of measurement could raise concerns about the sufficiency of current mechanisms, as well as the mandate and capability of leading institutions and their interactions with partners and audiences.

Instruments

The data, indicators, and associated reporting methods that are utilised to monitor real progress are referred to as the instruments of measurement in this context. Finding, altering, or correcting them is often a crucial goal and the most obvious one of measuring activities. Data collecting mechanisms, without which indicators cannot be operationalized, might also be included in a more comprehensive view of the instruments of measurement. Whilst alternatives are expanding because to the expansion of information technology and crowdsourcing through social networks, building and sustaining such capacity may be time-consuming and costly. The same is true for reporting systems, where the use of dynamically developing, interactive tools is progressively replacing or supplementing the usage of static, paper-based goods. These technologies may improve transparency and provide a more equal playing field when it comes to the generation, analysis, and provision of information, with consequences for entrenched interests and power structures. They do this via real-time data access and tailored searches and presenta- tions. A recent example of an information system that aims to contribute to the synchronisation of ontologies and facilitate multiscale assessments in addition to enhancing access to data is the UN Environment Programme's UNEPLive platform.

A governance perspective on altering measuring systems must take into account the demand side in addition to supply-side factors. Measurement applicationsmay and do arise around frequently updated and accessible statistics, such as carbon emissions, unemployment rates, the most recent GDP, or daily changes in the stock market. The use of indicator in society may be widespread and has an impact on all actors, industries, and aspects of the environment and development on some level. Several players in both the public and commercial sectors base their plans and operations on current and future indicators, which leads to a dependence on and interest in such indicators' regular availability. Updating the measures might put established decision-making processes in doubt. This emphasises how difficult altering measurements could be, but also how powerful they are at starting cascade impacts once change does occur. The fact that the sustainability measurement agendas of the past often had limited or at the very least ambiguous effects may be explained by the sheer number of participants, the variety of interests, the high cost, and the potentially far-reaching ramifications for existing practises. By incorporating the assessment of environmental performance into the mainstream of national accounts rather than

developing a set of parallel indicators, China's ambitious endeavour to build and implement a "green GDP" promises to be innovative. The choice to eventually if temporarily—give up the project shows how the intellectual and technological complexity of the notion was not well appreciated. But more importantly, it also demonstrates the potential for political complexity, as a GDP adjusted for environmental costs might have called into question the veracity of economic performance data at the national and subnational levels, affecting the interests of both domestic and foreign actors. Take, for example, the unease that markets and policymakers felt in response to news of slower-than-anticipated growth rates in China or elsewhere. Also, it would have shown how little was known about how to include environmental expenditures in national accounting.

It would be obvious that a comprehensive reform of measuring systems as part of the achievement of the Sustainable Development Goals would be a promising—yet complex—process. The main problem isn't just changing the methods for measuring success; it's about widening and transparently discussing what progress is, who it benefits, and what outcomes it produces. The measurement of the Sustainable Development Goals would amount to little more than a technical exercise in progress reporting without taking into account both the supply and demand sides of measurement as well as understanding how the shift from previous and present theories, practises, and tools can happen. It is helpful to draw on the lessons learnt from best-practice principles for sustainable development measurement and evaluation in order to fulfil its transformational potential. They emphasise the need of long-term thinking, the visions that ought to guide the Sustainable Development Goals, and the need for transitional routes with intermediate objectives. In order to develop the conceptual frameworks and thematic emphasis of measurement systems around agreed societal values and to hence establish and reinforce ownership, they ask for stakeholder input. In line with this, it is important to consider the wide scope that underpins the sustainable development approach while also acknowledging the systemic links between the many players and scales that are important in shaping higher-level and long-term results. Moreover, as a fundamental component of strategy and policy, they need a learning-adapting approach. The development of multilayered, complicated plans for the objectives' implementation would be closely monitored through indicators for the Sustainable Development Goals and their evaluation, which would provide both short- and long-term input.

CHAPTER 10

HISTORICAL DATA ON MONITORING GLOBAL GOALS' PROGRESS

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In this part, we apply the four-dimensional framework to current international objectives, including the Millennium Development Goals and multilateral environmental accords. Understanding the traits and development of progress measuring systems is made easier by this approach. The results of the retrospective study show that although the fundamental idea behind the measurement framework has not changed over time, the spectrum of players participating has expanded, and institutional interaction has intensified and grown more coordinated. Alternative measuring techniques, however, have coexisted with the dominant economic and sociopolitical paradigms rather than being supplanted by them despite the rising momentum.

Regarding the conceptual approach, during the last thirty years, a number of frameworks for tracking advancement on problems related to sustainable development have surfaced. The pressure-state-response model, which has numerous variations including the activity-impact-response model created by the UN Statistical Division, the driving force-state-response and driving force-pressure-state-impact-response models, is a pioneering and widely used framework. The World Bank established the capital-based approach, which takes into consideration four fundamental categories of resources as economic, natural, human, and social capital. It is based on accounting for the upkeep of a country's national wealth. Based on this strategy, it has been proposed to combine capital-based and well-being methods, connecting the four distinct categories of capital to ultimate aims, intermediate ends, intermediate means, and ultimate means. Indicator sets organised around theme categories, such as the sustainable development indicators established via a global process managed by the previous UN Commission on Sustainable Development, are among other important conceptual approaches. Most of the indicators for the Millennium Development Goals are also based on the set from the UN Commission on Sustainable Development as well as specific indicators that track fulfilment of promises made in different international agreements for the environment and development. The Organisation for Economic Co-operation and Developmentand UNEP have more recently produced green economic and green growth indicators that build on past work and use a theme framework. These models are still in use and continue to cohabit in a variety of evaluations, reports on the MDGs, and outlooks.

In the past, international organisations gathered, evaluated, compiled, and then examined data provided by national statistics agencies and ministries as part of a top-down strategy to measuring global objectives. For instance, the Vienna Protocol, the UN Framework Convention on Climate Change, and the Convention on Biological Diversity all require measurements of greenhouse gas emissions and ozone-depleting compounds. The Strategic Plan for Biodiversity 2011-2020 of the Convention on Biological Diversity comprises a detailed list of objectives, targets, and indicators, as well as a widening of the measuring system to take into account

ecological values to society. International organisations like UNESCO and WHO also keep tabs on the development of their aims in the fields of education and health. The top-down, silo strategy that has often been used in data gathering and reporting initiatives makes it difficult to identify and analyse how diverse socioeconomic and environmental objectives are interconnected.

At the international level, the monitoring and reporting of the Millennium Development Goals stood out as a larger undertaking with the potential to integrate the monitoring and reporting of progress on global objectives into a standard reporting format and tools that can be used in many nations. A larger range of players needed to be involved at the global and subglobal scales in order to assure consistency and reliability of data collecting for the Millennium Development Goals. In underdeveloped nations where the Millennium Development Goals were applicable, nonprofit groups and private organisations were also active.

Institutions and Mechanisms

Progress reporting on the MDGs entailed not just reporting the status of indicators but also linking them to objectives and targets, in contrast to other global measuring and reporting systems like the Global Development Indicators. Several sources provided the data for the worldwide reporting on these objectives, and the ensuing discrepancies posed a substantial reporting and analytical limitation. The Interagency and Expert Group on Indicators for Millennium Development Goals was established, bringing together the UN Secretariat and other UN agencies, international, regional, and sub regional organisations, government agencies, national statistical bodies, and development institutions, to coordinate the process of data collection, analysis, and reporting among the various actors.

The goal was to utilise measuring and reporting data to aid policy makers in prioritising concerns in plans and strategies, evaluating whether major issues were improving or becoming worse, and highlighting trouble areas that need immediate attention. For instance, a lot of people think that the MDG indicators are crucial for defining, prioritising, and incorporating development objectives into national planning procedures. Also, the measures often joined established economic indicators as part of yearly monitoring operations. However, the reporting on the Millennium Development Goals fell short as a mechanism for overall progress reporting due to the focus on thematic priorities of the Millennium Development Goals rather than a synthetic assessment and significant gaps in the issues covered.

Outside the Millennium Development Goals, initiatives to collect, analyse, and publish social and environmental statistics have expanded and become stronger over the last 20 years as a consequence of the larger measurement-reform movement. In certain instances, the capability for monitoring also steadily increased. More interpretative analysis was offered by global integrated assessment reports than by indicator reports, such as UNEP's Global Environment Outlook and UNDP's regular Human Development Reports. Nonetheless, despite their "integrated" nature, they fell short of a global sustainable development report due to their major emphasis on the environment in the case of the Global Environment Outlook and the human component in the case of the Human Development Reports.

Traditional statistics and remote sensing organisations and methodology have been used to gather data for independent global objectives and indicators related to the Millennium Development Goals. Constraints on personnel and financial resources, methodological

disparities, a lack of data access, and inconsistent data quality yet continue to exist. Decentralized, citizen-driven monitoring and reporting have proliferated and generated growing volumes of data, in part because of advancements in information technology. The importance of Bottom-up tactics for gathering statistical indicators has grown significantly since the turn of the new century, even if the outcomes of such efforts and the increasing availability of "big data" have not yet been systematically exploited in reporting on global objectives. The Independent Expert Advisory Group on a Data Revolution for Sustainable Development established by the UN Secretary-General is a recent high-level initiative to highlight the significance of data problems as a strategic priority.

Even if the scope, reliability, and usefulness of these methodologies vary from initiative to initiative, making them more coherent might greatly boost their value and use in the future. Governments at various levels have established or enlarged sustainable development indicator sets on the output side. Several regional governments and municipalities have been creating their own indicators and reporting materials because they understand how important it is to take local conditions into account. Moreover, a large number of nongovernmental groups have started to create their own indicator sets, often for particular problem areas and use composite indicators.

These bottom-up strategies offer a lot of promise to enhance data gathering and monitoring for goals of global development, but these possibilities have not yet been completely realised. Such programmes are intended to be brought together, and a platform for learning and information exchange is provided through organisations like the Community Indicators Consortium in North America and the OECD's Wikiprogress. To address the heterogeneous character of these projects and put them in a common analytical, institutional, and maybe political framework so they can be used on a larger global scale, further work will be required.

Monitoring the Sustainable Development Goals' Progress

The indicators and reporting procedures related to the Millennium Development Goals are one of the most cited models for gauging progress towards international objectives. There are significant variations between these objectives and the Sustainable Development Goals, even if the experience with indicators on these goals is pertinent. The Sustainable Development Goals' larger scope and universal application to all nations account for some of the variations. The Sustainable Development Goals call for juggling a larger variety of very complicated and interconnected challenges at once. Long stretches of stability may be broken up by brief bursts of extreme change in this ongoing process of exploration, gradual modification, revision, and reordering. In a situation with this much uncertainty, it is almost hard to design optimum policies. Instead, inclusive, learning-by-doing procedures at the many relevant locations will be necessary, along with rigorous monitoring and evaluation of the impacts of policies and the capacity to make important decisions and changes along with the trajectories leading to long-term objectives. Instruments that are crucial to these activities are indicators.

With a more advanced policy agenda, measurement and its significance in diverse international policy instruments also have other significant contextual distinctions. Discourses about alternatives to some of the key performance measuring indicators, like the GDP, have acquired considerable momentum over the last ten years, though not yet universal acceptance, at the most general and worldwide levels. This was evident during the UN Conference on Sustainable Development in 2012, when many observers anticipated that new measures for gauging social

development or well-being would gain wider acceptance in the years to come. Moreover, measuring has become a crucial component of various international talks on environmental development, such as the UN Framework Convention on Climate Change, which includes measurement, reporting, and verification. At a more fundamental level, the focus on impact measurement by both public and private organisations, such as those dealing with sustainability-related standards that more directly affect organisational, supply-chain, or ecosystem level, demonstrates that measurement is a significant and probably universally relevant lever with the potential to affect policy and practise. As a consequence of mechanisms like the Global Reporting Initiative, indicators are being used more often in business reports. While such measurement initiatives may have an impact on an organization's sustainability performance, the Sustainable Development Goals Measure What Matters 2015 suggests that the real opportunity for change may lie in the strategic alignment of the various indicator systems around important issue priorities. Because they must succinctly and concretely express the norms, interests, and aspirations of various actors and because they can serve as a link between the normative domain and the theatre of policy implementation, indicators of Sustainable Development Goals may be particularly effective tools for policy alignment. We contend that measuring the Sustainable Development Goals via the four aspects we connected to a governance lens might aid in the advancement of their implementation.

In order to achieve the Sustainable Development Goals, one must be able to prioritise tasks while maintaining awareness of crucial components of intricate socio-ecological systems. The framework for the goals that has been agreed upon may also be used as a springboard for the selection of objectives and metrics that, taken together, will make the Sustainable Development Goals a globally relevant agenda. The Sustainable Development Goals, however, were established through a political process without the use of a higher-level formal conceptual framework that would have represented the negotiating parties' shared understanding of how the issues should be organised, interconnected, and measured for sustainable development. As indicators must be developed from objectives, sustainability metrics may also lack a conceptual foundation. Building on the Secretary-Synthesis General's Report and the report of the UN Secretary-Independent General's Expert Advisory Group, which offered only limited guidance with regard to the conceptual framework for measurement, much of the focus on measurement has been on making sure there is adequate monitoring, data collection, and reporting. The Sustainable Development Solutions Network's work was centred on 10 top issues in other international initiatives. The UN Statistics Division's initiative, which employed a thematic structure akin to the Sustainable Development Solutions Network, was to discover indicators related to the objectives.

A theme framework by itself does not clearly distinguish between the costs and benefits of development, even while establishing indicators in a thematic framework around the objectives themselves is crucial for monitoring progress towards targets: While it has all of the essential components, it does not provide the indicators as a framework that demonstrates the connections between social, economic, and ecological capital. Le Blanc noted that preliminary work has begun on creating or reconstructing the Sustainable Development Goals as a system of interconnected goals, targets, and indicators at the international level. Other goal-target-indicator systems have also been developed around conceptual frameworks that distinguish between ultimate means and ends. Although these show how Sustainable Development Goals and

indicators can be developed or organised around conceptual frameworks that are explicit about the causal connections between development's drivers and results, such frameworks might need to be explicitly accepted in monitoring and analysis of SDGs in order to have an impact on implementation.

In order to increase accountability at the national and subnational levels, the framework for monitoring would need to be connected with important policy aims and policy interests. Including mechanisms for economic reporting that would need to fall within the purview of higher-level sustainable development reports, monitoring would need to be compatible with or evolve out of current national monitoring frameworks. It would be especially crucial to take advantage of this chance to reframe the ultimate goal and performance indicators of national development as human well-being rather than just economic growth, as is currently supported by both academic and policy schools of thought. While the technological underpinnings and political impetus are there, thanks to the Sustainable Development Goals, bringing about the required changes still requires a narrative that makes sense conceptually and a transition plan.

The Sustainable Development Goals are applicable to a wider range of players in general and a variety of actors interested in measurement in particular due to their greater emphasis and universality. Using a supply and demand perspective with distinct "instrument constituencies" tied to each is necessary to comprehend the role of agency in measuring the Sustainable Development Goals. Compared to prior experiences, each may have brand-new meanings. Measurement literature has always been dominated by supply-side interests, taking an implied "if we build it, they will come" stance. However, more recent interest in the use and impact of indicators—illustrated, for instance, by the designation of the 2016 annual conference of the Community Indicator Consortium, a US-based organization—shows the need to move beyond this position in the case of place-based measurement initiatives, and it is even more crucial to do so in the case of the Sustainable Development Goals.

The Independent Expert Advisory Group's report on the data revolution and earlier reports have demonstrated the need to improve the monitoring and observation capabilities of actors who have historically filled these roles, including statistical and remote-sensing organisations like the UN Statistics Division or the Group on Earth Observation at the global level. Nevertheless, a far larger spectrum of actors, from civil society to the business sector, are increasingly engaged in monitoring and observing due to growing actor interest and the widespread availability of enabling technology. The development of organised integrated monitoring and sustainability indicator activities may be based on a variety of reference systems, including community, region, nation, sector, commodity, or organisation. Although many of them span wide topic interests, they often just address some portions of the larger Sustainable Development Goals agenda. The Sustainable Development Goals will place increased focus on integrating or synthesising sustainability information from various sources and will either ask for new players to participate as information providers or current actors to improve their data providing and integrator roles. There are an increasing number of initiatives underway, including UNEPLive, with the eventual goal of granting access to observation and measurement data produced by conventional and unconventional players on a worldwide scale. These may aid in the monitoring of the Sustainable Development Goals, but on a national scale, it is probable that additional organisational resources and platforms—possibly even brand-new institutions—will be required to meet the requirements of reporting on the objectives. While it is unknown if the objectives' framework

will aid in structuring these projects, it definitely has the ability to do so given the wide range of themes it covers, the information requirements it addresses, and the political support it has accrued over time.

The demand-side interest in tracking the Sustainable Development Goals and related indicators will include players that have typically been more on the fringe of the sustainability discourse, similar to the supply-side interest. Transparency in monitoring information access and timely access are key factors in determining if this occurs. Even though it may bring additional difficulties in a world where data are combined from many sources, some of which may have privacy implications, publishing current indicator information is a well-covered area of interest to mainstream measurement and reporting companies. The fact that more and more types of players will be interested in adopting the Sustainable Development Goals' metrics poses a more difficult demand-side problem, too, if they do actually become a globally significant agenda. The potential for conflict between the use of indicators for the Sustainable Development Goals and more conventional forms of indicators will rise with greater attention. The use of indicators is multifaceted and may be symbolic, political, technical, or a mix of these. The manner in which indicators are used will ultimately decide whether they have an impact on real results and policy. The usage of indicators is a function of ownership, which has a direct bearing on who owns the Sustainable Development Goals as a whole. Nilsson and Perssonemphasise the value of a two-track approach in this regard, where national-level, context-specific targets and indicators could ensure maximum relevance to actor interests while a higher-level international system of indicators in a common reporting framework would ensure at least some comparability. The two tracks wouldn't immediately cross over, but they would agree on topics that are pertinent on all levels and, with the help of important players and stakeholders, increase SDG ownership.

Meadowsmakes the observation that the process of indicator selection is just as important as indicators themselves in one of the works on the topic that has received the most citations. The creation of measurement and indicator systems for the Sustainable Development Goals may now be seen at two separate levels: global and subglobal, as well mentioned by. Indicator creation is centralised globally and strictly adheres to the objectives specified in the Open Working Group procedure. At the subglobal level, the production of indicators will be decentralised and directed by nations and other subnational entities with more specialised organisational, sectoral, or other interests. While comparable, the choices and procedural challenges at these two levels are different. The goal of the global process is to develop an indicator set that as closely as possible complies with accepted statistical norms and to provide a precedent for what the major quantifiable aspects of the determined Sustainable Development Goals are.

Measurement-system development, indicator choice, and the way indicators are selected at the global level will have a significant impact because any given goal can be measured in more than one way and because the indicators chosen can have a big impact on the targets set, how they are implemented, and what interests they represent. Given that the ability and willingness of distributed networks of subglobal actors to gather and report data will often determine the success of the measurement system, participation and transparency in the global indicator selection process will be essential because these factors greatly influence ownership and buy-in. The UN Statistics Division has been tasked with providing coordination and leadership for the process so that it can fairly reflect political and technical viewpoints and serve as a venue for the discussion and settlement of opposing viewpoints.

