

INFRASTRUCTURE
Underpinning Sustainable Development

ITRC mistral

Environmental Change Institute eci University of Oxford

UNOPS

© UNOPS 2018

All rights reserved. The reproduction of any materials from this publication must be accompanied by a full citation.

The views expressed in this publication are those of the authors and do not necessarily reflect those of the United Nations.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of UNOPS concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

All reasonable precautions have been taken by UNOPS to verify the information contained in this publication. However, the published material is being distributed without warranty of any kind, either expressed or implied. The responsibility for the interpretation and use of the material lies with the reader. In no event shall UNOPS be liable for damages arising from its use.

This report may be cited as follows:
Thacker S, Adshead D, Morgan G, Crosskey S, Bajpai A, Ceppi P, Hall JW & O'Regan N. Infrastructure: Underpinning Sustainable Development. UNOPS, Copenhagen, Denmark.

For more information:

UNOPS
Website: www.unops.org

Infrastructure Transitions Research Consortium (ITRC)
Website: www.itrc.org.uk

TABLE OF CONTENTS

1
Preface

2
Foreword

3
Infrastructure and the Sustainable Development Goals

6
SDG 1- 17: Explanations and Examples

7
SDG 1: End poverty in all its forms everywhere
Project: Investment in Homes to Reduce Poverty

9
SDG 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture
Project: Agricultural Sector Recovery

11
SDG 3: Ensure healthy lives and promote well-being for all at all ages
Project: Maternal and Neonatal Health

13
SDG 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Project: Serbian Schools Reconstruction

15
SDG 5: Achieve gender equality and empower all women and girls
Project: Housing Reconstruction in Humanitarian Crisis

17
SDG 6: Ensure availability and sustainable management of water and sanitation for all
Project: Urban Water Supply

19
SDG 7: Ensure access to affordable, reliable, sustainable and modern energy for all
Project: Rural Renewable Energy

21
SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Project: Rural Access Improvement

23
SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
Project: Local Market Reconstruction

25
SDG 10: Reduce inequality within and among countries
Project: 16/6 Neighbourhood Reconstruction

27
SDG 11: Make cities and human settlements inclusive, safe, resilient and sustainable
Project: Rehabilitation of Riverton Road

29
SDG 12: Ensure sustainable consumption and production patterns
Project: Climate Communication Centre

31
SDG 13: Take urgent action to combat climate change and its impacts
Project: Resilient Infrastructure for Climate Change

33
SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development
Project: Waste Management Programme

35
SDG 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
Project: Wastewater Management

37
SDG 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable, and inclusive institutions at all levels
Project: Construction of High Security Prison

39
SDG 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development
Project: IDP Information Centre

41
Influences across all Sustainable Development Goals

42
UNOPS and the Sustainable Development Goals

43
Infrastructure for Sustainable Development

44
References

PREFACE

This report was produced as part of a collaborative partnership between UNOPS and the University of Oxford-led Infrastructure Transitions Research Consortium (ITRC). Through a systematic evaluation process, it presents and explains the ability for infrastructure to influence all 17 of the Sustainable Development Goals (SDGs), including almost all of their targets. Accompanying these explanations is a rich set of examples that show how infrastructure projects, implemented by UNOPS and its partners, are helping to advance the 2030 Agenda in a variety of countries and contexts around the world. In doing so, it provides new and important evidence that highlights the central role of infrastructure in achieving the SDGs and in underpinning sustainable development.

FOREWORD



Ms. Grete Faremo

Under-Secretary-General and UNOPS Executive Director

The Sustainable Development Goals (SDGs) adopted by the UN Member States in 2015 provide a global framework for long-term sustainable development. National resources will be key to achieving a more sustainable future for all. The UN stands ready to support.

With an explicit mandate within the UN to implement infrastructure, UNOPS is committed to helping countries gain a better understanding of how their infrastructure planning, delivery and management practices compare to recognized global best practice, and how they could improve.