A procedure for data collection, monitoring, and reporting is necessary for the larger problem of measurement-system development in addition to indication selection. Breaking from the traditional top-down data gathering and monitoring strategy, SDG monitoring should also take into account creative bottom-up, actor-group focused, or community-driven efforts. This is crucial to take advantage of not just because of the potential that these alternative techniques have to offer, but also because it guarantees stakeholder participation in monitoring, which may increase salience and buy-in. Distributed monitoring and data collecting might boost goal ownership, raise public awareness, and save expenses. The Independent Expert Advisory Group advocated for the creation of a global "Network of Data Innovation Networks," significant financial investment in the collection of statistical and geospatial data, and the free distribution of data that can help raise awareness of the status of the Sustainable Development Goals and foster innovation and better performance.

In addition, the Sustainable Development Goals measuring system will need to explicitly support reporting and progress evaluation, both of which are crucial for accountability and learning. Global-level indicators will need to support Global Sustainable Development Reports, which will be produced under the authority of the United Nations, more and more as the reporting structure develops. Accountability has emerged as a politically sensitive topic during the international negotiations due to the nonbinding nature of the Sustainable Development Goals and the high stakes in terms of investment and policy, with some actors calling for stricter accountability measures and others favouring flexibility. Reporting would need to be accurate, timely, verifiable, free from political influence, based on rigorous methodologies, and widely and publicly accessible in order to be considered trustworthy. These elements might help to making reporting important, with relevant actors—whether government, industry, or civil society—taking the findings more seriously and utilising the knowledge to react and alter behaviour. Although the creation of measurement-systems and indicators is focused around the United Nations and related organisations at the worldwide level, their application at the sub-global level will need its own procedures. With the exception that subglobal processes can start with the outputs of the global process—global indicator sets and reporting templates—many of the issues that are pertinent for developing a measurement system for the Sustainable Development Goals and their indicators at the global level also apply at subglobal scales. While formal statistics, remote-sensing, and reporting institutions may play a crucial role, there is a larger variety of players operating their own measuring systems and procedures at the subglobal level, which can be used to assess the Sustainable Development Goals. This may increase competition for viewers' attention, develop a market for products and ideas, and reveal what possibilities exist for future performance improvement. This creates opportunities for divergence and convergence on a global and national scale; divergence in the sense that competing measurement and reporting processes can lead to different conclusions and encourage alternative implementation strategies and pathways; convergence in the sense that these processes' "sense making" can help various actors recognise their shared interests and the need for cogent, cooperative action.

The Sustainable Development Goals' instrumental component addresses a variety of problems that concern indicator selection and design, as well as those that are connected to the instruments of indicator communication, reporting, and even indicator usage. The tools must immediately interact with and as accurately represent the ambitions stated via objectives and targets as feasible. This poses a huge barrier to the Sustainable Development Goals for a variety of reasons.

While these difficulties were previously well recognised from prior measuring projects, in the case of the Sustainable Development Goals, the problems are more exposed and are subject to more scrutiny since they reflect a greater degree of complexity and more overt political interests. The lengthy international debates on the Sustainable Development Goals gave players plenty of chances to notice that the decisions they made may have an impact on how those goals are implemented. Many design decisions include challenging trade-offs.

One of the most important factors to take into account is that the indicators chosen should, as part of a "package," directly contribute to objectives and aims. Given that the Open Working Group on Sustainable Development Goals' 2014 proposal had 17 objectives and 169 targets, it was inevitable that the indicator system created would, at least initially, be equally complicated. In fact, the Bureau of the UN Statistical Commission presented a list of 304 possible indicators in its early 2015 working draught report, which did not even cover all 169 criteria. Although there is no objective method to determine the ideal number of indicators, the practitioners' community has long understood the need of maintaining the number at a "manageable" level. The issue with the Sustainable Development Goals is that keeping the number of indicators manageable without limiting the number of goals and targets would result in inconsistency because of the close coupling of the elements of the Sustainable Development Goals package and the primacy of goals and targets over indicators. However, there is very little political will to do so on a global scale. This is due to the time and effort put into using the Open Working Group process to come to agreement on the goals and targets, as well as the fact that the parties to the negotiations didn't want to give up hard-won goals and targets that were significant in their own context.

While there is not a precise historical parallel for the Sustainable Development Goals indicator system, many past indicator creation processes featured prioritising and the selection of a core set of indicators. In the private sector, where key performance indicators are established elements of management systems and their practical usage necessitates keeping them focused on primary management goals, indicators have also been prioritised depending on selection criteria. Prioritization will probably occur at the subglobal level as part of national attempts to create objectives and targets that correspond with local context if creating a core set of indicators at the global level is not politically feasible.

A more condensed list of internationally shared indicators may eventually result from this iterative contextualization process, depending on the priority indicators most often chosen by nations and other players. As an alternative, there can also be a rise in the recommendations for key indicator sets. A bottom-up approach to common global indicators is consistent with views that emphasise the learning-by-doing, evolutionary nature of indicator system development. This approach is not without risks, however.

The creation and use of aggregate or composite indices in decision-making is another issue with instrumentation. The current emphasis is on generating indicators rather than indices because of the nature of the Sustainable Development Goals and their goals, as well as the need of directing policy and monitoring. Creating a "super aggregate" sustainability index was not a political priority at the time of the discussions due to the difficulties in choosing more transparent indicators. Indicator aggregates, however, should be taken seriously at some time for at least three reasons.

Secondly, there are several mainstream metrics that are used in decision-making that are not related to sustainability. While there is a sizable body of literature that studies and critically reviews the use, non-use, and misuse of sustainability indicators and indices, there are numerous examples of indicator systems and aggregate indices that profess no linkage to the notion of sustainability and that are used, despite their distortions, such as stock market indices, GDP, or trade-related indicators. The Sustainable Development Goals and the 2030 Agenda for Sustainable Development both need reliable and strong alternatives to measuring methods that have historically excluded sustainability viewpoints if they are to have an impact on policymaking. Given its robustness, the indicator system most likely needs to interact with the UN Statistical Commission's officially approved System of Environmental-Economic Accounting, which is based on the System of National Accounts. The creation and use of indices connected to the Sustainable Development Goals should eventually also be taken into consideration given that many of the measuring techniques now in use employ aggregates.

Second, a number of aggregate indices connected to several important sustainability areas have been produced over the last decades, even if they are not as widely utilised as conventional economic indices. Examples include the Human Development Index and the Environmental Performance Index. These indices are created by reputable organisations using standardised methods; they are based on the best data currently available and have a sizable time series; they are used for benchmarking and comparison, and many of them serve as the foundation for frequently released policy-relevant assessments. The suggested collection of indicators for the Sustainable Development Goals has counterparts for the most, if not all, of its component measurements. It would be logical and consistent with measurement tools that decision makers are already familiar with to take into account their application as part of the planning of the implementation, monitoring, and reporting system for the Sustainable Development Goals, with or without making structural adjustments. To give them a bigger role, it could be necessary to more clearly connect them to the Sustainable Development Goals and the post-2015 scenario.

Another thing to keep in mind when it comes to aggregation is that many of the indices used today have aggregation algorithms that are either too complicated or not transparent enough, which gives them the appearance of being "black boxes" to decision-makers. This either restricts their usage, as is the situation with many sustainability-related statistics, or it leads to abuse and the preservation of decision-making mental models that are fundamentally unsustainable, as is the case with GDP. Nevertheless, there are ways to get around this issue by creating a conceptual design for indicator systems that transparently combines individual indicators with aggregates. An early suggestion made by the Colombian government called for the creation of a Global Dashboard for the Post-2015 Development Agenda that could be used as a tool for decision-making, presentation, and tracking progress towards the Sustainable Development Goals. The Dashboard of Sustainability, developed in the 1990s and subsequently used to create the indicators for the Millennium Development Goals, is a simultaneous display of sustainability indicators and aggregates.

Even if they transcend outside the boundaries of the rigorously defined area of measurement, indicators are intended to be a crucial component of reports on the advancement of the Sustainable Development Goals. The instrumentation and methods of reporting will be crucial to their usefulness since reporting is a crucial component of implementing the objectives and accountability procedures. Even though dashboards and interactive web-based progress reporting

platforms can be useful and offer up-to-date data, simple, indicator-based analyses by themselves would fall short of revealing deeper structural interlinkages that are necessary for comprehending and addressing the nuances of complex sustainability problems. The outcomes of indicator-based models and indicators for the Sustainable Development Goals would need to be supplemented by qualitative data utilising appropriate integrated assessment frameworks and reporting formats, since many of these subtleties cannot even be quantified. The Global Sustainable Development Report has designated the High-Level Political Forum as the worldwide reporting authority.

Given that the Sustainable Development Goals will primarily be implemented at the national level, national reporting tools and procedures are necessary and may be the most important level for reporting. Depending on how involved they are in certain efforts to accomplish the Sustainable Development Goals, various actors may need to lead their own thematic, regional, sectoral, or organizational-level initiatives when reporting at the national level. This may need more participation from other sectors than the different tiers of government than it did for the Millennium Development Goals.

There are several instances of civil society and the corporate sector participating in reporting on the Millennium Development Goals, despite the significant variations across nations in terms of their degrees of development. Private-sector voluntary reporting can build on corporate sustainability reports' experience, such as the adoption of the Global Reporting Initiative standard, and even take the initiative in identifying nationally relevant Sustainable Development Goals, targets, and related indicators to gauge how business can contribute, as was the case in Hungary, where the Business Council on Sustainable Development, a national member of the World Business Council for Sustainability. As a natural foundation for monitoring and reporting on indicators for Sustainable Development Goals, management standards like ISO and the European Eco-Management and Audit Scheme include reporting procedures as a component of management systems.

Despite the fact that sustainability measurement and indicator creation is more accessible to public input, particularly at the community level, measurement is still still seen as a largely scientific and technical endeavour. Government, industry, civic society, and science all have diverse objectives, and they utilise indicators differently and for various reasons even though they are all participating in the same process of developing measurement systems. Building a solid basis for the implementation of the Sustainable Development Goals at both the global and national levels requires understanding the causes for these variations with respect to various areas of measurement-system creation and usage and taking them into consideration.

Uncertainties over who should be in charge of creating the indicators for the Sustainable Development Goals have already surfaced in the global process. Officially, the UN Statistical Commission was charged with the technical task of developing the indicators. Yet as the talks dragged on, nations questioned if indicator selection would also need more robust intergovernmental engagement in the Open Working Group session in April 2015. While some were prepared to negotiate indicators in as much detail as the goals and targets themselves, with Bangladesh stressing that "all data can be manipulated without a careful framework," it was impractical to negotiate in great detail because the task had already been assigned to the UN Statistical Commission and because of the potential number of indicators and the associated technical detail.

The topics stated in the chapter on measuring methods for Sustainable Development Goals are shown in this episode. Although prior researchmakes it abundantly evident that indicators are powerful, high-leverage components of complex systems, policy-makers often still see measurement as a merely technical endeavour. When delegates realised the potential significant implications that developing an indicator system entails while already deeply involved in negotiations on the Sustainable Development Goals, they began to question whether the delegation of indicator development to the UN Statistical Commission was adequate. No such issues were voiced during the previous creation of the UN Commission on Sustainable Development's indicator system: The process began as a scientific and statistical exercise and concluded as such, with no influence on policy, and with no implementation even of the System of Environmental-Economic Accounting, despite the recommendations of Agenda 21. Indicators for Sustainable Development Goals, on the other hand, followed the goal- and target-setting process with a clear expectation that objectives would be significant and implemented. Indicators in such situations are no longer peripheral and solely technical: They are central and political. It is for this reason that we have stated they need to be assessed within a governance framework, not just judged on the match of indicators to objectives or targets. We presented in this chapter a political economy framework with ideas, players, procedures and institutions, and tools as the four fundamental aspects. We illustrated the application of the framework for examining a method to measuring retrospectively, connected to the Millennium Development Goals, and showed its applicability to study the Sustainable Development Goals and that it may serve not only academic, but also strategic, policy reasons.

The policy importance and political elements of indicators are becoming further obvious as implementation of Sustainable Development Goals proceeds. Mainstream indicators such as stock market indexes, economic growth numbers, and employment and inflation data are strong and impact institutional and human behaviour in fundamental ways. If indicators for Sustainable Development Goals are to make an impact, they need to compete for attention and achieve importance in the same theatre of decision making as commonly used economic indicators. This demands more sophisticated knowledge of problems not just connected to technical development, but to policy applications of indicators, which until recently has been a largely ignored area of interest of public policy researchers and indicator practitioners. Research focusing on the uses of indicators indicates considerable changes depending on the kind of use, and suggests that intended applications might already affect indicator system creation. This will be especially essential at the national level, where most of the implementation of Sustainable Development Goals is envisaged.

The establishment of a measuring system for Sustainable Development Goals is both a fresh science-policy problem and an area that may draw on the lessons from the experience with current sustainable development indicators and from the experience of the Millennium Development Goals. It appears that creating a sustainability indicator system on the basis of high-level objectives and targets elevates the stakes and may draw greater political scrutiny of both the process and outcomes. On the other hand, the creation of indicators for Sustainable Development Goals might more strategically rely on two decades of expertise relating to the conceptualization, process design, and use of indicators.

CHAPTER 11

IDEAS, BELIEFS, AND POLICY LINKAGES

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Attempts by the United Nations to write the Sustainable Development Goals have been inspired by a conviction in the need for a more integrated global policy framework and to build more worldwide communities of practise around complexity that include diverse concerns. Ideas are one of the key resources accessible to the United Nations. Lacking extensive material means to effect behavioural change by member states, the United Nations needs to rely back on the capacity to persuade and educate. The Sustainable Development Goals, like other high-level UN declaratory initiatives, are political instruments that are intended to move the international community in a more sustainable direction by creating a powerful narrative about development to focus collective attention and action, articulating common aspirations, setting concrete goals, creating a process of learning, expanding the constituency for sustainability by building bridges between policy communities, and directing the development community's financial flows..

The main idea is that complete connection of problems for a meaningful sustainability agenda needs technical agreement regarding methods as well as moral consensus on objectives and purposes. In the absence of such agree- ment agendas are likely to be disconnected, dependent on tactical links between smaller islands of agreement. Well-established theories exist to account for the emergence of shared norms and understandings and appraise the extent to which expert consensus about the underlying goals of sustainability cur- rently exist at the international level, as well as the extent of understanding about the technical means of achieving them..

UN efforts to couple issues have been based on two strategies: a sweeping comprehensive approachand an incremental additive agenda. We argue that in the absence of consensus on comprehensive sustainability goals, collective approaches to achieving sustainability through Sustainable Development Goals are likely to only occur incrementally as experts and states can reach agreement on discrete goals, their interconnections, and the policies by which they may be attained.

The question of whether governments, civil society, or the private sector make up the Sustainable Development Goals' probable target audience creates an ineluctable conflict. Depending on the main audience, the Sustainable Development Goals' design is important. The goal of traditional conference diplomacy is to create binding international agreements. Civil society works to increase public awareness, for instance via the Stakeholder Forum or the UN Non-Governmental Liaison Service Policy Briefs. The private sector works to create voluntary standards and guidelines for doing business internationally. For the bigger questions including developing an integrated global sustainable development agenda, the audience does important.

Being the main target group for the Sustainable Development Goals, we concentrate on states. We assume that the intended audience in practise is governments and use political theories on

how governments participate in linkage politics since the Sustainable Development Goals development process is totally controlled by countries via the United Nations.

Since 1972, the international community has only partially addressed the environmental agenda by linking the governance of environmental challenges to the governance of topics that are causally related, resulting in a disorganised and ambiguous policy landscape. Policy networks are unable to provide primary decision makers with knowledge or resources for resolving and capturing externalities and synergies across problems. Without taking into consideration the intricate links between the topics on the agenda, global governance activities are likely to be wasteful and unsuccessful. The Millennium Development Goals, which came before the Sustainable Development Goals, were shown to have this as a major weakness. It was more difficult to address the agenda as a whole when poverty reduction, health, inequality, and environmental challenges were dealt with in distinct governance silos.

In terms of national practises, this additive agenda has been successful, but throughout the years, successive statements and endorsements have not forced worldwide agreement or considerable adoption. Several people were concerned that, in the context of those related policy groups' economic and social justice frameworks, the application of the additive agenda to sustainable development may overwhelm the environment. Because of enormous resource disparities across the various policy groups, the environment-security nexus, as well as the development-environment nexus, have both been often questioned by civil society and academia. Even yet, there have been some stronger connections at the national level, notably in the domain of assistance. Beginning in the late 1960s, the academic community began to realise the governance difficulties posed by tightly and loosely connected problems within larger systems theory. Early work by political scientists at the University of California, Berkeley, which argued that the governance of complex coupled systems depended on the social recognitionof the components to be combined was particularly illuminating. This was frequently because of the shared understandings of the relevant scientific community and the international organisations with which these communities enjoy connections.

According to Ernst B. Haas, intersubjective perception determines how much links are noticed and controlled. Based on the ability of advocacy organisations to persuade others, the relationships are socially manufactured.

Haas offers a straightforward matrix structured on consensus on knowledgeand moral principles. Governments and political elites are the main focus of the consensus, while domestic and international epistemic groups as well as norm entrepreneurs often contribute ideas to this body of thought. Agenda selection is influenced by both substantive and tactical links in politics. Social learning results in substantive connectivity. By using more conventional methods like enlarging a pie and logrolling, tactical linkage creates new alliances.

A deeper look reveals that Haas is discussing consensual directions rather than absolute unanimity. His approach really aims to explain outcomes based on the dynamics of change among the primary players. The analytical point is nevertheless important even when the number of ideal forms of negotiation really increases to account for directions of change for knowledge and normative aims on various political actors. The policy agenda will increase to reflect the aspects diplomats identify as interrelated as a result of larger aimsand greater expert consensus

on knowledge. Alternately, ambassadors may arbitrarily and judiciously mix parts based on their personal requirements at home or larger geopolitical goals.

The gaps concerning the political underpinnings of substantive and linkage relationships are filled up by more recent study. Transnational activist networks and norm entrepreneurs are the tools for changing norms. Epistemic communities, whether they are structured inside science or expert panels, acting via international organisations, or giving consensus counsel to the main parties, are the method for changing causal beliefs. International organisations also act as a conduit for the causal ideas stated by epistemic communities. By their literature and in-depth interviews, the epistemic community's causal beliefs have been clearly recognised. The group decides how much debate is acceptable inside the community. The relevant epistemic community is divided among a loose belt of differences and a firm core of shared views, albeit they do agree on how to settle these conflicts. Depending on the specific makeup of the epistemic community, there can be greater disagreement when they are translated into policy recommendations.

We anticipate that the selection of Sustainable Development Goals will be based on the support of expertsand international organisations, supported by normative arguments, given the existence of epistemic communities and normative consensus regarding the need for an expanding agenda. This alignment of ideologies and supportive policy groups will lead to a more extensive political social learning process. When the aims take into account professional understandings, social learning is likely to provide more powerful agendas that can command resources from the global community and more effective results. Without consensus on causal dynamics, we anticipate tactical links in all other situations. Such objectives will advance knowledge of the relationships between the many components of a complex global agenda. It is doubtful that tactical links would result in wider learning processes or be politically durable.

The Sustainable Development Goals do not seem to be nested beneath any higher-order standards that have broad support. Even the obligations set down in the UN Charter, as well as who is responsible for UN action and adherence to the Millennium Development Goals, are still debatable and open to many interpretations. Shared but distinct duties are still only applicable to the climate convention and the Kyoto Protocol, and attempts to expand this to a bigger agenda are extremely contentious in the discussions over establishing the Sustainable Development Goals. The Brundtland Commission Report's definition of "sustainable development" was a tactical compromise, and contemporary debates about sustainable development are torn apart by a persistent disagreement over North-South financial obligations. In a few select groups, there is general agreement on the connections between economic growth, environmental preservation, human rights, security, and justice, but there is little agreement on how to manage these connections. "Planetary boundaries" are debated by scientists, and there are no clear connections between them and how to control society activities so as not to go beyond such global limitations.

As many of the main international environmental accords lack the ratification or endorsement of at least one country that would play a substantial role in fixing the issue at hand, environmental protection also lacks universal or even necessarily majoritarian normative backing. Attempts to address climate change, biodiversity loss, desertification, and precautionary trade agreements all include key governments staying outside. The ozone-depleting substance accords are relatively

anomalous in this regard. During the 2012 UN Conference on Sustainable Development and the talks that followed, it was claimed that human rights were a core higher-order norm that could support the Sustainable Development Goals. Unfortunately, the ideas of human rights and sustainable development have not yet been adequately established to provide normative consistency.

Overall, the results of the Millennium Development Goals appear to support this theoretical perspective. As a result of the fact that it did represent societal norms and causal understandings, poverty reduction was successfully handled. On the basis of widespread causal assumptions and normative acceptance, several health objectives were substantially attained. Several of the Millennium Development Goals' other objectives have had less success. The Sustainable Development Goals may learn a lesson from the Millennium Development Goals. Since the indicators and benchmarks for the Millennium Development Goals were created by the Secretariat without the involvement of governments, they increased scepticism among UN member states. States have taken special care over the two years of deliberations in the UN General Assembly and via the Open Working Group to maintain control over the process' results as a result of their previous experience.

Sustainable Development Objectives, Norms, and Causal Consensus

Therefore, given this theoretical framework, what are the chances of achieving the Sustainable Development Goals? The development of the Sustainable Development Goals had to rely on identifying consensus behind individual goals rather than a top-down process based on the presumptive need for a comprehensive package of issues because there were no universal beliefs about universal interconnections between issues. We focus on certain problem domains that are likely to meet the approach's causal and normative criteria. We anticipate that concentrating on such distinct subjects over time may foster policy-relevant learning regarding their relationships. We take into account a broad range of potential candidates for the Sustainable Development Goals created from "The Future We Want" from the 2012 UN Conference on Sustainable Development, the Expert Group Meeting on Science and Sustainable Development report, the Open Working Group agenda, and other concerns that have been raised in this process. This covers a broad variety of topics, some of which build on the Millennium Development Goals, some of which go beyond them, and some of which are a blend of many other topics. Delegates regarded the "green economy" and the transition to low- or zero-carbon industrial systems one of the conference's basic aims as it was being prepared for the 2012 UN Conference on Sustainable Development. The topic ultimately failed to get substantial support due to North-South disagreements over funding and distribution. As a consequence, rather than grouping them around a single strategy for decreasing poverty and boosting sustainability, debates on the Sustainable Development Goals have adopted an inclusive approach to concerns. This was highlighted in the Open Working Group's final report, which spent the majority of its time working towards 17 various objectives.

The Sustainable Development Goals conversations were changed as a result of epistemic communities' and normative entrepreneurs' forum hopping. Several of the players may have preferred parallel debates on these problems in the United Nations, in environmental treaty regimes, and in other international venues like the World Trade Organization and World Economic Forum. While the epistemic coherence of the Sustainable Development Goals agenda

may be fairly low, this may be due to the time and energy that was invested in other venues to persuasion. Analyzing consensus across issue areas is difficult, and assertion of consensus may be deployed by actors to reduce space for other actors to contest the efforts. As justified above, our approach to measuring consensus largely focused on increasing or decreasing consensus at the international level for the period 2010–2015. It is possible to gain a comprehensive understanding of the growing causal and normative consensus by evaluating the coherence of the discussions across various forums, including the 2012 UN Conference on Sustainable Development, the World Business Council on Sustainable Development, and the World Economic Forum.

The drawback of this technique is that it could mistakenly find agreement in situations where parties have ceased disputing but significant differences still exist, and that some of these concerns may be contestable at levels other than the international. While it indicates the intersubjective knowledge of the individuals involved, the functional consensus assessed here could, nevertheless, be most pertinent for determining the processes that gave origin to the Sustainable Development Goals.

Low Consensus Areas

Simply put, there are no clear causal or normative basis for matters like education or urban sustainability. This may be the outcome of severe causal link ambiguity, partial causal agreement, and fundamental disagreements over epistemological and moral principles. The instance of education talks serves as a demonstration of such disparities. While education is among the first subjects to have produced objectives and targets at the global level, they remain general and concentrated on issues that have widespread support, leaving important areas undiscussed. While studies from UNESCO and other organisations have looked into these additional issues, the governance targets established at conferences in Jomtien in 1990 and Dakar in 2000 and included in the Millennium Development Goals have all remained narrowly focused on ensuring that everyone has access to education and reducing gender disparities. While the Education for All coalition of UNESCO has tried to address these concerns, there is still a lack of comprehensive advice. Information communication and technology may be the perfect illustration of these problems because efforts to develop shared causal and normative understandings for interactions with other aspects of sustainable development have been constrained by the agenda's predominance of technical issues related to the specific field. Actors involved in the environment and development call for engagement with information communication and technology challenges, but there is no clear agreement on how to do so. Some topics, including urban sustainability and sustainable transportation, have not had a causal or normative consensus, partly as a result of divisions within their areas more broadly.

A causal or normative agreement has emerged on climate change, desertification and land erosion, and public health, but the remainder of the sustainable development agenda has not yet been sufficiently affected. The applicability to the sustainable development agenda is unclear, despite major attempts to create basic causal understanding, information that can be used in policymaking, and norm dynamics with regard to climate change. Even while the Millennium Development Goals made great headway on specific health concerns, the extension of public health more broadly has faced more severe opposition. Nevertheless, the relationship between other concerns on the post-2015 agenda and climate change adaptation is far hazier. Similar

dynamics may be seen in health difficulties, ocean problems, land degradation, and desertification. As the Sustainable Development Goals change and tactical links give birth to higher-order social dynamics, these problem areas may be expected to undergo transformation. Nevertheless, the growth of causal knowledge within the particular issue areas does not ensure interlinkage comprehension. In the last part, we will examine this procedure.

State and nonstarter actors have made substantial investments in building a solid normative underpinning for action in the areas of gender equality, human rights, peaceful societies, and governance, but this significantly outpaces causal consensus. Although norm pushers have been crucial in drawing attention to these concerns, presentations of sustainability sometimes use "add-and-stir" or "silver bullet" arguments that downplay the intricacies of connections between different sustainability challenges. With a clear emphasis on individual personal liberty, key players, for example, are lobbying for the inclusion of human rights in the agenda of Sustainable Development Goals. Prominent countries, international organisations, and nonprofit groups are included in this category. Yet, the explanation of the relationships and interconnections is often a "silver bullet" explanation that sees human rights as being crucial to every other problem.

These topics are often raised in discussions about the Sustainable Development Goals without regard for importance or other relevant links, instead being pushed for as a universal integration across all issues. As there are strong normative communities on certain particular topics, but not on sustainable consumption and production as a whole, this makes sustainable consumption and production a discrete issue area for understanding. A partial framework and some common ground on the subject have been supplied by initiatives like the UN Environment Programme's Green Economy framework, but not a fully formed concept.

High Consensus Areas

The fields of food security and nutrition, water security, and energy security have seen the most substantial growth of causal agreement and normative consensus. We simply apply these ideas in the manner in which writers and expert groups that we have studied have done so.

The degree of agreement is partly a product of actors' conscious attempts to make new connections about the links between distinct concerns. Yet, part of the agreement was simply based on players' previous knowledge of the problems' obvious interrelationships in the many issue areas. While none of these three problem areas has reached complete causal agreement, all three have seen contestation decline as a result of partial agreement.

With the 2007–2008 food price surge, there was growing agreement on the need to integrate rural farmers into bigger supply networks for food security. The use of genetically modified organisms, loans to such rural agriculturalists, and other significant problems continue to be hotly contested, although agreement has increased. Similar to other concerns, the integrated water resource management approach has attracted agreement. When integrated water resource management gained significance on the world agenda, earlier discussions about the neoliberalism of water resources and the scope of water management became less relevant. Throughout integrated water resource management, significant implementation and operationalization consensus continues to be difficult. The non-interventionist stance on the global energy market is maintained by energy security concerns, which also aim to eventually uncouple emissions from economic output. Yet, the tale continues to focus heavily on nuclear problems.

Food Safety

The circumstances of growing agreement and the possible effects from this consensus are shown by the food concerns. The normative framing of "food security" and a common emphasis on supply-chain concerns by many organisations have enhanced consensus since the food price surge of 2007–2008, even though there are still considerable disagreements and discussions on important areas of the agenda. We give this instance a lot of attention since it raises important questions about water and energy that are covered in the discussion that follows.

In the years before to the worldwide surge in food prices in 2007–2008, there was little consensus on the issue of food security. The World Economic Forum reports from the middle of the 2000s placed more emphasis on major agricultural growth at the national levels than on small-scale agricultural enterprises. The exclusive emphasis on international agricultural commerce has sparked an aggressive backlash against the agenda, which is centred on the "food sovereignty" initiatives. The globe was generally "taken off guard" by the food price jump of 2007–2008, which was linked to the more serious financial crisis and an increase in energy costs. Early in the new millennium, a number of other entities notably contested the World Economic Forum's free market strategy. Although there is still much disagreement on many topics, particularly those pertaining to sustainable agriculture, farmer access to financing, and genetically modified organisms, there is substantial agreement on the importance of local landowners in the supply chain approach to food security. Local agriculturalists being able to connect to these supply networks is considered as the answer to the policy dilemma of ineffective and unproductive supply chains. This agreement is evident from the growing coordination between the organisations focusing on agricultural trade liberalisation and the UN system's efforts to address hunger-related concerns.

Although real prices had been falling over the preceding 20 years and there had been remarkably little price volatility in the vicinity of the declining trend, the majority of states and international players were surprised by the sudden worldwide jump in food prices. Although prices did not rise to the level of the most recent severe worldwide food crisis, which occurred between 1973 and 1975, they did start to rise in August 2006 and climbed dramatically, with rice prices showing the largest global surge. While the causes of the food crisis were varied, several national policymakers reacted to its worsening effects by prohibiting or restricting food exports in almost 40 nations. The circumstances for institutional reevaluation at the global level were created by the food shock, the surprise to policy makers, and these national reactions. Although prices momentarily steadied, 2010–2011 saw another rise.

The United Nations has had a variety of agencies devoted to concerns of hunger and agricultural productivity in general for many years. This comprises the World Food Programme, the International Fund for Agricultural Development, the UN Food and Agriculture Organization, and other organisations. These organisations, especially the FAO and the World Food Programme, have extensive histories of addressing hunger-related problems and play a vital role in global agricultural and hunger policy. Yet "the UN itself was strangely unprepared for the price surge policy dilemma of 2007–2008. There was no planned large conference on food insecurity. In the medium term, the institutions made extensive efforts to feed the needy and increase agricultural output, but there did not seem to be a clear agreement on the long-term governance paths towards food security. The UN system started making attempts to react

substantially in the early part of 2008, but without continuous efforts to create an international response and without a toolbox of policy alternatives to provide to governments. In April, the UN System High-Level Task Force on the Global Food Security Crisis was founded, and the June bio-energy conference's focus was changed to include a more comprehensive discussion of food security.

The Committee on Global Food Security reform, which took place inside the UN system, was the most major institutional change. Although being founded during the crisis of food prices in the 1970s, the committee "has played a very limited role in international politics and was largely ineffectual and inactive owing to a lack of enthusiasm and buy-in from member nations and inadequate resources for its activities. Negotiations between the bureau of the Committee on Global Food Security and other stakeholders led to a drastically modified institution by 2009 after the decision to undertake considerable change in 2008 was made. Meetings were promoted, the institution was reinforced, and ties to civil society were enhanced. At the time of this reform, food chains and supply networks were not highlighted as a crucial component of the food security agenda; but, by 2011, the challenges of food chains appeared substantially in the conversation. Regarding the main points of this chapter, one significant aspect of some of these discussions is the way in which energy and food security were frequently viewed as being intertwined, with renewable energy sources being seen as essential for integrating rural farmers in developing nations into the global food supply systems.

As a result of the agricultural trade discussions' reliance on price stability over the previous ten years, the World Trade Organization was equally unprepared to handle the food shock. Also, the protectionist measures taken by certain WTO members to safeguard their domestic food supplies were considered as a fresh obstacle to the institution's founding ideals. The topic of agricultural trade was a major focus of WTO meetings that were scheduled for July 2008, but considerable progress was not made. Both those arguing for keeping national policy chances to cope with such shocks and those arguing for a speedier conclusion of a trade liberalisation agenda referenced the rise in food prices at the conference. So, the 2007–2008 food price surge created substantial issues for the current WTO discussions. After then, the emphasis shifted to creating strategies that could “that the global market is an accessible source of food supply. A "compatibility check" between WTO regulations and international initiatives to address the surge in food prices was demanded by the UN Special Rapporteur on the Right to Food. Improvements to the global food supply networks' speed and reach were given special attention. This is stressed in a policy reflection on the food crisis conducted by the least developed nations for the July 2008 WTO summit. Whether WTO regulations hinder crisis responses or may help get the ball rolling on remedies was the main topic of debate. Participants at this forum questioned the use of biofuels, structural adjustment programmes, and the exclusion of many developing nations from regional and international food supply networks. Although if trade liberalisation is still the organization's principal goal, attempts to link up with this supply-chain emphasis on food security have started to be seen as a WTO-based reaction to the price surge.

Several important attempts at governance went beyond these two organisations. The problem was raised by the Group of 20 major economies in 2011, and their first action plan focused on raising agricultural output in poorer nations and improving market transparency. While other initiatives may have been drowned out as a result of the Group of 20 debates, their emphasis on supply-chain issues of food security is primarily a result of conversations that took place inside

the UN and WTO. Other institutions, such as the UN Commission on Trade and Development and the Organization for Economic Co-operation and Development that have taken up initiatives relating to food security are dealing with a similar problem. These initiatives, which followed the example of the WTO and the UN system, concentrated on the supply-chain problems that resulted from the price surge.

For many years, there have been frequent discussions on food security. By 1990, the Web of Knowledge included 25 entries on "food security," and in the 1990s it developed into a framework for organising worldwide conversations on hunger and malnutrition. Attaining "food security for everyone and to a continuing endeavour to eliminate hunger in all nations, with an urgent eye to decreasing the number of under-nourished people to half their current level no later than 2015" were the main goals of the 1996 Rome Declaration on Global Food Security. The Millennium Development Goals, which focused on hunger and nutrition, would ultimately be built around this objective. The Rome Declaration on Global Food Security places particular emphasis on three facets of food security: "availability of essential foods, stability of supply, and access for everyone to these supplies".

The NGO forum at the meeting questioned global economic structures, most notably a governance system based on intellectual property rights, extensive use of industrial agrochemicals, and the use of genetically modified organisms, and encouraged a greater focus on agrarian reform to support smallholder agriculturalists. A number of nonprofit groups organised the first challenge around the competing conceptual framework of "food sovereignty. This calls into question the Rome Declaration's emphasis on the global market by focusing on rural lives. The use of biotechnology and genetically modified organisms to combat hunger and malnutrition issues was largely disregarded in the Rome Declaration, but this would later become a very controversial topic in talks about science and government. In order to address the controversy surrounding biotechnology, the FAO founded the FAO Biotechnology Forum. During their first meeting on the topic in 2000, the "polarisation" of opinions concerning biotechnology and hunger issues gained centre stage. The debate over this takes many different forms, with various nations, international organisations, and even the NGO community placing different emphasis on whether biotechnology can help with production in developing nations or whether it should be regulated and used with caution. The political institutions provide chances for increased work on food security concerns and may be well positioned to handle interactive sustainability components, notably the Committee on Global Food Security and its linkages to civil society.

Water

The epistemic agreement on water-related problems is mostly restricted to integrated water resource management and a conception of water in terms of security. While these two concepts don't really conflict, their combination has had a big influence on arguments about global policy. Internationally, holistic water management has a lengthy history that at least dates back to the UN Conference on Water in 1977. Although though several players were experimenting with holistic water management in the 1980s and early 1990s, the World Water Council's founding in the mid-1990s marked a genuine turning point for integrated water resource management. To promote integrated water resource management and certain particular policies, such as complete water price and enhanced supply systems, this nongovernmental think group conducted a number of international events. The World Water Council has convened several stakeholders for six

World Water Forums so far, and they have repeatedly urged the adoption and improvement of integrated water resource management. While not the first organisation to advocate for integrated water resource management, the World Water Council had a significant role in setting the agenda. During their second World Water Forum in 2000, there has been a considerable rise in the number of scientific publications and the use of integrated water resource management by corporations and nonprofit groups in a number of projects.

With significant disagreements amongst players over how to address the privatisation of water resources and dams in the 1990s and early 2000s, there were still significant concerns with building a normative consensus around water issues. A number of governments have also acknowledged the need of integrated water resource management, but implementation has proven challenging, and many players have found it very difficult to articulate comprehensive policies. Despite these issues, integrated water resource management "played a role in smoothing out a number of sensitive conflicts in the area of water resources, such as the debate on neo-liberalization of water governance, the debate over the scale at which water resources are best managed, and about the roles and responsibilities of various policy actors," according to the study. Instead of a fully established policy-relevant framework, there seems to be agreement on the basic frames of debate for integrated water resource management. The concept is still ambiguous, and efforts are concentrated more on persuading stakeholders to accept the framework than on producing precise, policy-relevant information.

While integrated water resource management had begun to take shape in the early 2000s, water security would not take on its normative form until much later in the decade. The business and economic community started concentrating on and developing an agenda for water security after the Global Business Council for Sustainable Development's 2002 report "Water for the Poor" was released. When the World Economic Forum took up the topic in 2008, the discussion became more organised. At this moment, the World Bank and the International Monetary Fund were creating policy frameworks related to water security, but a clear worldwide agenda was still extremely divisive.