Infrastructure, in particular, underpins all of the SDGs. It plays a critical role in society because it can influence development far into the future — both positively and negatively. This is why it is vital to understand the influence that infrastructure systems have on the SDGs.

And that's exactly what 'Infrastructure: Underpinning Sustainable Development' does: It identifies and describes the key links between infrastructure and SDG targets.

Developed in collaboration with the Infrastructure Transitions Research Consortium (ITRC) — led by the University of Oxford, this publication provides crucial evidence to inform the decision-making process of governments, helping to ensure that investments made in infrastructure provide the long-term benefits necessary for nations' development.

We are proud to present this report together with Oxford/ITRC, and to reaffirm our commitment to helping people build better lives and countries achieve peace and sustainable development.



Professor Jim W Hall FREng

Professor of Climate and Environmental Risk, University of Oxford

Infrastructure is fundamental to sustainable development and, as this publication demonstrates, achieving the Sustainable Development Goals depends on the right quantity and quality of infrastructure services being provided for all people.

This report describes joint work between UNOPS and the research consortium that I lead in the UK, the Infrastructure Transitions Research Consortium. For the last eight years, the ITRC has been developing methodology for long term assessment and planning of infrastructure systems.

Though our research started from a sustainability perspective, in particular the central role that infrastructure has in climate change mitigation and adaptation, our work has attracted growing attention from finance ministries and infrastructure units that tend to be focused on the role of infrastructure in economic growth and productivity. In that sense, infrastructure can be a 'Trojan horse' that brings sustainability considerations within the purview of the economic imperatives of most governments.

The collaboration between ITRC and UNOPS has been a very productive one, with UNOPS bringing us new challenges from very diverse contexts around the world and opportunities for our work to have an impact on the ground, which is what motivates my team. This report provides a next important step in that journey.

INFRASTRUCTURE AND THE SUSTAINABLE DEVELOPMENT GOALS

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.[1] Over the past four decades, the concept of sustainable development has become an increasingly central theme of nation states and their citizens. Amongst others, the Sustainable Development Goals (SDGs) – as part of the 2030 Agenda for Sustainable Development[2] – demonstrate high-level international commitments in this area, on the part of governments, international organizations, business and civil society.

By providing and supporting essential services, networked infrastructure systems, such as energy, transportation, water, waste management and digital communications form the backbone of modern society. As well as providing for people in their homes, the services from these infrastructure systems support other non-networked infrastructure systems that are critical for the functioning of society. Non-networked systems are comprised mainly of a single asset type, a building or a facility, which supports the delivery of a service. These include hospitals, schools, industrial facilities, community centres and government buildings. However, no infrastructure system exists in isolation. Interdependencies between the assets, institutions and knowledge that make up an infrastructure system mean that infrastructure must be considered as a system of interacting systems: a 'system-of-systems'.[3]

Networked infrastructure is explicitly mentioned in SDG: 9 (Industry, innovation and infrastructure) and at the sectoral level in SDG 6 (Clean water and sanitation) and SDG 7 (Affordable and clean energy). The services delivered by non-networked infrastructure feature more prevalently across numerous SDGs and dimensions of development, including education, healthcare and the rule of law. **Figure 1** provides a graphic representation of how infrastructure forms a central component of the SDGs – underpinning sustainable development.

Despite the intuitive connections between infrastructure and sustainable development, the true influence of infrastructure remains underexplored in theory and underexploited in practice. It is with this potential in mind that this study has been developed. First and foremost, this study explains the specific influences that infrastructure, both networked and non-networked, has on the SDGs. These influences are supported by concrete examples of how infrastructure is contributing towards sustainable development in practice – helping to advance the 2030 Agenda.



Figure 1: Infrastructure underpinning sustainable development: Networked systems providing the basic services essential for the functioning of non-networked systems and how they both influence the SDGs.