Much controversy was created at the national and international levels by privatisation and corporate control of the water supply. The food security alliance, which was made up of corporations and other players and was focused on promoting technical advancement and improved water pricing, had started to form the broad contours of a standard for decentralised water administration. In order to promote water security via improved industrial, agricultural, and residential water usage, policies on water planning, allocation, and price are required, according to a 2013 UN-Water study on water security. The World Economic Forum and the Global Water Partnership used the increased attention on water as a result of the 2005-2015 Decade of Action on Water for Life and the 2013 International Year of Water Cooperation to create much more focus on these fundamental issues. The groups organising around integrated water resource managementand the groups organised around water securitydid the same. The two groups began to overlap as a result of these continuous dynamics. Water security was underlined in several publications and events as a component of an integrated, all-encompassing strategy for managing water. The fundamental issues around operationalization, community participation in management, and various perspectives on water resources—from a human rights perspective to an economic commodity approach—remain under the broad rubric of integrated water resource management.

Security of Energy

The core tenet of arguments for energy security is the conviction that reducing the vulnerability of the energy supply will be largely dependent on markets and technological progress. This is a result of the global energy supply becoming more complex, decentralised energy supply systems initially failing to provide reliable power to all, and the decline of competing international institutions regulating energy supply. Advanced market models enabling nations to comprehend their energy security as well as a number of indicators to quantify vulnerability and insecurity have been created as a result of these procedures. Application of energy security to the green economy framework has concentrated on lowering energy market volatility, increasing the supply of advanced power, and attempting to cut carbon production in the context of these basic processes. Energy transitions and energy efficiency have received support from international organisations as crucial components of strategies to uncouple economic output from energy intake. According to a 2013 study from the International Energy Agency, "findings demonstrate there is tremendous potential to divorce economic growth—and energy production and usage, in particular—from its established environmental implications. The UN Energy Group stressed efficiency and decoupling in numerous reports, and the UN Sustainable Energy for All project is primarily focused on decoupled energy efforts and energy efficiency. In a similar vein, at a prominent side event at the 2012 UN Conference on Sustainable Development on "Decoupling for Change," both efficiency and decoupling were emphasised. Energy supply and demand connections may be stabilised by the use of smart grid technology, the incorporation of renewable energy sources, and general efficiency improvements. The consensus on developing frameworks that support "smart globalisation," as the World Economic Forum calls it, and better trade relations in energy, technology, and ultimately engineering knowledge may constitute a cogent normative and epistemological objective of these various international organisations.

The specifics of this process are still up for debate, despite efforts to lower price volatility and a general belief in the market's ability to carry out a long-term transformation. The best example of this is nuclear power as a source of energy security. The International Energy Agency backed a rise in nuclear energy investment just before the Fukushima nuclear accident in Japan in 2010 to help with carbon reductions. The International Renewable Energy Agency's attitude to nuclear concerns was heavily contested in its early years, which ultimately led to the agency's director rejecting nuclear energy as beyond the agency's purview.

Even though international organisations are increasingly supporting technological, market-driven solutions and economic knowledge about supply and vulnerability indicators based on these models has advanced, it's possible that this isn't exactly reflective of the epistemological and normative consensus that our framework would expect to be necessary. For instance, in this situation, the appearance of epistemic consensus may be caused by the normative agreement of powerful actors. It may be difficult to clearly recognise issues due to the prevalence of economic models in energy systems and the presence of significant institutional players. Nonetheless, the application of this work to policymaking may lead to a functional epistemological agreement that produces comparable outcomes.

Developing a Cascading Sustainability Agenda: Dynamics and Interactions

In addition to having strong policy coherence within their own communities, food, water, and energy security may also have links to other challenges. Notably, the interaction between the

three issues has received considerable attention in recent years due to the "nexus" focus, including at the World Economic Forum, the UN Department of Economic and Social Affairs, and separate Nexus conferences in 2011 and 2014 organised by the Stockholm Environment Institute. Nevertheless, there isn't a nexus community yet, thus interactions are still based on one of the other policy groups. Different problem islands continue to form the landscape.

As the process progresses, though, some of these problems and linkages could be enlarged via social learning. The relationship between food security and water security is the most probable problem in this situation, both because the problem regions are related and because the communities have started to interact significantly over the previous several years. Energy is often mentioned with these other challenges, but the relationship seems to be restricted to biomass production and how it affects food security, with little to no wider involvement. These problems may be related to others that don't have favourable social learning environments in various ways. Synergies between fossil-fuel subsidies and mining might benefit energy security and sustainable consumption and output. Similar opportunities for links exist in the areas of employment, sustainable cities, and food security. There may be a policy area that focuses on rural employment and connects the three. There is room for this shift from the present normative and epistemological emphasis on food security, and some preliminary conceptual articulations that may produce outcomes. There are potential for more conventional issue-linkage and learning from these problems, in addition to substantial learning between issues. There are potential to integrate finance and technology advancement with policy reforms in the areas of water, energy, and food. A reinvestment in rural regions was intended when food security was first mentioned in 2008, but no consistent support developed across nations. Although there may be a connection between food security and rural work, for instance, conventional bar-gaining is more probable. Similar to this, if integrated water resource management receives more money and improvement, recognitions of links between water and environmental concernsmay lead to agreement. Similar to how governance problems have dominated debates about water, the Sustainable Development Goals have continuously stressed human rights. Some of the strategic connections between these three challenges are shown in the treatment of water, energy, and food by the World Economic Forum and the Global Business Council for Sustainable Development. Tradeoffs are minimised in attempts to address multiple difficulties, and efforts to expand technology that addresses all three problems are often the centre of the talks. At this stage, there is little real agreement on interrelated problems being discussed in the numerous talks regarding the connection between water, food, and energy in the World Economic Forum, Global Business Council for Sustainable Development, and elsewhere. The talks that led to the creation of the Sustainable Development Goals at the UN also reflect this. Although certain connections being drawn and the need of focusing on interlinkages, those for food, water, and energy remained remarkably constrained in their all-encompassing perspective. They are typically seen as independent initiatives with little linkage in the final list of objectives.

The High-Level Political Conference and the Sustainable Development Goals may help establish institutional capacity for a longer-term agreement on the development and sustainability agenda. When nations and policy networks gain experience with the governance of specific sustainability agenda items, they may start to see the causal relationships between those concerns and others, which might eventually result in a more complete and interconnected agenda.

Despite the fact that the Sustainable Development Goals heavily rely on the Millennium Development Goals as a framework, the learning dynamics around the Sustainable Development Goals vary from those of the MDGs. In the domains of public health and reducing poverty, the Millennium Development Goals led to some ad hoc and fragmented learning, but nothing in the way of a more comprehensive global policy agenda. The conceptual drive underlying the Millennium Development Goals has been absent from the Sustainable Development Goals. In the first few years of the programme were the Millennium Project, the main scientific network for the Millennium Development Goals, in operation. Project evaluation was often hampered by outdated data that was frequently out of sync with data on other objectives.

The Sustainable Development Goals' epistemic and normative discussions have not been significantly changed by goal-based governance attempts. There is no distinct epistemic or moral foundation for sustainable development in the setting where the Sustainable Development Goals will impact global policy. According to the research above, there hasn't been a recent increase in normative or epistemic agreement on many of the concerns covered by the Sustainable Development Goals. While problem linkage is still conceivable, it is now more likely to be gradual. The research discovered that there is some possibility for social learning, however, since there has been growing agreement in recent years in the international policy communities on water, food, and energy. Although there is dissent and disagreement on these problems at other levels, it has recently been less pronounced at the level of foreign policy. In this context, the Sustainable Development Goals will be implemented, and understanding the problem linkage context will be crucial for the goal-setting exercise to have the greatest sustainable effect.

The potential for social learning within the context of SDGs are probably first restricted to those of food security, energy security, and water challenges. The objectives and indicators for the other problem areas will likely be less sophisticated since typical goal-setting bargaining is more likely to result in them. But, there is room for these to expand to other areas like nutrition, employment, and the broader environmental agenda in the attempts to connect the many concerns in the Sustainable Development Goals, in the introduction of multi-issue indicators, and in the usual logrolling between topics.

Longer term, understanding the relationships between some of the nexus concerns may help create a set of post-2030 Sustainable Development Goals that are more comprehensive. Continued conversations about these points of agreement and their implications for connections to other problem areas may lead to the creation of a future agenda that is more comprehensive and integrated as well as the building blocks for a new Grundnorm.

As actors and institutions address the concerns in the Sustainable Development Goals in widely diverse ways, some of the topics are not covered in table 6.1. Oceans, methods of implementation, and concerns of peace/justice all fall under this category. While there may be agreement on some of them, the topic as it was debated with the Sustainable Development Goals on a global scale was too broad. Our strategy would anticipate, at most, tactical links on some of these concerns.

The many conferences with a nexus subject provide an obvious illustration of these efforts. With the advent of debates of "virtual water" or the importation of agricultural items to substitute native agricultural usage in the late 1990s, the notion of tying food security, energy, and water challenges together in global governance initiatives first emerged. As a result of the 2011

meeting in Bonn, the nexus gained substantial attention on the calendar. The German government brought together a variety of stakeholders to more thoroughly explore the idea for governance, which was developed from conversations at the World Economic Forum and intended to influence the 2012 UN Conference on Sustainable Development. This early emphasis on water, food, and energy as a joint policy response was followed by a series of significant meetings, many of which were centred around the World Decade on Water Action. Recently, the topic of climate has come up often in discourse.

CHAPTER 12
LESSONS FROM THE MILLENNIUM DEVELOPMENT GOALS FOR HEALTH

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It seems appropriate to take into account the lessons learnt from the Millennium Development Goals while evaluating the Sustainable Development Goals. There are parallels between these two goal-based methods despite the fact that the former are global objectives and the later concentrate on developing countries. What are the Millennium Development Goals' triumphs and failings, and how can the most effective lessons be used while avoiding the traps and blunders. The status of the Millennium Development Goals is discussed in the next portion of this chapter, along with which objectives have been accomplished and which goals have had less remarkable success. While much has been accomplished, there has also been a great deal of criticism and doubts about their importance. The challenge of demonstrating a causal relationship between the Millennium Development Goals and actual performance on the ground may be the most basic complaint. In order to draw conclusions for the Sustainable Development Goals, it is crucial to examine the importance of "externalities" to the achievement of the Millennium Development Goals. In UN circles, nothing has been spoken about this important issue.

Our story shows that certain objectives have been accomplished while others have not; they are successes and unmet problems. This may not fully describe the efforts taken and the accomplishments achieved in achieving the different objectives, given that goals may be rather arbitrary and the stark variances in underlying cause elements. In the third segment, we hone in on this component and concentrate on the objectives pertaining to health. As three of the eight Millennium Development Goals are focused on resolving health concerns, they have played a very significant influence in the overall direction of the objectives. Our attention is mostly on Aim 4, which is to reduce child mortality. We will show that many different sorts of actors have put a lot of effort into achieving this aim, and it is especially important to analyse this since at least some of these efforts may be causally connected to the Millennium Development Goals. We shall initially concentrate on the Global Alliance for Vaccines and Immunization to support this. Secondly, as the health-related Millennium Development Goals have been quite high on the political agenda in Norway, we outline and examine the role played by Norway in this context. This demonstrates how different types of leadership may significantly impact how near we are to achieving the UN's objectives.

In the last section, we go through how the Sustainable Development Goals may be created using the knowledge gained from the Millennium Development Goals in general and the health-related objectives in particular.

The Millennium Development Goals' Historical Context

The foundational history of the Millennium Development Goals is provided in this section. To this purpose, it first provides a history of the Millennium Next, it examines the successes and

failings of the Millennium Development Goals by examining the literature that has already been written in this area. The following time periods can be used to categorise goals: from the post-World War II era in the 1940s to the important UN summits in the 1970s; from the International Development Goals proposed by the Development Assistance Committee at the Organization for Economic Co-operation and Developmentin the 1990s; and from the discussions leading up to the UN Millennium Summit in the late 1990s to 2000, when the International Development Goals were modified into the Millennium Development Goals in 2001.

The UN Declaration of Human Rights from 1948, which declares that "everyone has the right to a standard of living appropriate for the health and well-being of himself and his family, including food, shelter, and medical care," is where the Millennium Development Goals got their start. According to this guiding principle, each developed nation was required by the UN resolution "International Development Strategy for the Second United Nations Development Decade" of the 1970s to "gradually increase its official development assistance to the developing countries and exert its best efforts to reach a minimum net amount of 0.7% of its gross national product at market prices by the middle of the decade".

Throughout the 1990s, the need for setting specific development targets increased as a result of the decrease in foreign funding. This political and ideological impetus, according to Hulme and Fukuda-Parr, is what prompted the promotion of international development as a global endeavour. In order to achieve these goals, the Development Assistance Committee put forth a set of international development goals in 1996 with the following three pillars: economic well-being, social development, and environmental sustainability and regeneration.

Given that they lacked a strategy for implementation, the International Development Goals did not, however, have a significant practical influence in many of the OECD nations. As a result, the goals barely received little media coverage. The fact that this document was created entirely by wealthy nations in order to develop a list of feasible, specific, and quantifiable objectives that would appeal to OECD members is also crucial to note. As a result, it is not surprising that "the document's premise and promotion of 'partnership' sounded like standard aid agency rhetoric" among developing nations.

The UNDP's Human Development effort and the World Bank's income and poverty-monitoring programme were significant initiatives that had an impact on the formulation of the Millennium Development Goals. In particular, the UNDP's Human Development Report 1997 concentrated on human development goals based on a human rights approach, such as life expectancy, disease eradication, and adult literacy, whereas the Inter-national Development Goals gave higher priority to economic growth and poverty reduction. Two years later, under the direction of the newly appointed UN Secretary-General, Kofi Annan, who was eager to make global poverty reduction a top priority for the UN agenda, the UN began to define global goals by preparing for the Millennium Assembly of the United Nations in 1998. As a result, Kofi Annan presented the important report "We the Peoples: The Role of the United Nations in the 21st Century"in April 2000 as the cornerstone of the effort to prepare for the Millennium Summit. Along with reducing poverty, it placed emphasis on other issues such as gender equality and women's empowerment, reproductive health, HIV/AIDS prevention, economic growth, access to new technology, including information technology, social development, the environment, and international collaborations to improve development assistance. Despite the fact that the majority of these

objectives were included in the Millennium Declaration, which was adopted at the United Nations Millennium Summit in September 2000, the World Bank, the World Health Organization, and the UN Children's Fund all made significant contributions to the expansion of the declaration's health-related objectives. As a consequence, three of the eight Millennium Development Goalsare health-related. Considering the crucial significance of health-related objectives, their assessments are covered in the section that follows.

Numerous academics have evaluated the Millennium Development Goals' accomplishments and lingering difficulties and formed conclusions for the post-2015 development agenda. While there have been numerous successes with the Millennium Development Goals, this section contends that under-achievement of the MDGs may be understood by Young's concept of "fit," which focuses on how institutions are created to "meet" issues and their remedies.

Existing research evaluates the performance of the Millennium Development Goals, among other significant accomplishments, as follows. First, the Millennium Development Goals promoted improvements in eradicating poverty as well as increased financial aid from institutions and official development assistance and raised the priority of policies relating to eradicating poverty in developing countries because they placed their primary focus on doing so and increasing international development aid. Significantly, the Millennium Development Goals accomplished this through altering language and conventions around development and forming ideological attitudes. Second, they fostered the involvement of many stakeholders in a number of developing nations by strengthening sectoral links between numerous areas, such as health and water quality, sanitation and nutrition, and so forth. On the other side, the following elements help to partly explain the remaining Millennium Development Goals problems. First, there are no connections between the global, national, and local levels, and the ways in which these gaps present themselves differ greatly across nations. Due to internal interethnic and community disputes and the MDGs' emphasis on social service rather than infrastructure, for instance, Africa as a whole achieved far less progress towards the objectives than Asia. Additionally, the Millennium Development Goals are "unfair" to Africa, according to Easterly. For instance, Goal 4 on child mortality is based on proportional terms rather than absolute terms, making it challenging for Africa to achieve this goal given that it is the region with the highest mortality rate in the world.

Also, they don't take into account the geographical context's receivers' requirements. Simply expressed, the Millennium Development Goals did establish a broad objective but did not provide a precise method to achieve it in light of national objectives. This brings up another another flaw that is often mentioned: The objectives lacked means for execution, particularly in terms of money, where they overly emphasised donor assistance. Moreover, Saithasserts that while the objectives are laid out at a more specific level based on indications with a time range, the goals are a "wish list" of sorts. The ability of the Millennium Development Goals to serve as a "programming instrument" to achieve the goals they have set is therefore in doubt. The nature of the targets is addressed in the third broad area of criticism. It was challenging to quantify objectives and targets like human rights, equality, or even the issue of "good governance," which were not included, since the Millennium Development Goals were developed based on the concept of results-based management.

The last and most serious critique is whether any advancements related to the Millennium Development Goals are a direct consequence of those goals or if outcomes are more closely related to externalities. For instance, rapid democratisation and dramatic technical advancements may greatly increase a nation's economic wealth and so help achieve several of the Millennium Development Goals. On the other hand, political corruption or abrupt changes in the political system might seriously impede advancement. The assessment of the Millennium Development Goals revolves on this last point, sometimes known as the problem of externalities or the issue of causality. To put it another way, in order to learn from the Millennium Development Goals, it is necessary to look more closely at the elements forming a causal relationship between the Goals and the pertinent issues. For instance, China has lifted 400 million people out of poverty, but not as a result of the Millennium Development Goals, but rather as a result of the Chinese government's deliberate policies and objectives.

Health-Related Objectives: Successes and Difficulties

The health policy component is the main area covered by the Millennium Development Goals. The health-related Millennium Development Goals are as follows, in slightly simplified form: Between 1990 and 2015, Aim 4 aims to lower the child mortality rate for children under five by two-thirds. Target 5 is to promote maternal health, cut the maternal death rate in half between 1990 and 2015, and provide everyone with access to reproductive health care. Target 6 aims to reduce the number of victims of HIV/AIDS, malaria, and other illnesses by halving by 2015 and achieving universal access to HIV medications by 2010. Some analysts have strong opinions about using targets, particularly when it comes to whether the data we have is adequate enough to gauge what has been accomplished. They specifically draw attention to how difficult it is to get accurate data for the baseline year of 1990. If this objection is true, it likely applies to the most, if not all, of the quantitative Millennium Development Goals. Nevertheless, as we are unable to assess and analyse this issue, we have decided to ignore this methodological ambiguity and utilise official data from the World Health Organization in the following.

Regarding Target 4, there has been a tremendous improvement in lowering child mortality: in 2012, 6.6 million children under the age of five died, down from 12.6 million in 1990. Therefore, there has been an almost 50% decrease in child mortality. Now, the pace of deterioration on a worldwide scale has also quickened. Given that two-thirds of WHO members now have at least 90% vaccination coverage, the rate of immunisation coverage has significantly risen. Yet, Sub-Saharan Africa has a substantially lower score. Despite significant progress, the objective will not be accomplished by 2015. Regarding Objective 5, despite considerable decreases in maternal fatalities, the decrease is less than half of what is required to meet the stated objective. Moreover, less than two-thirds of those of reproductive age utilised contraception. As a result, goal accomplishment here is far lower than it is for the other two health-related objectives.

Regarding Goal 6, fewer people were sick in 2012 than in 2001, however the Sub-Saharan region was home to more than 70% of individuals who contracted the disease. Due to improved treatment, it is somewhat paradoxical that as people live longer, the number of individuals with HIV will also rise; in 2012, there were around 35 million people with the illness, an increase from prior years. Malaria and TB incidence have decreased significantly as well, although progress hasbeen slower in Sub-Saharan Africa. Many geographic regions will nevertheless achieve the health-related objectives without a considerable contribution from foreign assistance.

This holds true for all of Southeast Asia, China, North Africa, and Latin America. Sub-Saharan Africa, Pakistan, and a sizable portion of India provide the biggest obstacles, and broken domestic health systems are the primary bottleneck.

Although some of these encouraging outcomes are undoubtedly somewhat causally related to the Millennium Development Goals, others would have occurred otherwise. TheMillennium Development Goals have inspired, galvanised, involved, and not the least enabled the financing of critical initiatives on a scale that the world has never before witnessed, according to observers who have followed global health politics more carefully than we have. Large portions of the UN family, the World Bank, many nations, and "not least the medical magazine The Lancet with editor Richard Horton at the helm since 2003 has released a variety of series dealing with health-related objectives are key players participating in accomplishing the goals connected to health. Strong condemnation of global injustice has often been made, with emphasis placed on the terrible loss of around nine million lives annually caused by poverty. Unquestionably, the series have added to a discussion whose ferocity is only growing. For health-related objectives, especially the aim pertaining to children, the media's participation is crucial. Global injustice is shown by the dramatic images of suffering children that are featured in TV stories and more immediate access to information. The 1989 Child Convention, which has been approved by all but two nations, may further this objective.

Resources allocated to maternal and child health-related development aid from both public and private sources have risen by almost 400% in recent years. Nonetheless, at that time, the amount of development aid delivered via the UN system decreased. That is, outside of the United Nations, government assistance—not to mention private funding—was responsible for this startling development. Also, the creation of different forms of alliances is crucial. The WHO Partnership for Maternal, Newborn, and Child Health is one such alliance. It has 400 members from public and non-governmental organisations, and its primary responsibilities include advocating and disseminating information for useful initiatives. Another is the loosely coordinated "Count Down" effort, which hosts sizable conferences every two years to assess how well-positioned individual nations are to achieve Objectives 4 and 5. Particularly significant are the sorts of collaborations that have contributed to raising additional money, like GAVI and the Global Fund to Fight AIDS, Tuberculosis, and Malaria, which we will focus on in more detail below.

Different styles of leadership have been crucial, as we shall show in the next two sections on GAVI and Norway's contributions to achieving this Millennium Development Goal. Although GAVI's involvement is a classic illustration of instrumental leadership, Norway's role qualifies as leading by example. Yet if we go a little further, we see that in both situations, person leadership—a factor sometimes overlooked in the literature—plays a significant role. High-ranking officials of governmental offices, international organisations, and private businesses serve as illustrations of how this human leadership also overlaps in the two circumstances. The network may also be considered a little yet powerful epistemic community.

The function of alliances: The Situation with the International Union for the Promotion of Immunization.

The introduction of the Millennium Development Goals in 2000 has nothing to do with the development of GAVI. Yet, as there was a spike in interest and actions on global health at the

turn of the century, the process around the Millennium Development Goals gave its development in 1999 further impetus. Our key worry in this case is the degree to which some of the outcomes obtained in pursuit of this objective have been influenced by this creative endeavour. Hence, we'll start by providing a quick summary of the outcomes that GAVI has produced. Second, we'll talk about the structure of this institution, concentrating on both the collective and individual roles.

The following narrative is based on the second independent review of GAVI completed in 2010. When seen at the aggregate macro level, GAVI looks to have had remarkable results: From the years 2000 to 2009, it disbursed a total of US$2.2 billion to 75 nations. According to the WHO, GAVI's vaccination assistance helped save close to four million deaths before 2009. Of course, there are several methodological questions and disagreements over the data. Nonetheless, even accounting for a sizable margin of error, the WHO assessment report states that GAVI's work has been a highly noteworthy accomplishment. Conclusion: "There is good evidence to suggest that GAVI has been able to attract additional funding for immunisation and its major donors would not have contributed to the immunisation on the scale that they did without it. This has high and direct relevance to Millennium Development Goal 4 in terms of added value. Via its different methods in connection to the Millennium Development Goals, namely the Millennium Development Goal, GAVI has also played a significant role in raising the issue's profile on the global political agenda and in gaining increased funding for vaccination. In summary, GAVI has likely been the most significant method of achieving a rather high target here. The following is a succinct and simplified summary of this intricate and intriguing tale, with a focus on the issues of how and why GAVI was founded and what may account for its tremendous accomplishments.

Due to its high level of UN-based legitimacy and extensive domain knowledge, the WHO was the unchallenged worldwide leader in terms of health concerns between its founding in 1948 until the mid-1990s. For at least two reasons, this began to shift in the 1990s. Not least because to its tense relationship with the pharmaceutical sector, it had far less authority and efficacy in providing new and essential vaccinations. Second, new players emerged at the time, including the more powerful World Bank and significant non-state entities like the Program for Appropriate Technology in Health, which challenged the WHO's hegemonic position. Hence, the late 1990s were marked by power struggles and a lack of coordination between new players like the World Bank and creative non-governmental organisations and existing partners like the WHO and UN Children's Fund.

There was little progress achieved when these parties convened in working groups in 1998 to explore the need to initiate new programmes to speed up immunisation. Suddenly, seemingly out of nowhere, Bill Gates showed in. According to the thorough narrative provided, his interest in immunisation was wholly unintentional. When he finally did, however, de desired a powerful, independent body. He also decided to concentrate on immunisation since it was thought that this would expedite immunisation and save lives. The Program for Appropriate Technology in Health, who first represented William Gates and what later became known as the Bill and Melinda Gates Foundation, began negotiations with the aforementioned actors.

The WHO and UN Children's Fund first acted cautiously, supporting a UN foundation and fearful that a newcomer may undercut their involvement in this area. Via the creation of GAVI in 1999, a compromise was reached, and the Program for Appropriate Technology in Health and

the existing UN entities were made into important partners based on their relative expertise. It has been noticed that a few important people had a vital role in reaching a compromise. Due to Brundtland's more practical approach than her predecessor at the WHO, the pharmaceutical sector was also brought on board. As significant as their contributions may have been, this effort would not have ever existed if the Gates Foundation hadn't contributed the original financing of at least US$750 million. As has been noted, offering a lot of money makes it much simpler for former rivals to reach a deal. The Gates Foundation also contributes to a number of other organisations, such as the Global Fund, and as a result, plays a crucial role in the accomplishment of other Millennium Development Goals.

The partners, who are now seen more as subcontractors, have suffered as the GAVI Secretariat has grown over time. While there are differing views on the importance of this development, it is not the purpose of this article to examine them. The fact that GAVI has continued to provide remarkable achievements is the key factor in this situation. Yet, in our situation, two criticisms could be worth taking into account. One is that GAVI is too preoccupied with its quantitative cost-effective strategy and is oblivious to bigger problems that are harder to handle as well as to quantify and measure outcomes. This critique, which also has implications for the Millennium Development Goals in general, may have some validity. The second argument, which is less prevalent in discussions of the benefits and drawbacks of global governance, is that GAVI is too powerful and dominating and provides beneficiaries too little voice. This fact is both pertinent and intriguing since it shows that powerful global institutions are seldom an issue, but weak ones often impair the efficacy of global governance.

Strong pledges from important donor states—of which, notably, the United States is by far the greatest contributor—have also contributed to GAVI's outstanding accomplishments. Norway, a participant who places a strong importance on achieving the health-related Millennium Development Goals, has also been a key contributor.

The Function of Active Nations: Norway as an Example

Together with partnerships, individual governments have contributed significantly to the governance of global health. Here, we go into further depth on one instance: Norway. Norway is one of the few nations in the world that have consistently contributed more than 0.7% to ODA. Norway contributes about 1% of the global GDP, placing it quite near the top among all nations. Moreover, global health has long played a significant role in Norway's overall foreign policy as well as a component of development assistance. The "classic" health organisations, like as WHO and the UN Children's Fund, as well as more contemporary organisations, such as GAVI and the Global Fund, were founded and funded in large part because to Nor- way. Not least of all the health-related objectives, Norway was one of the key proponents of the creation of the Millennium Development Goals.

This was also influenced by Brundtland's recent appointment as Director-General of the WHO. She was once the longtime prime minister of Norway, a licenced physician, and a well-known personality on the global stage because to her leadership of the Our Common Future effort. She was a good fit for the job because of this. Norway immediately emerged as a significant supporter of these objectives, and the campaign has continued and grown over time. The contribution of important people helped to enhance this. Brundtland relocated Jonas Gahr Stre, her former chief of staff in the prime minister's office, to Geneva as her head of staff, introducing

him to the area of global health in the process. When he was appointed minister of foreign affairs in 2005, a job he held until 2012, he carried this expertise with him. The immunisation of children and world health were prioritised by the new social democratic administration in 2005. Mr. Stre was also keen to emphasise the significance of health in international relations. The Oslo Ministerial Group, a platform for discussion between seven industrialised and developing nations, was founded in 2007 with this viewpoint in mind in order to elevate the importance of health on the global agenda. Prime Minister Jens Stoltenberg was similarly moved by GAVI and Bill Gates' vaccination-related activities. The emphasis on the vaccination's cost-effective health advantages was a reflection of economist Stoltenberg's ideas, who had long emphasised the importance of cost-effectiveness in Norway's climate policy.

He established a network of world leaders and the Global Campaign for the Health Millennium Development Goals in 2007. As a follow-up, he said in 2009 at the UN that Norway will donate 3 billion Norwegian kroner, or around $400 million, to international cooperation for women's and children's health until 2020. As a result, Norway has contributed significantly to initiatives to advance global health; its financing has quadrupled since 1990, placing Norway among the greatest contributors in terms of absolute amounts. This holds true for the WHO, GAVI, the Global Fund, and the UN Children's Fund. The maternal health target has been the one that has received the most funding since it has been the most distantly achieved. In order to help these nations' internal initiatives to promote mother and child health, bilateral relationships have also been developed with India, Pakistan, Nigeria, and Tanzania, four important developing nations. The relevance of people is further shown by Godal's contribution as a major architect of GAVI. As a senior adviser, he has played a crucial role in Norwegian global health policy. Since 2013, the new conservative administration has maintained this active stance, as seen by the nomination of Norwegian Prime Minister Erna Solberg as UN ambassador to monitor progress towards the Millennium Development Goals.

The most recent government white paper on the subject, "Health in Foreign and Development Policy," states that Norway should be actively involved in fostering a strong global consensus for collaboration to meet national health requirements. The administration specifically included the three Millennium Development Goals connected to health when it said that mobilising for women's and children's rights was its top priority. The main thrust of the argument, which was based on Brundtland and her team's work for the WHO, was that improving one's health was considered as a necessary prerequisite for progress and the eradication of poverty. Also crucial to Norway's participation in achieving the Millennium Development Goals is the human rights viewpoint.

It should come as no surprise that Norway was also actively involved in achieving the Sustainable Development Goals. We won't go into great depth on Norway's efforts, but instead focus on the signals that the Sustainable Development Goals send to Norway and how they vary from the Millennium Development Goals. Although the Millennium Development Goals explicitly advocated for Southern aid, the Sustainable Development Goals also highlight the North's enormous hurdles in achieving the aim of a more sustainable future. One could assume that Norway does not have much relevance to the Sustainable Development Goals given that it ranks quite well on international indices of human progress, equality, and human rights. Yet this is false, as the tale that follows will demonstrate.

Like the majority of Western nations, Norway lacks a formal definition of poverty. Yet, according to the most recent statistics from Statistics Norway and the European Union, 11% of the Norwegian population is considered to be at danger of poverty. Despite the fact that the problem has been a top governmental concern for more than ten years, this number has remained constant. Norway has a very small amount of economic inequality, albeit it has lately grown a little. Considering social inclusion, it might be difficult to decide whether and how to incorporate low-income and illegal immigrants. Norway has a very good public health system, but despite having a low rate of drug abuse, it ranks highly for drug overdose deaths, and more needs to be done to lower communicable diseases like HIV/AIDS. Norway also ranks highly on a number of international gender equality indices, but a recent parliamentary report found that there is still much work to be done to achieve full equality.

While most onlookers would argue that these are "luxury concerns" on a global scale, for individuals who are badly impacted, they are certainly genuine. The climate change problem, however, is one area where Norway has significant difficulties and it is crucial to build a more sustainable world. Norway's fossil fuel business is very important to the country; in 2014, it contributed 17% of the country's total GDP, 330,000 people were employed in the sector, and overall investments in it hit a record high. But, Norway has not shown much capacity or inclination to cut domestic emissions. Norway has been a leader in offering international help to reduce greenhouse gas emissions.

Norway gave the 2015 Paris Agreement an extraordinary amount of attention, and several environmental organisations there emphasised the need for Norway to cut its emissions in order to uphold the accord. The introduction of the Sustainable Development Goals and the other concerns described above did not lead to any comparable demands addressing climate. Their adoption received some coverage in the Norwegian media, but it was mostly presented in the same way as the Millennium Development Goals—as a call for better aid to developing nations. This demonstrates how crucial it is to make these ambitious and significant aims known to the public so that they do not stay confined inside the UN building. Academics, members of civic society, and UN ambassadors should all take up this problem examination of the causal relationship between the Millenium Development Goals and actual performance failures. The Millennium Development Goals were mostly developed-focused and driven by a desire to boost international assistance. Since the 1940s, reducing poverty and advancing gender equality, nutrition, education, and health have been major concerns. In general, the Millennium Development Goals are evaluated positively for their achievements in poverty reduction, gender disparity in school education, gender quality, some of the health-related goals, access to improved drinking water, and mobilisation of financial resources for global partnership. On the other side, the Millennium Development Goals have not achieved in areas such as lowering the undernourished population, maternal mortality, attainments of universal access to HIV medication, sanitation, or environmental sustainability. These underachievements are created mostly owing to the “misfit” of the objectives in regard to these challenges. In particular, a key problem resides in the absence of implementation methods. The one-size-fits-all objectives lacked detailed strategies for execution from global to national and local levels, and consequently accomplishments varied greatly across nations. Results-oriented management objectives also failed to integrate crucial topics such as human rights and equality.

Therefore, many have been arguing that the post-2015 development agenda should: I set global benchmarks as well as bottom-up goals in line with national circumstances that are practical and clear,set universal goals for both developing and developed countries, including issues such as climate change, human rights, human security, and governance, along with strengthening cooperation among stakeholders. When it comes to the Sustainable Development Goals, targets are expected to represent sustainability problems, taking into consideration economic, social, and ecological dimensions as well as addressing the underachievements of the Millennium Development Goals. Lessons from the Millennium Development Goals tell us that in order for the Sustainable Development Goals to be more effective and "fit" for the purpose, they need to take into account a multilayered approach in which targets are framed in global terms but should be tailored at regional, national, or even organisational levels to provide a menu of options for actors to select those best suited for them..

Regarding health-related learning, we have concentrated on Goal 4 addressing child mortality, and notably highlighted GAVI and Norway in this con- tract, as examples of the crucial role that partnerships and individual nations can play. The founding of GAVI cannot be intrinsically related to the Millennium Development Goals, but those objectives have helped to organising efforts by GAVIto save children's lives. Notwithstanding various limitations, there is little question GAVI has contributed heavily to a pretty high score on this category. When it comes to Norway, the government would have tried to enhance global health irrespective of the Millennium Development Goals. Yet, there is also a clear causal relationship between these aims and Norway's rising global health initiatives over time.

One reason for the tremendous worldwide efforts to organise support for this aim is the relevance of visualisation via media mobilisation, proven by a scientific publication like The Lancet and its editor Richard Horton. The combination of his moral and scientific authority is interest- ing in a "lesson-learned" viewpoint. The importance of the Lancet and the short case studies of GAVI as well as Norway further underscore the relevance of leadership by people, frequently ignored in serious international relations study. It may well be that less would have been done along this dimension had it not been for these essential people. Leading by exam- ple has also been indicative of the role played by Norway as advocate for the health-related aims. While leadership is vital, however, these lessons also demonstrate the value of mobilising money from more nontraditional sources like the Gates Foundation. Not only may this boost objective successes in its own right, but it may also foster collaboration and cooperation among traditional rivals. This leads to a third lesson, the potential benefit of merging UN and non-UN initiatives. The United Nations is a crucial arena for obtaining legitimacy, but smaller and more flexible groups outside it are frequently required to fulfil ambitious aims. Norway played a major role in fulfilling the SDG objectives. Yet, we have stressed that the attainment of these aims also constitute problems for a nation like Norway.

Corporate Water Stewardship: Lessons for Goal-based Hybrid Governance

Companies are progressively becoming a key aspect in global ecology. Companies are not only marketing their own eco-friendly company processes and goods, but they are starting to hold them- selves more responsible for the activities of their suppliers as well. Additionally, they are increasingly cooperating with international institutions, govern- ments, and civil society groups alike to accomplish objectives of global sustainability. Nowhere is this endeavour more obvious

than in the field of water. According to a recent scientific research, global fresh water usage is one of the three important earth system processes that are quickly nearing planetary limitations. In fact, it may not be long until we pass the planetary threshold for water, since the demand for freshwater is cur- rently anticipated to exceed its supply by 40% in 2030.. Although the water shortage issue is fundamentally a local prob- lem, its cumulative influence may be seen internationally even in water-abundant nations. Water resource management also has a moral component since it is so essential to life. Since the UN Water Conference in Mar del Plata, Argentina in 1977, the UN has thus prioritised ensuring that everyone has access to clean drinking water. Yet it became clear after more than 20 years of conflict that the goal of ensuring everyone had access to safe drinking water remained unattainable. This resulted in the inclusion of water access as one of the MDG 7 objectives. Companies were only involved in the process of achieving this goal on their own initiative, as will be described in more detail below. They were originally more interested in this water objective than any other aims or ambitions. In order to comprehend the role of companies in global environmental governance, the problem of water offers an outstanding case study. Not only has business behaviour in terms of the environment received little academic attention, but corporate political behaviour in terms of environmental governance has just recently begun to do the same. To the extent that corporate environmentalism has been studied, it has, however, primarily been viewed from the perspective of transnational private governance in fields like sustainable forestry and climate change, or from the perspective of international environmental regimes, such as ozone and climate change regimes. The interplay between companies and intergovernmental organisations in promoting sustainability in those circumstances that are characterised by the lack of regimes, either public or private, has not received as much attention up to this point. The purpose of this chapter is to close this gap by examining how the UN has worked with companies to fulfil Millennium Development Goal 7, specifically the CEO Water Mandate of the UN Global Compact. This programme, as its name suggests, was created to alert chief executive officers of water-using firms to water-related difficulties. It was established in 2007 at the Global Compact Leaders Conference and is the only multi-stakeholder forum supported by the UN with the goal of tackling the worldwide issue of water shortage. We should be able to infer implications for the requirements for effective goal-based governance by looking at how the UN has utilised it to elicit cooperation from nonstate actors to achieve Millennium Development Goal 7.

In light of this, I carry on as follows. I first enquire as to why it is vital to examine Goal 7's experience before offering a typology of global governance. Second, I briefly discuss the historical context that gave rise to the Mandate before analysing the UN Global Compact's relationship to non-state actors. Finally, I make an effort to derive policy implications for goal-based governance from this empirical case study.