Influences are identified between networked and non-networked infrastructure and the 169 targets of the SDGs. An influence is characterised where published evidence is available to substantiate that the achievement of the target will be enhanced through the provision of improved infrastructure services that the infrastructure delivers.[4] It is expected that this classification will be updated in the future, as new evidence can be attributed across an increasing number of infrastructure sectors. **Figure 2** provides a graphical representation of the methodology used for the classification of influences, including a specific example for the 7 targets of SDG 1: No poverty. The specific influences related to target 1.3 are highlighted in the figure. The achievement of target 1.3, to implement nationally appropriate social protection systems and measures for all, is enhanced by implementing effective information management systems (digital communications) with data collection aided by access to all communities (transport). Improvements to non-networked infrastructure such as government buildings, which are responsible for managing social protection systems, can also enhance the achievement of this target.

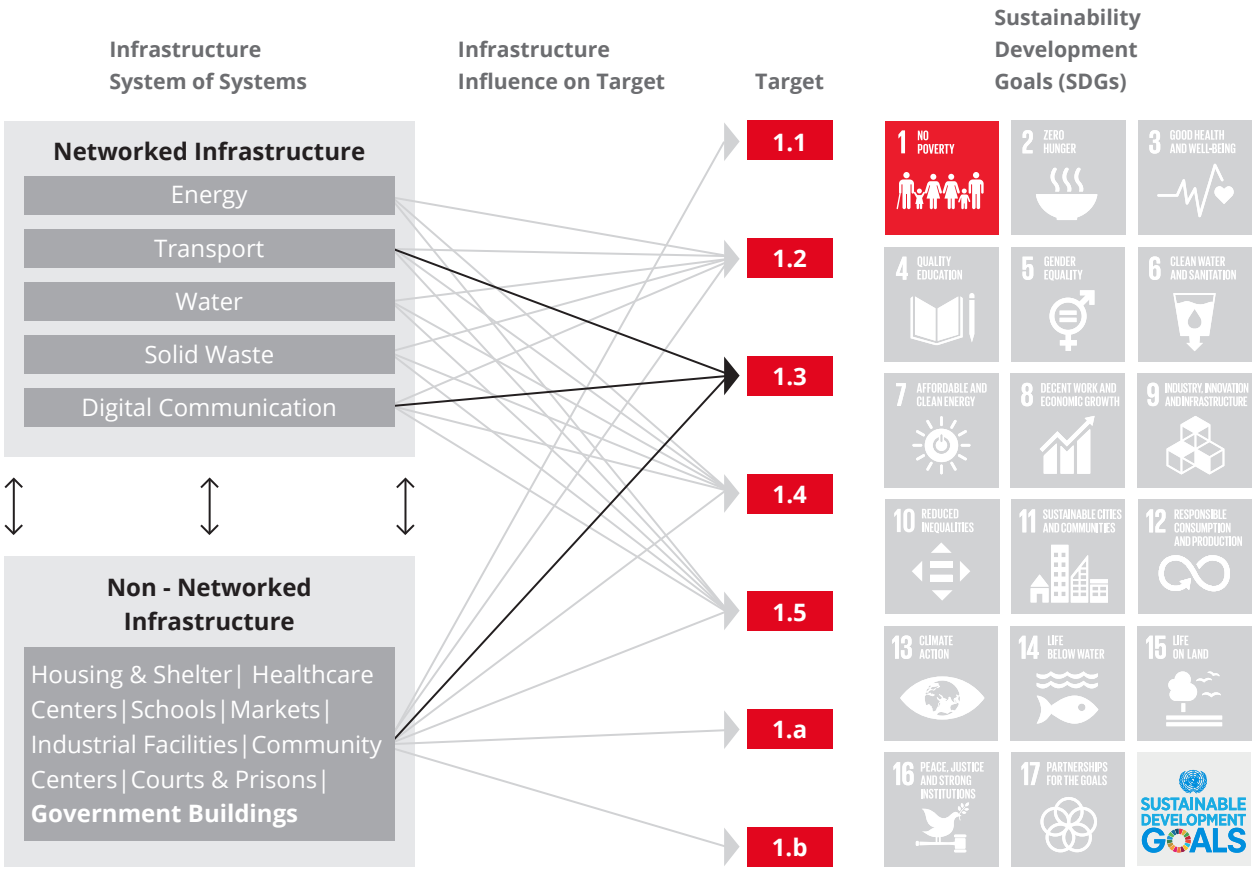


Figure 2: Graphical representation of the influence of networked and non-networked infrastructure on the targets of SDG 1. The specific influences related to Target 1.3 are highlighted in black.

SDG 1-17 EXPLANATIONS AND EXAMPLES

This report provides a description of each SDG and an explanation of how it is influenced by infrastructure as a system-of-systems. The inclusion of individual UNOPS projects for each SDG demonstrates the specific contributions that each project makes towards the targets of the SDGs. In addition to the influences made by infrastructure, additional project-specific influences on targets are shown through the use of dashed lines. These findings are summarized across all SDGs and highlight the influence that infrastructure has on supporting global development objectives. The presentation of this evidence highlights the work of UNOPS and its partners in contributing to sustainable development in a range of countries and contexts around the world.



SDG 1: END POVERTY IN ALL FORMS EVERYWHERE

Goal 1 commits to ending poverty in all its manifestations, including its most extreme forms, over the next 15 years, and resolves that all people, everywhere, should enjoy a basic standard of living. This includes social protection benefits for the poor and most vulnerable and ensuring that people harmed by conflict and natural hazards receive adequate support, including access to basic services.

The multi-dimensional definition of poverty extends beyond a measure of financial income and is characterized by severe deprivation of all basic human needs.[5] Infrastructure can address poverty reduction by providing a range of basic services at the household level, including fuel for heating, lighting and cooking, water for drinking and sanitation, and adequate disposal of waste. Building networks of infrastructure will facilitate the provision of these services directly to households and communities in need. In rural or remote areas, improved transportation networks and digital communications can provide access to these services, supplying residents with vital goods and information and linking them to facilities such as schools or hospitals.

Access is key to improving resilience in the face of extreme climatic events, or in the case of war and conflict. The sustained provision of services such as electricity, water and waste disposal will ensure that communities have the means to recover swiftly from social or environmental shocks without falling back into poverty.[6] The establishment of social protection systems for the poor can also improve resilience. This requires information management systems that are most effectively implemented through digital means.[7]

SDG 1 targets with infrastructure influence		Linkages to infrastructure sector
1.1	By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day	
1.2	By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions	
1.3	Implement nationally appropriate social protection systems and measures for all, including floors, and by 2030 achieve substantial coverage of the poor and the vulnerable	
1.4	By 2030, ensure that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including microfinance	
1.5	By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters	