The mainstay of contemporary global governance is goal setting as a governing method. The international community, for instance, has mandated that both developing and developed nations make planned domestically decided contributions to fulfil the objective of limiting the average global temperature increase to less than 2° C in order to address the difficulties posed by climate change. This has been praised as a balanced "soft diplomacy strategy" by several observers of this process. Would adopting this strategy make governance more manageable and effective? Or will it only increase the difficulty of governance? What impact would such a strategy have on the world's growing "polycentric" global governance?

Naturally, a variety of metrics may be used to assess governance. Some of the most popular metrics for measuring governance include effectiveness, efficiency, equality, manageability, and legitimacy. Similar standards may be used to goal-based governance. For instance, Oran Young says that there should be a limit on the number of objectives and that they should be well stated in order to provide appropriate direction to actors on efficacy. Underdo and Kim both emphasise the value of having a limited number of hierarchically ordered objectives. However, as of the time of this writing, the outcome of the UN's Open Working Group, the primary forum for the negotiation of the Post-2015 Development Agenda, does not meet these criteria because the Open Working Group's hard reality forbids the negotiators to settle for fewer than 17 Sustainable Development Goals and 169 targets. This long list of objectives, in the words of co-chair Ambassador Csaba Krösi, is "a compromise between what is scientifically advised, and what is politically achievable. Given the range of country interests, conditions, and capacities, this conclusion is thus not at all unexpected.

It is true that many of these objectives have cross-cutting characteristics, scientifically speaking. For instance, ensuring sustainable water management has implications for other objectives, such as ensuring food security, energy, and climate change, and their relationships are not always mutually exclusive. Yet, there hasn't been any worldwide consensus established as of yet on how we should combine them into a unified whole. As a result, such inter-goal integration will probably be left up to each country's political discretion. Does this imply that the Open Working Group's efforts to establish objectives and benchmarks were a total failure? The design of each objective ensures that the economic, social, and environmental aspects of sustainable development will be interwoven within it, thus the answer is definitely no. "Each SDGhas its own unique genetic code for global sustainable development," said Ambassador Krösi in 2014.

Given the political reality discussed above, it is important to reflect on our past experience of goal-based governance to examine how the integration of the three aspects of sustainable development was promoted within the confines of a single goal. The High-Level Political Forum may eventually come to play an important role in ensuring coherence among relevant institutions inside and outside of the United Nations. Target 7.C of MDG 7 is a prime candidate for examination in this regard since, like Goal 6 of the new SDG for clean water and sanitation, it intended to assure the provision of safe drinking water and minimal sanitation. Target 7.C also included concerns for environmental aspects, at least implicitly, as implied by the use of the word "sustainable". This is despite the fact that the new Goal is more explicit about environmental aspects such as improving water quality, increasing water-use efficiency, and protecting water-related eco-systems.

CHAPTER 13

FOUR GLOBAL GOVERNANCE TECHNIQUES

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Considering the nature of the water aim, it should go without saying that we must acknowledge that any issue settlement within the framework of the international political system must take place inside the structural bounds of global anarchy. That is, any kind of global governance must unavoidably be dispersed in the absence of a centralised authority. The power possessed by international institutions must be shared with sovereign nations under anarchy. Insofar as international institutions participate in global governance, they mostly do so via states. This necessitates indirect global governance. If the issue at hand is a local one, like a water shortage, then global governance will become more indirect since the desire and ability of national and local governments to handle it will be crucial. This is where Gupta and Nilsson's concept for coordinated multilevel responses makes sense.

A typology that focuses on two important aspects of governance, namely coerciveness and directness, the components featured in the "new governance" paradigm adopted in the public administration literature, can, however, capture more subtle nuances of global governance within this broad structural constraint. While directness indicates the degree to which the international organisation approving the provision of public goods is actually involved in the provision of the goods, coerciveness measures the degree to which a policy instrument used in global governance restricts the freedom of targeted individual actors. This will result in a two-by-two matrix that divides global governance into four categories: rule-based public governance, rule-based hybrid governance, rule-based private governance, and rule-based private sector governance. Rule-based public governance is the most well-known category because it involves intergovernmental agreement on both a common objective and a set of international rules to achieve the objective. In this mode, international laws impose restrictions on governments and other players' freedom to guarantee that they abide by the laws. Governments will be more actively engaged in policing the actions of subnational players, and global governance will be as forceful as it is possible to be given the limitations of the international system. Young may be thinking about this kind of governance when he stresses the need of fusing objectives and regulations. As international regimes include all of these components, this kind of global governance coexists alongside international regime-based governance. The Kyoto Protocol may be used as an illustration of this governance style since it puts penalties on those who violate the protocol while also requiring states to actively regulate the actions of subnational entities.

What are the advantages and disadvantages of this kind of government? The more forceful the tool of government, all other things being equal, the more successful the governance. Effectiveness is obviously a broad notion; it might refer to following laws, altering the actions of certain individuals, or finding a solution to a particular issue. Effectiveness in this context simply refers to modifications in important players' conduct that will aid in the resolution of the issue for

which a governance system was developed. It is also true that the relationship between coerciveness and efficacy as a general law has not yet been thoroughly established. The development of a domestic legal framework that complies with an international regime's requirements, on the other hand, is more likely to result in a change in the behaviour of important players since the efficient enforcement of national law can guarantee their adherence to the regime. The disadvantages of this governance method, however, include greater administrative expenses, the expansion of the public sector, and a loss of political support from those whose freedom will be restricted precisely because administration in this form necessitates such a legal framework. Since not all governments have the power or ability to regulate the actions of subnational actors at the community level, Conca believes that this method of governance may not be appropriate for issues having local implications, such as water concerns.

Rule-based public governance is the antithesis of goal-based hybrid governance, which is characterized by a lack of coercion and directness. Goal-based hybrid governance, therefore, neither imposes costs or penalties on players in the private sector nor places an undue burden on governments in terms of administrative expenses. Since there will be no coercion, this manner of operation will be effective. Because of this, both the government and the business sector would probably approve of this manner. Nevertheless, this strategy has a flaw. There is always a danger that the private players involved in this method of governance—which relies heavily on the cooperation of private actors—will not be as dedicated to the achievement of the objective as its main, a global organisation. The "risk of aim displacement" will probably rise, particularly when the objectives of these individuals significantly differ from those of the international organisation. This method of governance will probably be used for water governance since many water challenges demand a high degree of private sector involvement, as will be discussed below.

The modalities in between rule-based public governance and goal-based hybrid governance are rule-based hybrid governance and goal-based public governance, respectively. Rule-based hybrid governance is characterised by a low degree of directness and a relatively high level of coerciveness. Because of this, the former element is anticipated to assure a certain degree of performance, but the later aspect makes governance more difficult to maintain. With rule-based hybrid governance, private players will be responsible for monitoring and certifying their own compliance with international norms, not an international organisation or a national government. As a result, there is always a chance of goal displacement. Since networks of nongovernmental organisations and businesses are putting the main criteria of the International Labor Organization into practise via a variety of private governance schemes, global governance concerns labour rights may fall under this category. On the other hand, goal-based public governance is distinguished by a low amount of coercion and a high level of directness. As a result, it is anticipated to be less successful, but more manageable due to governments' increased involvement in the governance process. The international framework that has replaced the Kyoto Protocol seems to fall into this category since it would be up to individual countries to achieve the objective of limiting temperature increase to a minimal level. These governments would then have some influence over the private sector.

Which of the four governance models—of which there are four—will be most likely to be used in relation to water issues? Here, two factors can be crucial. One is how much governments rely

on the expertise and resources of the private sector to define and address challenges, and the other is how contentious the topics are.

Both of these characteristics apply to water issues. Governments require the assistance of private actors who have the necessary knowledge and skills to solve these problems because there are so many technical issues involved, ranging from the assessment of the supply of water to the efficient use and recycling of water to the protection of ecosystems. When governmental capacities are in doubt, as they are in many developing nations, this requirement is exacerbated. Indirect governance is consequently required due to the reliance on the knowledge and resources of the private sector. Also, the subject of water issues may be quite contentious. Since water must be shared among business, agriculture, and people, political disputes about who has the right to utilise a community's limited resources and how much they are permitted to use are constant. Offering "options to cut impacted interests into a piece of the action" makes political sense in such situations. Goal-based hybrid governance will thus be the most probable choice for water governance, apart from the government's normal propensity towards efficiency. These two reasons include the governments' reliance on the skills of the private sector and the contentious nature of the problems involved. But if that's the case, we're left with the possibility of objective displacement since more power will be given to the private sector, which is under less supervision of the international organisation. What adjustments may a global corporation make to meet this formidable administrative challenge? Here, the concept of "enablement" skills mentioned in the literature on the new governance paradigm is useful. Three main sorts of analytical abilities are recommended by this paradigm. The first are skills for activation. These abilities may be anticipated to help the principal organise the "networks of players increasingly necessary to handle" the issues. That is, by "encouraging the possible partners to come forward and perform their responsibilities," the international organisation as a principal may offer chances for non-state actors, whether they nongovernmental organisations or companies, to engage in the problem-solving. The second set of abilities the principal must possess is orchestration, since after actors have been brought into a network, the network must be managed in order to create cooperative results that are in keeping with the objective. Similar to a symphony conductor, the principal should interpret what the shared objective involves while "remaining within the limitations defined by the physical powers of the instruments" used to achieve the objective. The outcome will consequently be "a piece of music rather than a cacophony" if orchestration goes well. Moreover, "intangibles" like vision, understanding, and persuasion rather than tangible results are what matter in orchestration. In this way, orchestration presupposes suitable logic. While this idea of "orchestration" has already been included into the literature on international organisations, it is important to underline that its fundamental purpose is to reduce the likelihood that partners from outside the organisation would subvert the organization's goals. In light of this, "orchestration" is described in the context of international relations as the act of guiding and/or assisting a network of various stakeholders in the achievement of public policy goals by using "a broad variety of directive and facilitative approaches.

Modulation skills are the third and last set of abilities the principal should use since, at least for certain performers, persuasion based on the logic of appropriateness may not always be effective. The principal must depend on "rewards and sanctions" to the degree that persuasion is insufficient to get unsocialized network participants to cooperate. The principle must provide

more helpful incentives than negative ones, nevertheless, since goal-based hybrid governance uses fewer coercive tools. The cost-conscious private partners will be driven out of the network if the tools utilised become too harsh. Having established these theoretical foundations, we will now examine the way the UN has addressed the issue of water governance in connection to Target 7.C of the Millennium Development Goal 7. Let's first take a quick look at the context in which this goal was developed.

Historical Perspective

The UN Water Conference held in 1977 in Mar del Plata, Argentina, adopted a similar objective of ensuring that everyone has access to clean drinking water and sanitary facilities long before Millennium Development Goal 7 was established. The UN General Assembly subsequently proclaimed the 1980s the International Decade for Drinking Water Supply and Sanitation in order to achieve this objective. Nonetheless, it was evident that not much progress had been achieved towards the objective by the decade's conclusion. Since then, integrated water resource management—a more complete strategy—has been advocated for by water specialists. This new all-encompassing strategy was expressed in the "Dublin Principles," which were adopted during an international water conference that took place just before the UN Conference on Environment and Development. Nonetheless, since they considered water mainly as an economic good, these ideas had a very neoliberal underlying tone. The privatisation of water supply became seen as the solution to all water issues as international development organisations started to support the concept of integrated water resource management. Large international water providers like Vivendi and Suez Lyonnaise des Eaux got on board and started delivering water in several nations.

After a time, water activists started to criticise this neoliberal worldview since there had not yet been any advancements in the provision of universal access to water and sanitation. The situation exacerbated in certain water-stressed areas, sparking strong anti-privatization rallies. For instance, a Coca-Cola facility in Plachimada, Kerala, was compelled to shut down because it was thought the corporation was depleting the area's ground water. In South Africa, a violent protest erupted when private water companies cut off water supply. Soon after, these movements started to connect across borders, primarily as a result of the World Social Forum’s activities. Activists hoped to emphasize via these demonstrations that only a well-run, democratically accountable public sector could guarantee everyone's access to water and sanitation.

Early in the new millennium, UN organisations started to react to this growing criticism. For example, the World Summit on Sustainable Development decided to make water one of its main issues for sustainable development after the UN Millennium Summit adopted the aim of decreasing the percentage of the world's population without affordable access to clean water by half by 2015. So, a purpose and a target were once again established to emphasise to the global population the significance of water access.

Activation

If the UN were to take on this task, the UN Global Compact Office should be in charge of it since the UN Global Compact was established to encourage corporations to support the Millennium Development Goals and the UN Global Compact's 10 universal principles in the areas of human rights, labour rights, environment, and corruption. 3 In fact, the Mandate was launched by the UN Global Compact Office in the summer of 2007 as part of this objective. In

order to help enterprises develop, implement, and disclose water sustainability practises that would help them meet the Target, a network of corporations, nonprofit groups, and governments was to be established.

The CEO Water Mandate's Origins

Let's start by examining how this project came to be. Gavin Power, Deputy Director of the UN Global Compact Office, who has served as the Mandate's Secretariat from its establishment, claims that the initial proposal for the Mandate was offered by a small group of large-volume corporate water consumers. This is how the concept came to be. Businesses were less concerned with meeting the Millennium Development Goals in general since the majority of the corporations committed to the UN Global Compact had primarily concentrated on developing the 10 principles of the UN Global Compact.

Several of them struggled to comprehend the significance of development concerns, including poverty, for companies. It was because of this that the UN Global Compact Office decided to inform companies about the Millennium Development Goals. Several businesses gradually started to debate internal ways to broaden their corporate social responsibility strategy to include a development component.

The UN Global Compact Office has started talking about ways to incorporate the ten principles into a few specific problem platforms. A few businesses came to Mr. Power at that time and recommended water as a potential area of concentration, telling him that the water concerns were "increasingly essential and substantial" for them. Water was chosen as the best option by Power because it clearly relates to the environmental and human rights goals of the UN Global Compact. Power cites the firms as being the ones who "actually came out and said, 'It would be fascinating if you would consider starting a Global Compact effort on water to assist us get 'deep' into the problem'". The UN Global Compact Office subsequently set up an informational meeting with business officials at the Swedish Embassy in Washington, DC, in response to this corporate effort.

Representatives from six corporations, including Coca-Cola, Levi's, and Nestlé, attended the conference in 2006. This gathering essentially became a brainstorming session that created the Mandate's general structure. Early on, they came to the conclusion that this should be a business programme for large-scale water consumers rather than one for water utilities or distributors. The corporate officials said that they wanted to learn how to overcome obstacles in situations when they were starting to suffer water stress via this programme. They also underscored the reputational and regulatory concerns they were facing since, if they did not behave appropriately in water-stressed areas, they may be charged with stealing water from the local population and might have to pay expensive penalties.

The six key areas, or "the six aspects" of the Mandate, were chosen as a result of this awareness among the participating companies: direct operations, supply chain and watershed concerns, community participation, collective action, public policy engagement, and transparency. They also believed that issuing a list of suggested measures, followed by having the businesses report on them, was the best approach to elicit cooperation from the private sector. The UN Secretary-General Ban Ki-moon was subsequently informed of this concept, and he later made it into a significant deliverable at the 2007 Global Compact Leaders Conference.

The Mandate's Institutionalization

The initial aim was to merely request the endorsing corporations to commit to the six components of the Mandate and to report on their plans and accomplishments. But thereafter, the UN Global Compact Office made the decision to establish an institutional framework with certain organisational resources. A steering committee, yearly working conferences, endorser-only gatherings, working groups, and a Secretariat are now part of the Mandate. The steering committee, which is made up of ex officio members from the Secretariat and ten endorsing corporate representatives selected from each of five distinct areas, is largely responsible for making strategic decisions and providing administrative supervision. Each stakeholder member serves a two-year term on the committee. Moreover, non-voting special advisers representing non-commercial stakeholder interests, such as NGOs and governments, have been added to the steering committee. The primary purpose of endorser-only meetings is to augment the work of the steering committee, particularly when there are issues that should be brought to the attention of a larger constituency. The major purpose of conference calls between working groups, which are often made up of a limited number of people from business and civil society, is to discuss work plans, draughts of guides, and other outputs.

Last but not least, the Mandate's Secretariat is organised in a particular way since it is based on a collaboration with a specialised research centre that is not connected to the United Nations. The Pacific Institute's Jason Morrison, who focuses on problems related to social fairness, economic development, and environmental preservation, collaborates with Gavin Power, the Deputy Director of the UN Global Compact, to operate as the Mandate's Secretariat. The Pacific Institute serves as the initiative's "operational arm" in reality. Coordination of the working conferences, research on subjects pertinent to the initiative's work streams, and assistance to the working groups in the creation of guides on different facets of water management are all tasks carried out by it. This arrangement is "a match made in heaven," as Power puts it. This kind of arrangement does not exist on any of the other "issue forums" of the UN Global Compact. This may be explained by the lack of a UN organisation with specific expertise in providing technical water guidance. Although UN-Water does operate as an interagency body that coordinates efforts on water-related problems throughout the UN system, it is not a technical entity that can provide water-related expertise. In conclusion, the UN Global Compact has not only encouraged companies to actively meet Goal 7's water objective, but it has also contributed to the development of the network of business and nonbusiness actors interested in water concerns by offering a structured institutional setting.

Assessment

Given the above overview of the initiative's institutions, it is clear that endorsing companies participate in the networking activities of the Mandate at its annual working conferences, where they exchange best practises, discuss challenging problems, come up with workable solutions, and get input from other stakeholders. We thus need to ask the following questions in order to determine the strength of their interaction:

To gauge the level of corporate interest in the Mandate, let's first take a look at the changes in the number of endorsing businesses. There were just five supporting firms when the programme was first introduced in 2007. The number had risen to 75 by the middle of 2010, and as of right now, 129 businesses have joined the campaign. It is true that this problem platform is quite modest,

drawing just a small portion of the approximately 8,000 member businesses in the UN Global Compact. The Mandate's signatories are far less even when compared to Caring for Climate, the UN Global Compact's main environmental concern platform, which has more than 400 signatories as of right now. Nonetheless, the shift in the number of supporting businesses shows unequivocally that corporate interest in water concerns has increased.

Orchestration

The next issue is whether the UN Global Compact Office has likewise orchestrated efforts to foster shared understanding among the stakeholders. If such an orchestration has been conducted, it is important to learn how it was done and what consensus it created on the role of business in relation to water problems. It was decided during the Second Working Conference for the Mandate, held in Stockholm in August 2008, that defining the various responsibilities of public and private players in ensuring everyone has access to clean water and sanitary facilities was the largest difficulty for the Mandate. Two study streams were subsequently established as a result of this: one focused on corporate involvement in water policy and the other on water and human rights. Of the two, the former first garnered greater attention because of its relationship to Millennium Development Goal 7.

Let's first examine how this topic has come to be known as shared knowledge. In this regard, it is crucial to note that the orchestration of the UN Global Compact Office took full use of the knowledge offered by nonprofit groups. To be more explicit, the Pacific Institute and the World Wide Fund for Nature laid the stage for the dialogue that followed between endorsers and other stakeholders right from the start. The Framework for Responsible Business Engagement with Water Policyand the Guide to Responsible Business Engagement with Water Policy, which are the Mandate's final outputs, can thus be said to have had a significant contribution from nongovernmental organisations.