©UNOPS/John Rae

PROJECT: INVESTMENT IN HOMES TO REDUCE POVERTY

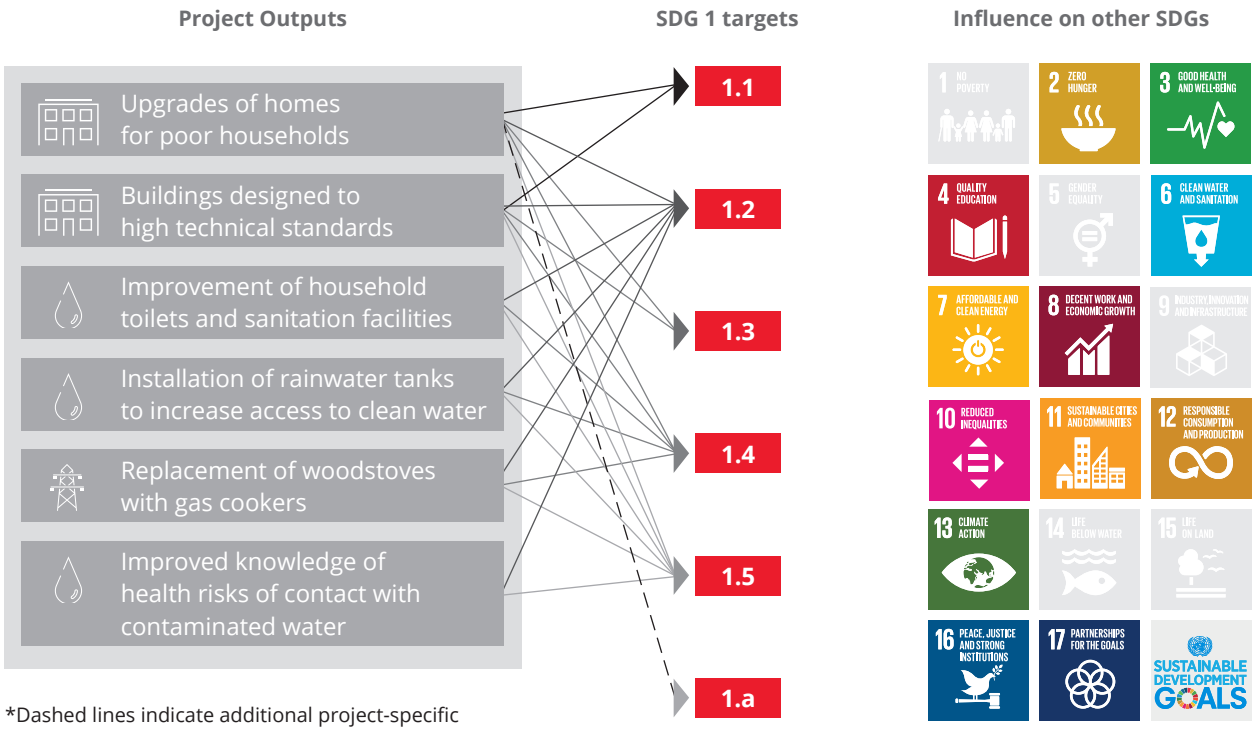
Location: Colombia | **Duration:** 2016 - Ongoing | **Partners:** Government of Colombia

Project Description

The "50,000 Homes" project is a national initiative of the Government of Colombia. UNOPS is an implementing partner, tasked with upgrading around 3,500 individual homes for approximately 20,000 individuals across the country. The aim of the project is to improve homes based on the needs of each family, incrementally raising the standards of living across communities.

Local governments work with communities to identify families who are most in need of help. Families who meet the criteria receive approximately $3,000 each to improve their homes. UNOPS engineers work with social workers and the individual family to design specific plans to upgrade their home. Each individual plan reflects the family's needs, social priorities in the home or community, and the best architectural options. Common improvements include the redesign of the kitchen, bathroom, roof, floor or the addition of an extension. These upgrades contribute to improving the health of residents through more hygienic spaces to prepare food and access to clean water and sanitation. Upgrades to kitchens and the creative use of the extensions have the added benefit of providing economic opportunities to support the efforts of families climbing out of poverty.

Influence of project outputs on SDG 1 targets and other SDGs



*Dashed lines indicate additional project-specific influences on targets beyond the infrastructure sector-based classification outlined in the methodology.