What understanding of the function of business have participants in the business and nonbusiness sectors come to share, then? The Mandate's case may be summed up as follows. Water is a limited and non-replaceable resource that is used by many people. As a result, each user's water usage and disposal habits have an impact on the quantity and quality of water available. So, in order to jointly decrease water hazards, businesses that utilise water for industrial purposes must work with local communities and governments. Undoubtedly, a lot of forward-thinking businesses have started to try to understand their water consumption and disposal both within their fence lines and in their supplier chains. Several businesses, including Coca-Cola, PepsiCo, and Nestlé, for example, now want to become "water neutral," and as a result, they continuously assess their effect on water resources. Without a question, this is a crucial action businesses can take to lessen the effect of their water consumption and output. Such within-the-fenceline water management, however, is not regarded as adequate because one drop of water conserved through one company's internal effort may mean different things for different communities, depending on the amount of water that other users consume as well as on the capacity of the government to police illegal water withdrawals and substandard water discharges.

As a result, the Policy Engagement Framework for the Mandate identifies five main scales for water policy engagement: internal; local ; regional ; national ; and global.

More precisely, through interacting with local communities, businesses may inform other users and worried stakeholders of what they have discovered via water footprint analysis. Companies

must take these actions to lower "the likelihood of future water-related conflicts or disruptions" in light of the conflicting water needs in nearby areas. Businesses could support the development of local water systems by offering technology like clean water technologies and methods for collecting rainwater as well as funding for watershed management. Companies can only assist in lowering their reputational risks to keep their social licence to operate by this kind of local participation.

Also, businesses must interact with governments since "how governments manage water for all users" determines the degree of social and environmental risk businesses may experience. Companies' efforts to increase their own water efficiency will ultimately be for nothing if governments do not have effective and fair policies regarding the development of water infrastructure, water allocation and pricing, management of water supplies, provision of sanitation services, and protection of natural systems. Therefore, businesses must actively participate in public policy processes to ensure that governments enact suitable institutional and legislative frameworks regarding the supply and use of water, equitable access to water, and the quality of water, all while explicitly expressing their concern for the general welfare. If not, businesses will be exposed to severe flood risks as a result of the current state of affairs. In other words, both responsible corporate participation in public policy and community engagement are seen as significant business contributions to good water governance.

So, a worry for the hazards that firms could encounter if they don't participate in collective action and water policy informs this common understanding. Throughout the debate process, reputational and regulatory issues in particular were highlighted. Certain businesses use a lot of water, therefore they run the danger of being hurt when there isn't enough of it. But, people should be aware of other threats in addition to physical ones. Companies should also be aware of reputational risks as businesses may be accused of stealing the community's water in the absence of adequate water administration.

In the worst instance, they can even lose their social permission to function because of their irrevocably damaged reputation. Moreover, they will probably have to deal with regulatory risks because, if businesses can't appropriately manage these "reputational risks," governments will probably be forced to limit withdrawal privileges or cancel their operating licences. Companies will also be exposed to a different kind of regulatory risk if the government doesn't crack down on illegal water users or ambient water polluters, or if it doesn't fairly distribute water permits based on needs. In these situations, the amount of water that businesses can use will inevitably be reduced. Yet, for a variety of reasons, governments in many developing nations typically do not carry out regulatory tasks in a sufficient manner.

Businesses should thus organise governments and communities to set up an effective institutional framework for water governance in light of these concerns. As a result, the Mandate's supporting corporations now place a high priority on policy participation and community engagement. Although some of the endorsing corporations were aware of these hazards from the beginning, it is noteworthy to note that nongovernmental groups modelled these risks and offered recommendations for regulatory measures to reduce them. It is difficult to envision how any common knowledge could have developed without this epistemic contribution from civil society groups. In other words, the coordinated work with civil society groups made the orchestration by the UN Global Compact Office feasible.

The Mandate has more recently started to promote this common understanding under the heading of "business water stewardship." This idea urges businesses to be more aggressive about how they may become the stewards for water while prescribing the same responsible conduct as the Policy Engagement Framework and Guide. In support of this corporate stewardship, the Mandate urged world leaders gathered at the 2012 UN Conference on Sustainable Development to "make water and sanitation a key priority" in a communiqué. Since then, the Mandate has pushed for the inclusion of water and sanitation concerns in the 2030 Agenda for Sustainable Development as a stand-alone goal in the UN's Open Working Group process.

CHAPTER 14

THE RELATIONSHIP BETWEEN TRANSPARENCY AND THE MARKET

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There is undoubtedly a tendency to "greenwash" or "blue-wash" information. For example, businesses could seem to be working with the UN without really supporting the organisation, or they might say they are doing something helpful for the environment when they are not. So, there is no assurance that businesses always behave appropriately. Yet, lying might end up costing businesses money if the truth is revealed, since it could result in the loss of their social licence or, failing that, a loss of customer or investor trust. Companies who are dishonest will ultimately face penalties from the market if they are open with the market. Hence, the key issue is: How has the UN Global Compact Office truly encouraged businesses to be transparent? The Mandate's disclosure obligation should be emphasised in this context. The endorsing corporations are obligated to yearly report their plans and activities relating to the Mandate's six parts in a Communication on Progress as part of their commitment to the Mandate. If a company doesn't comply with this condition, they are delisted. Several businesses that didn't comply with this condition were already delisted. In addition, similar to other UN Global Compact platforms, businesses are classified as "Learner," "Active," or "Advanced" based on the quality of their Communications on Progress submissions. According to the United Nations Global Compact, this classification is meant to "encourage and challenge participants to use more sophisticated methodology and release more detailed" Communications on Progress. This is based on the idea that the more information a company discloses, the more confident other stakeholders will be in that company. Businesses are therefore given strong incentives to act responsibly since stakeholders like customers and investors have the capacity to punish negligent businesses. In order to develop a framework that would incentivize businesses to be accountable, the relationship between transparency and the market is purposefully included into the system.

I have suggested that water concerns would fit under goal-based hybrid governance, which is characterised by a low degree of directness and a low level of coerciveness, under this chapter's typology of global governance based on coerciveness and directness. A possibility of goal disruption between the primary and its third-party partners has also been mentioned, which will negatively affect this kind of governance. As a result, I had anticipated that the in charge international organisation would apply activation, orchestration, and modulation techniques to lower this danger.

I've discovered that activation has actually taken place at the UN Global Compact Office. In order to meet Target 7.C of Goal 7, it has not only organised enterprises into a network of stake-holders, but it has also institutionalised the network. As a result, a favourable atmosphere was established for the UN Global Compact Office to orchestrate its future actions, providing an interpretation of what Target 7.C implies for business. After this, the Mandate participants began to have the same view, which gave rise to the idea of corporate water stewardship. Also, the UN

Global Compact Office has carried out its modulation mission by developing a framework of incentives for businesses to conform to the standards of corporate water stewardship.

The following are the consequences for goal-based governance. First, the United Nations' attitude to water concerns has changed as a result of Goal 7 and Target 7.C being established. The private sector's mobilisation has undoubtedly been made easier by it. In fact, it may have been difficult, if not impossible, for the UN Global Compact Office to participate in goal-based hybrid governance in the first place without the aim and the target. Notwithstanding this, it is not always safe to expect that activation will be followed by orchestration. In the instance of the Mandate, it just so happened that the UN Global Compact Office also orchestrated; nonetheless, it is debatable whether the UN Global Compact Office always orchestrates. It goes without saying that the social construction of business' position in water governance would not have been conceivable if it had not fulfilled the orchestration function.

Yet, it is still unclear if Goal 7 has really been advanced as a result of the UN Global Compact Office's efforts to participate in goal-based hybrid governance. It is true that the globe has achieved Target 7.C five years ahead of schedule in terms of access to better sources of water. Yet, it is unclear how much of this may be attributed to firms' altered conduct. We also don't know how much the orchestration and manipulation of the UN Global Compact Office has affected corporate participation in water policy. However, it's interesting to note that according to a 2009 survey by the Global Compact Office, of all the partnerships the survey's respondents had been a part of, 85% were actually intended to implement Goal 7. Of these partnerships, about 70% had advocacy as their primary goal, and 44% listed governments as partnersand social, economic, and environmental governance more generally, the governance of the SDGs faces three challenges. Examining these issues may help identify the fundamental standards for governance.

Goals versus Rules

Goals have long been a part of governance in many contexts, but compared to rules, less is known about the prerequisites for successful goal-based governance. While Young and Underdal and Kim provide a range of reasonable ideas on the prerequisites for successful goal formation and goal accomplishment none of them have been put to the test. More fundamentally, even less is understood about the causal link between objectives and outcomes despite significant effort being put into measuring, monitoring, and analysing progress on the Millennium Development Goals. Any investigation of how objectives and governance structures affect altering behaviour and results must take into account the diversity of sustainable development factors. Therefore, learning and analysis mechanisms that advance our understanding of the factors that influence sustainabledevelopment as well as the connections between objectives, policies, and plans, as well as enabling factors like capacity building and learning, must be a key component of any governance arrangement. Numerous evaluations of the success of the Millennium Development Goals may be linked to outcomes, such as stakeholder involvement or shifting the emphasis of certain policies, such ending poverty in developing nations. In contrast to, or in combination with, factors like economic liberalisation or other drivers of development over the past 15 years, it has not been studied how these outputs contributed to goal outcomes or how the policies and practises specifically motivated by goals directly contributed to outcomes. We've learned from the experience of the Millennium Development Goals that objectives may interact in unexpected

ways. For instance, attempts to improve environmental sustainability via modern agriculture might impede efforts to eliminate poverty and hunger. The Sustainable Development Goals' integrative nature is, in theory, intended to address these interactions, but the complexity of the systems involved, our current level of knowledge, and the competing interests that come into play during goal formulation only serve to make this challenge more difficult. Consequently, monitoring, evaluation, and scientific assessment will be one of the most crucial direct government roles needed. In order to meet this criteria, governance systems must not only monitor progress but also provide chances for actors to learn about how to accomplish the objectives and the causal links that link them to results.

Normalizing Bases

The provision of a coherent and integrated vision for action on sustainable development is one of the Sustainable Development Goals' main goals. The 1992 Rio Declaration, the 2002 Johannesburg Plan of Implementation, and "The Future We Want," the outcome document of the 2012 UN Conference on Sustainable Development, are just a few examples of the extensive body of normative text negotiated over the last 30 years that is referenced in the preamble of the 2030 Agenda for Sustainable Development, which includes the Sustainable Development Goals. These texts might be mined, as Young and colleagues have done in this volume's, to discover the foundation for a "Grundnorm" that promotes a comprehensive strategy to combine a biophysical bottom line with global fairness. Yet, even if some may harbour the prospect of "creatively" expanding on the intentional ambiguity and inclusivity of the sustainable development idea in the future, it also works against the articulation of such an underlying norma- tive vision in the Sustainable Development Goals.

Without a new Grundnorm, there is a danger that the Sustainable Development Goals will obscure ongoing disagreements over this definition of sustainable development. These disagreements range from leftist complaints about marketization and the perceived commodification of nature to concerns from many developing country governments that any further movement towards recognising planetary boundaries will result in green protectionism and undermine economic growth. Thus, one finds in the Sustainable Development Goals a call for both "sustained" and "sustainable" economic growth and employment, but nowhere is there any mention of planetary boundaries, despite the fact that it was brought up during negotiations for a potential inclusion precisely in the "growth" goal. Comparably, although human rights are addressed in the preamble and sometimes in certain objectives in regard to particular goals like education or reproductive rights, they are not incorporated in the goals themselves. The Sustainable Development Goals also show a conflict between the three aspects of sustainable development's "balancing" and "integration". In such cases, governing institutions must find a way to capitalise on what is still a disputed normative vision in order to create learning and integrating processes that aim for more coherence.

Scope

Since specific goals or their components already fall under the purview of existing intergovernmental agencies or treaty bodies, which may oppose governance embedded in goal-setting at higher levels, squaring the mandate of the Sustainable Development Goals for integration with the broad agenda of sustainable development in practise presents an enormous governance challenge. Yet the Sustainable Development Goals are specifically designed to fight

siloization. The Sustainable Development Goals, however, are not able to accomplish all. In order to include the three components of sustainable development as well as its enabling circumstances, governance of the Sustainable Development Goals must be more comprehensive than the whole 2030 agenda. Similar to this, the call for a "focused" and "action-oriented" agenda resonates with the need for a central framing vision that the Sustainable Development Goals can provide, even though the High-Level Political Forum's mandate includes follow-up and review of implementation of "all the major UN conferences and summits in the economic, social, and environmental fields". With 17 goals covering everything from eradicating poverty, employment, and equity, to the sustainable use and protection of a wide range of resources and ecosystems, to addressing food security, water and sanitation, access to energy, and climate change, the Sustainable Development Goals in practise do little to alleviate this challenge. Focusing the agenda will be difficult given the underlying normative contestation expressed in some of the aims.

General Objectives and Conditions for Sustainable Development Goals Governance

In light of these difficulties, I contend that governance structures must prioritise the coherence and integration of the Sustainable Development Goals, strike a balance between the demand for high-level leadership and the "orchestra- tion" of action and resources at various levels and diverse mixtures of actors, and be accepted as legitimate by the community of actors working to achieve the SDGs.

Coherence

Coherence in global governance is often defined as the deliberate development of mutually reinforcing social policies. It consequently refers to the methodical promotion of mutually reinforcing policies across the three pillars of sustainable development internationally and at the national level. Both institutional and conceptual components make up this term. Coherence in an institution refers to how groups that pursue comparable objectives cooperate rather than compete with one another. The ability to analyse, plan, and resolve disputes across institutions should be possible. Coherence also requires interinstitutional collaboration to provide methods for assessing the effectiveness of overlapping policies, tracking the progress of shared commitments being implemented, and dealing with subpar or negative performance. Coherence, conceptually speaking, is the quality of institutional aims or ends reflecting a shared, laudable normative framework. This moral component is necessary for coherent governance because, in the absence of it, one may envisage perfectly institutionally consistent policies achieving undesired goals. Coherent governance should identify conflicts and trade-offs and provide solutions according on how dominant normative norms are. This concept is significant because it implies that coherence may be centralised or dispersed. Coherence does not exist in any specific institutions and is not mainly concerned with separating apart areas of conflicting capability and rivalry. Coherence is a result of the coordination of laws, regulations, and agreements among many aspects of global government.

The Sustainable Development Goals serve as the conceptual underpinning for institutional structures that may accommodate the realities of a complex and fragmented system in the case of the Sustainable Development Goals. Moreover, coherence does not entail universally applicable policies but rather acknowledges the "diversity of situations and problems within and across nations", a concept deeply ingrained in the Sustainable Development Goals. If Haas and Stevens

are correct that some goals lack normative consensus, then the question is whether governance arrangements can support the type of social learning that is so challenging in such situations, or if they should instead prioritise developing or applying new knowledge to learning processes and decision-making.

Orchestration

Orchestration is the most practical method for managing the Sustainable Development Goals due to the conditions of governance described above—a broad mandate requiring high-level political leadership, but institutional foundations that give limited direct authority over implementing actors and a lack of material resources. Here, I expressly use Abbott et al.'s definition of orchestration as a governance tactic that engages "intermediaries," or other players and organisations, to help lead and support the activities of the primary actors. The High-Level Political Forum has the additional difficulty of competing in a sector already packed with actors working on sustainable development. Thus, there must be a network of networked orchestrators that fosters coordination within a dispersed governance area. It will need at least high-level involvement, a strong review process centred on learning and improving implementation, a strong science-policy interface, and strong ties with "intermediaries" both within and outside the United Nations if it is to be successful. As a result, even though I concentrate largely on the High-Level Political Forum, it is but one node in a larger governance system, although an important one.

Thus, orchestration refers more to the common use of guiding or organisinglogically to generate desired effects than it does to the musical metaphor of the control an arranger has over the individual components of an orchestra. The orchestrator uses intermediates rather than trying to directly manage objectives, making orchestration a tactic of indirect governance. It stands in contrast to ways where governance agents actively interact with their ultimate policy goals, whether via obligatory, hierarchical regulation or cooperative methods like negotiated self-regulation. The Sustainable Development Goals can only be implemented provided the policy aims ofintermediaries are in line with, or at least roughly comparable to, those of the orchestrator since enlisting of intermediaries will be mostly voluntary in this situation. The orchestrator must deal with intermediaries via leadership, persuasion, and incentives since it lacks hard control, making orchestration a soft governance technique.

In the field of sustainable development, which has long embraced polycentricism, orchestration is not a novel concept. The 2002 World Summit on Sustainable Development was particularly notable for institutionalising public-private partnerships as a key strategy for implementation. In the meanwhile, networked, private, and non-starter forms of governance have become more common as a result of the international system's alleged flaws.

Legitimacy

Given that sustainable development is developing to become part of the UN's core mandate, legitimacy will be essential to a lead institution's capacity to effectively organise action on the Sustainable Development Goals. This may have wider consequences for the UN as a whole. The ability to orchestrate will heavily depend on early development of legitimacy vis-à-vis the UN Economic and Social Council, Bretton Woods Institutions, and the World Trade Organization. The Sustainable Development Goals can also play a role in legitimising those institutions to the extent that they are perceived to be pursuing policies and practises consistent with the goals.

Governance of the Sustainable Development Goals must be attentive to ownership, buy-in, and associated rights and participation problems, as well as to conditions and facilitators of implementation, including measures to foster commitment and capacity, in order to be legitimate and successful. To prevent any sense that the Sustainable Development Goals are top-down or forced, while still supporting and enabling progress on global objectives, governance of the SDGs must be particularly attentive to country diversity and procedures.

As a Lead Institution, the High-Level Political Forum on Sustainable Development

Attempts to integrate the three dimensions of sustainable development into global governance will necessitate high-level political leadership, according to a fundamental lesson learned from 20 years of experience with the UN Commission on Sustainable Development, tasked with the follow-up to the first Rio conference in 1992. Similar to how they did, earlier initiatives to integrate cross-cutting issues like gender into international organisations have shown how sectoral divisions must be broken down by an institutional champion. In that scenario, the merger of UN organisations working to advance gender equality into UN Women, under the political direction of the Commission on the Status of Women, has effectively promoted gender mainstreaming across the internal workings of UN organisations. UN Women also promotes effective accountability systems, such as reporting on mainstreaming in programme delivery and real development outcomes and performance metrics for UN country teams.

On the other hand, due to a lack of political leadership, interagency mechanism reforms, such as the establishment of the Chief Executives Board for Coordination and the UN Delivering as One initiative, have not made much progress in mainstreaming sustainable development. For instance, the Delivering as one pilot-phase report noted that there was a lack of coordination and consistency in the execution of environmental and development projects. In a similar vein, the Environmental Management Group, another coordinating entity, is still having trouble putting in place an UN-wide framework for environmental and social sustainability.

The new High-Level Political Forum was tasked to take on this leadership position by the 2012 UN Conference on Sustainable Development. It takes the place of the UN Commission on Sustainable Development, which was widely criticised for failing, despite some early victories, to transform talks into action and policy influence. These flaws resulted from its inability to draw non-environmental ministers and other senior policymakers, particularly from the economic and social sectors, and as a result of that, its strained relationships with financial, development, and trade institutions; its rigid sectoral agenda, which prevented it from addressing emerging challenges; and its constrained ability to monitor, review, or follow-up on decisions.

The High-Level Political Forum's mandate, in contrast, is ambitious and wide-ranging: setting the sustainable development agenda, including dealing with emerging issues; improving integration, coordination, and coherence across the UN system and at all levels of governance; monitoring and reviewing the status of the implementation of all Sustainable Development Goals and commitments; offering a platform for partnerships; and increasing participation of the "major groups" and other stakeholder groups. Each of these requirements would be challenging for any institution to meet on its own, but they are all crucial since the Sustainable Development Goals' integrative nature makes it impossible to readily choose one lead organisation for each objective.

The High-Level Political Forum, in the words of Secretary-General Ban Ki-moon during the forum's first meeting. While it has a lot of formal authority, it lacks the capacity to enforce its decisions or have direct control over the resources that will be used to carry them out. The High-Level Political Forum joins a crowded field of organisers already working to address the issues that specific Sustainable Development Goals are intended to address, including UN agencies, international financial institutions, organisations like the WTO, the Global Environment Facility, the Group of 20 major economies, and "action networks" like Every Woman Every Child and Sustainable Energy for All. In order to enhance coordination within a dispersed system without sparking unproductive turf wars or fostering notions of rivalry, it must be an orchestrator of orchestrators. As more direct or hierarchical governance modalities are mostly unavailable, the circumstances of lofty governance objectives but little governance capabilities, along with a crowded and fluid institutional context, are suitable for orchestration. Less favourably, the High-Level Political Forum also accords with the following orchestration study finding: States often start orchestration because it enables them to gain a minimal amount of governance, including limitations on their own conduct, without having to cede a lot of power or pay a lot for their sovereignty or material resources. States like orchestration, therefore, since it allows them to getoutcomes with subpar institutions.

Political Leadership at the Highest Levels: Legitimacy, Fecality, and Political Weight The High-Level Political Forum is an international organisation that meets every four years at the head of government level, yearly under the auspices of ECOSOC, and every year under the auspices of the UN General Assembly. The latter will make orchestration and coordination with UN organisations, regional commissions, and subsidiary bodies of ECOSOC easier. These connections, together with the High-level Political Forum's global membership, should give it a strong sense of legitimacy. In accordance with the guidelines set forth by the UN Commission on Sustainable Development, its mandate also includes high-level participation and the promotion of active participation by developing countries, the UN system, and other international organisations, as well as major groups and other stakeholders. A voluntary trust fund offers further assistance to stakeholders and developing nations.

These characteristics, particularly the hybrid structure that connects it to both the General Assembly and ECOSOC while subordinating it to neither, should also make the High-Level Political Forum a "focal," or a pioneer in the field of sustainable development policy. The UN Commission on Sustainable Development should be given less "political weight" than the High-Level Political Forum. The High-Level Political Forum is tasked with establishing the sustainable development agenda and including its three pillars. Moreover, its ministerial sessions comprise optional national evaluations and theme reviews of progress on the Sustainable Development Goals and overlap the high-level section of ECOSOC. The degree to which it can draw in high-level involvement will have an impact on its capacity to offer leadership, legitimacy, and access to levers of influence in national governments to mobilise pledges and resources.

The first two meetings of the High-level Political Forum met with notable convocation success, drawing heads of state and high-ranking officials from the ministries of finance, planning, children, housing, development, and foreign affairs, as well as the environment, and appearing to overcome the environmental bias that dogged the UN Commission on Sustainable Development's final years. The High-Level Political Forum's credibility and influence would

grow if it had a defined agenda centred on the Sustainable Development Goals, which would also make it easier for intermediaries to take action. As a result, their partnership is mutually beneficial.

If the High-level Political Forum is to have an impact on ECOSOC, the Development Cooperation Forum, and the UN Development Group, an interagency coordinating mechanism under the Chief Executives Board for Coordination, through which development-related programme delivery and implementation within the UN system is coordinated, it will be crucial to establish its validity and legitimacy early on. The impact of the High-Level Political Forum may then trickle down to certain coordination bodies like the UN Water, UN Energy, UN Oceans, or other interagency groups that may be required to meet particular Sustainable Development Goals. Similar to this, the High-Level Political Forum may serve as a platform for problem-solving, offering political guidance on interinstitutional deadlocks that impede the advancement of the Sustainable Development Goals.

Yet, concerns were expressed at the second High-Level Political Forum meeting over its autonomy and ability to define the agenda. The second High-level Political Forum's agenda was primarily set by the ECOSOC leadership due to the absence of an independent bureau and restrictions on stakeholder access. In addition, concerns about access were raised because, despite being mandated by the UN General Assembly to build on the more flexible participation rules of the UN Commission on Sustainable Development at the second High-level Political Forum, it is still unclear whether more restrictive ECOSOC rules apply when it meets under its auspices. Stakeholders cited the hybrid structure and "forum" status of the High-level Political Forum as well as its shorter meeting duration compared to the UN Commission on Sustainable Development as reasons for their connection to a broader fear that it would be weaker than its predecessor.

A joint ministerial declaration with the high-level segment of ECOSOC was also accepted by the High-level Political Forum as the meeting's result. This raises concerns about the High-level Political Forum's independence even if it can indicate a convergence of interests, which would be advantageous. In addition, the Group of 77 and China put the forum's decision-making skills to the test by putting out a suggestion on the required global sustainable development report. 4 The supporters of the plan withdrew it as a result of significant disagreements regarding the report's precise scope, rendering the forum's official decision-making power ineffective. As this was going on, its third meeting, held in 2015 under the auspices of ECOSOC, concentrated largely on its future function, but with a great deal of uncertainty since it took place during active talks on crucial post-2015 agenda items including funding, governance, and follow-up. As a result, it will probably be a few years before its ability to acquire financial success, political legitimacy, or weight can be assessed.

CHAPTER 15

SUSTAINABLE DEVELOPMENT GOALS IN THE FUTURE

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Due to the absence of an intergovernmental champion inside the United Nations, sustainable development mainstreaming has the potential to be taken up by the High-Level Political Forum thanks to its mission. By identifying integrative goals and targets, which can give content to current processes of mainstreaming that have lacked both a strong normative foundation and a political champion within the system, the Sustainable Development Goals can be used as an attempt to articulate what mainstreaming might look like. As a result, the High-Level Political Forum may, for instance, provide political weight to the development of a UN framework for environmental and social sustainability, which could be seen as a challenge to the framing or interpretation of the objectives of current agencies. Apart from supporting assessments and evaluations of efforts where integrating sustainable development is crucial but absent, the High-Level Political Forum may also invite the chairmen or staff of coordinating organisations to its sessions. In order to give political direction for the continued implementation of Delivering as One to include the Sustainable Development Goals, the High-Level Political Forum should forge a particularly close partnership with the UN Development Group5. Such guidelines could increase consistency, support national sustainable development planning and strategies, deliver technology support and capacity building more successfully, and administratively simplify or streamline the requirements of, and support for, implementing, multilateral environmental agreements and related commitments. The Sustainable Development Goals should be used to bring about coherence in partnerships and voluntary commitments. The High-Level Political Forum and associated review and monitoring responsibilities might contribute to preserving the normative coherence of the Sustainable Development Goals in the future. There is a need for more systematic efforts to promote coherence across the 2,110voluntary commitments and initiatives that are the most concrete means of implementation to come out of the 2012 UN Conference on Sustainable Development, even though integration of the three dimensions of sustainable development is already a driver of major thematic action networks.

Intermediaries: ECOSOC, Bretton Woods Institutions, and WTO

In order to promote integration and coherence, the High-Level Political Forum is specifically tasked with fostering relationships with and inviting participation from various organisations inside and beyond the UN system. Its intermediate role with ECOSOC is intricate yet essential. The monitoring of subsidiary organisations in the economic, social, environmental, and allied spheres continues to fall under the purview of ECOSOC, which is still "the principal mechanism for coordination of the operations of the United Nations system". While fluidity between the two organisations may limit the High-level Political Forum's autonomy, it may also enable the forum to benefit from ECOSOC's strengths in carrying out its own mission.

While it has had little impact on macroeconomic concerns, ECOSOC is now the political platform for policy consistency among the United Nations, the Bretton Woods institutions, and other economic organisations. With the inaugural funding for development conference in 2002, there has been a closer relationship and more involvement in joint meetings and projects, although the high-level discussions often show a UN/Bretton Woods gap. Whilst this too would rely on high-level involvement, the High-level Political Forum's capacity to draw business leaders might theoretically aid in bridging this gap. Leaders of the International Monetary Fund and the World Bank attended the High-Level Political Forum's first session under the UN General Assembly with success; its second meeting, however, was primarily attended by lower-level employees of financial institutions. Stronger indications from ECOSOC that meetings of the High-level Political Forum are crucial for coherence as its own combined meetings with the International Monetary Fund, World Bank, and WTO under the financing for development agenda may be necessary for greater convening success.

Although high-level political gatherings might be crucial for setting cooperation mandates, working relationships and orchestration among various institutions may also be fostered via coordinating organisations and collaborative efforts. For instance, the Millennium Development Goals, a subject of discussion at these meetings, had been agreed to more quickly by UN Secretary-General Ban Ki-moon and World Bank President Jim Yong Kim. The World Bank and UN Development Programme then collaborated to coordinate initiatives on particular objectives, which was made possible through discussions on cross-cutting problems at the Chief Executives Board for Coordination. With these procedures in place and political support, the Sustainable Development Goals should advance more swiftly than they did with the Millennium Development Goals. The UN General Assembly, which in turn gives specific direction to member agencies, may receive specific recommendations on sustainable development from the ECOSOC and the High-level Political Forum. Under its "quadrennial comprehensive policy review of UN operational actions for development" resolution, for instance, the UN development system is given a precise four-year coherence plan.

Connections to Regional Commissions

When it comes to planning meetings for High-Level Political Forum sessions, the relationship with regional commissioners should be "up," but it should be "down" when it comes to follow-up and evaluation. The main channel for promoting ties between reports, declarations, or other products of the High-Level Political Forum and regional and national decision-making on sustainable development policies and planning is likely to be regional commissions. They may also serve as the main venues for exchanging national perspectives and experiences, promoting regional research and activities, and contributing to High-Level Political Forum meetings. Regional commissions should also include their own independent national evaluations and progress updates on the SDGs.

Connections to Non-state Governing Bodies

The High-level Political Forum can facilitate learning forums, identify potential intermediaries in whatever form they occur, and then engage with, support, and report on their capacity to implement and scale up sustainable development, even though it will only be one node in connecting the world of business, partnerships, networks, and other implementing actors to the Sustainable Development Goals. As a result, it may provide a more comprehensive concept of

partnership than those advocated in the wake of the 2002 World Summit on Sustainable Development. It also may be less rigid and hierarchical. In order to strengthen the UN Commission on Sustainable Development, orchestration will be crucial in guiding pledges towards the Sustainable Development Goals. For instance, the High-Level Political Forum might assist the UN's voluntary accountability framework and improve monitoring and evaluation in various ways to gauge progress and encourage legitimacy and responsibility. Partnerships perform better when they have "specific and enforceable rules that are carefully monitored and enforced". The "Partnerships for SDGs" platform, which can be accessed online, offers a potential foundation for supporting these tasks. For successful support, monitoring, cooperation, and direction, it must be kept current with continual input from stakeholders and actively linked to other commitments and registries. The UN Global Compact and other private sector-focused UN programmes might collaborate with the High-Level Political Forum. This strategy would promote governance innovation more effectively and further acknowledge the polycentric character of sustainable development governance.

Direct Governance Activities: Monitoring, Review, and Science

The Millennium Development Goals have taught us an important lesson: responsibility must be ensured, learning must be facilitated, and implementation procedures must remain under pressure. The most difficult direct governance processes needed to achieve the Sustainable Development Goals are these instruments.

Monitoring Development and the Interaction of Science and Policy

A Global Sustainable Development Report is one of the major components that the High-Level Political Forum has been required by governments to develop to enhance the science-policy link. The report should ideally be future-focused and policy-oriented, highlighting both areas of accomplishment and giving evidence-based assessments of policy shortcomings and gaps. Analyses linking the causes of sustainable development to their effects should also be developed, showing how interventions and other uncertainties interact with causes to produce sustainable pathways.

Fulfilling these objectives presents a number of scientific and technological difficulties. The various determinants of sustainability, interactions, and connections, for instance, make it challenging to design sustainability measurements and indicators for Sustainable Development Goals goals. Hence, research on sustainability scenarios that focuses on drivers and their interplay with socioeconomic-governance aspects, rather than only material indicators, should also be encouraged. Also, not all drivers are simple to measure. Although fragility, security, and vulnerability may not be measurable in the same way that output, consumption, and population are, they could also need a lot of data. Despite substantial advancements in measurement, there may be problems with scientific and ethical presumptions regarding the links between the environment, the natural resource base, climate change, biodiversity loss, and hunger and poverty. For instance, the ideal connection between, say, population, economic development, and natural resources may be influenced by political and moral judgements. Lessons acquired through national and UN agency implementation evaluations may be a significant contribution in this respect, not only in terms of producing data but also in terms of enhancing policies and monitoring. In order for measurements and monitoring to be seen as helpful and constructive

rather than top-down and punitive, such procedures should also include possibilities for stakeholder participation in addition to scientific direction.

These difficulties also suggest that monitoring of the Sustainable Development Goals should be systemic, sensitive to signals of systemic transition, linkages among various system components or processes, linkages across distances, and linkages among stakeholders to understand their various interests and viewpoints. For instance, stress testing that are similar to those used by financial organisations may be encouraged. Single businesses won't be able to afford such monitoring, therefore systems must be set up to get data from many sources, combine it, and then arrange it in a way that encourages learning and is flexible enough to accommodate reciprocal adjustment.

Administratively, the UN Statistical Commission serves as the focal point for statistics within the UN system and offers guidance and recommendations on measuring targets and indicators. However, the UNDP, as it did for the Millennium Development Goals, can offer the institutional link to national-level monitoring and reporting on the Sustainable Development Goals, which emphasises the value of national ownership. This governance structure also suggests that national and global monitoring may have distinct goals: national action is driven by ownership, policy creation, and empowerment in UN procedures, while global monitoring attempts to produce comparability.

It may also be possible to identify knowledge gaps and the interplay between sustainability challenges by using science panels, particularly a body or bodies that concentrate on synergies and integrating knowledge across sectors, as well as by providing early warnings of developing sustainability threats. The intended formation of an "Independent Group ofScientists to produce the quadrennial Global Sustainable Development Report" is a move in this direction. This group will provide information to the High-level Political Forum when it convenes under the UN General Assembly every four years. Enhancing the science-policy interface necessitates social scientific studies of policy interventions and instruments, such as those that relate implementation methods like trade, finance, and technology to advancements in sustainable development. Creating scenarios, or "storylines," that connect causes to effects while accounting for uncertainties may help uncover potential paths towards sustainable development and the interactions between those routes and potential policy responses.

Summaries of past reviews and accountability reports of alliances, benevolent commitments, and sustainable development action networks may also be included in the Global Sustainable Development Report. This is in line with the report's directive to minimise duplication with other initiatives while basing its conclusions on "information and analyses" of sustainable development. Networks like Every Woman Every Child, for instance, already have many accountability systems that report on funding and outcomes. Given the enormous range and complexity of partnership and voluntary commitments, compiling important results and links to complete reports in one location might not only promote openness and accountability but also allow rapid and thorough access to models of reporting and review.

Review on Sustainable Development Goals Progress

A draught UN resolutionhad been drafted as of the time of writing and offers an all-encompassing strategy for reviews conducted under the auspices of the High-level Political Forum and ECOSOC. It indicates an agreement that review, monitoring, and accountability must

be a part of a bigger framework and not only be concentrated on national presentations and reviews and the High-level Political Forum, even if it still gives some room for flexibility in how reviews will be conducted. The author's participant observation at two UN workshops sponsored by a seven-state consortium in 2014 to design the High-level Political Forum review mechanism shows that some developing countries may resist significant strengthening of country-level review processes or deeper engagement of civil society. In a larger system, the state-led mutual evaluation of national sustainable development progress and goals should only be one node. Such studies might compile data from earlier reviews and utilise national sustainable development strategies as a starting point. As was already said, lessons learned from the Annual Ministerial Review point to the need of creating rewards and support for participation, emphasising learning opportunities, and directing demands for rectification, cogent action, and methods of execution when gaps are found. If new information becomes available, the High-Level Political Forum sessions held in conjunction with the UN General Assembly every four years may potentially provide a chance to explore updating or changing the objectives and indicators for the Sustainable Development Goals.

Moreover, the High-Level Political Forum is in a unique position to provide evaluation, accountability, and learning for action networks, partnerships, and voluntary pledges. For instance, it may promote impartial third-party evaluations, which would be made possible by newly developed tools and platforms both within and outside the UN system. To build these norms and reliable platforms, however, will need some technical and material assistance as well as active encouragement, particularly to make it easier for stakeholders from emerging nations and more marginalised significant groups to participate.

Advancement towards the Sustainable Development Goals will need ongoing entrepreneurship and dependable, predictable resource mobilisation. When regional organisations and commissions, nations, provinces, and municipalities provide and receive technical and scientific inputs and assistance to guide stakeholder involvement and activities in sustainable development on different governance levels, the implementation of objectives may be improved. Throughout supply chains in the marketplace, partnerships, action networks, and international actors—including non-state sustainability standard-setters—will also be important participants. The majority of the financial and other resources used to date to implement the Sustainable Development Goals are voluntary commitments made at and after the 2012 UN Conference on Sustainable Development; however, it goes without saying that countries' own domestic resource mobilisation and policy commitments will be equally important. Similar to how the Muskoka Summit of the Group of Eight major economies established the Muskoka Initiative for Maternal, Newborn, and Child Health, which is anticipated to mobilise more than US$10 billion, the High-Level Political Forum may likewise support new initiatives. Nevertheless, the US$636 billion number mentioned for these promises beyond 2012 does not distinguish between old and new commitments, nor is there currently a system in place to hold people accountable for making sure the commitments align with the Sustainable Development Goals.

Previous experiences with partnerships related to the Millennium Development Goals and sustainable development in general demonstrate that these partnerships' uneven effectiveness was influenced by a lack of institutionalised review mechanisms and clear, quantifiable benchmarks to measure performance.

However, the Sustainable Development Goals cannot be properly carried out without the support of the government, long-term investments, and new financing sources. In order to combat poverty and other global issues, official development assistance from OECD countries and new non-Western donors is crucial. However, there will need to be a greater reliance on private sector investments, non-governmental organisation and foundation support, and domestic resource mobilisation. Yet, money has to be directed into infrastructure development, low-carbon technology, and sustainable development in general. Although though they are often "beyond the investment boundaries" of many long-term investors due to their high risk-reward ratios and lengthy time periods, investments in inclusive development must be undertaken.