SDG 2: END HUNGER, ACHIEVE FOOD SECURITY AND IMPROVED NUTRITION AND PROMOTE SUSTAINABLE AGRICULTURE

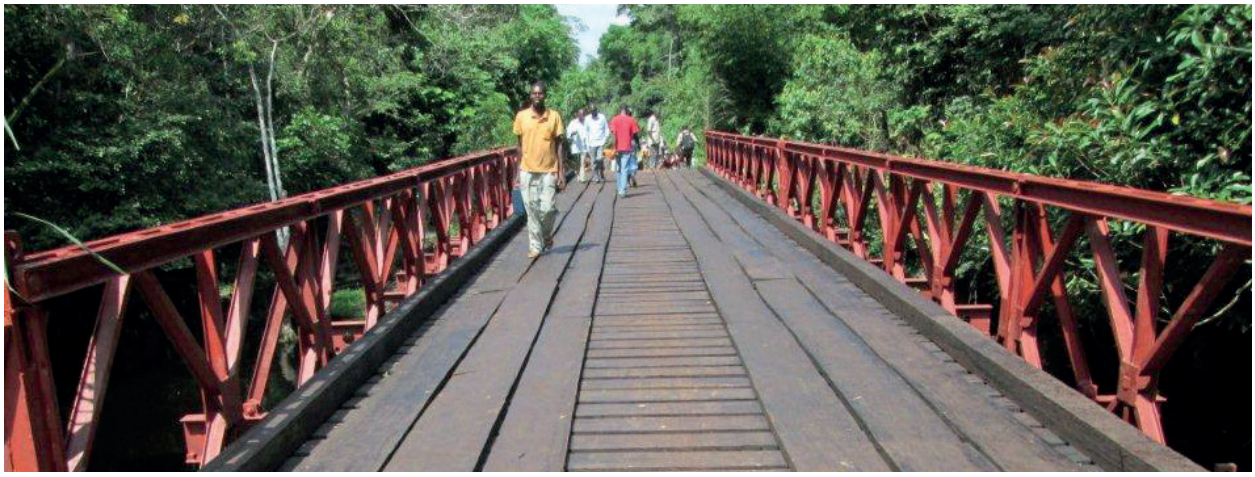
Goal 2 seeks sustainable solutions to end hunger in all its forms by 2030 and to achieve food security, aiming to ensure that everyone everywhere has enough good-quality food to lead a healthy life. Achieving this Goal will require better access to food and the widespread promotion of sustainable agriculture.

Ending hunger through sustainable food systems should account for each step in the chain of food production and consumption within a systems context: growing, processing, distribution, preparation, consumption and disposal of wastes. Through infrastructure contributions in all sectors, the secure provision of food and nutrition can be assured for all segments of society.

Improved water supply and irrigation techniques are key to enhancing agricultural resilience to drought and maintaining food supply, while agricultural land use management can improve resilience to flooding. Modern energy infrastructure plays a key role in providing efficiency to the production process: electrification of food processing can increase productivity through automation,[8] while refrigeration can contribute toward the reduction of food waste and enhance food quality and freshness. The construction of warehouses and other storage facilities help to manage the food production process and reduce waste throughout the supply chain.

More efficient transportation that links producers and consumers will increase the sustainability of the food system and increase the variety of food options available to consumers. Digital communications can play a larger role in food distribution, as producers gain access to market information both domestically and internationally,[9] and provides farmers with the knowledge necessary to improve agricultural techniques.[10]

SDG 2 targets with infrastructure influence		Linkages to infrastructure sector
2.1	By 2030, end hunger and ensure access by all people, in particular the poor and people in vulnerable situations, including infants, to safe, nutritious and sufficient food all year round	
2.2	By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons	
2.3	By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment	
2.4	By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality	
2.5	By 2020, maintain the genetic diversity of seeds, cultivated plants and farmed and domesticated animals and their related wild species, including through soundly managed and diversified seed and plant banks at the national, regional and international levels, and promote access to and fair and equitable sharing of benefits arising from the utilization of genetic resources and associated traditional knowledge, as internationally agreed	
2.a	Increase investment, including through enhanced international cooperation, in rural infrastructure, agricultural research and extension services, technology development and plant and livestock gene banks in order to enhance agricultural productive capacity in developing countries, in particular least developed countries	
2.c	Adopt measures to ensure the proper functioning of food commodity markets and their derivatives and facilitate timely access to market information, including on food reserves, in order to help limit extreme food price volatility	



©UNOPS

PROJECT: AGRICULTURAL SECTOR RECOVERY

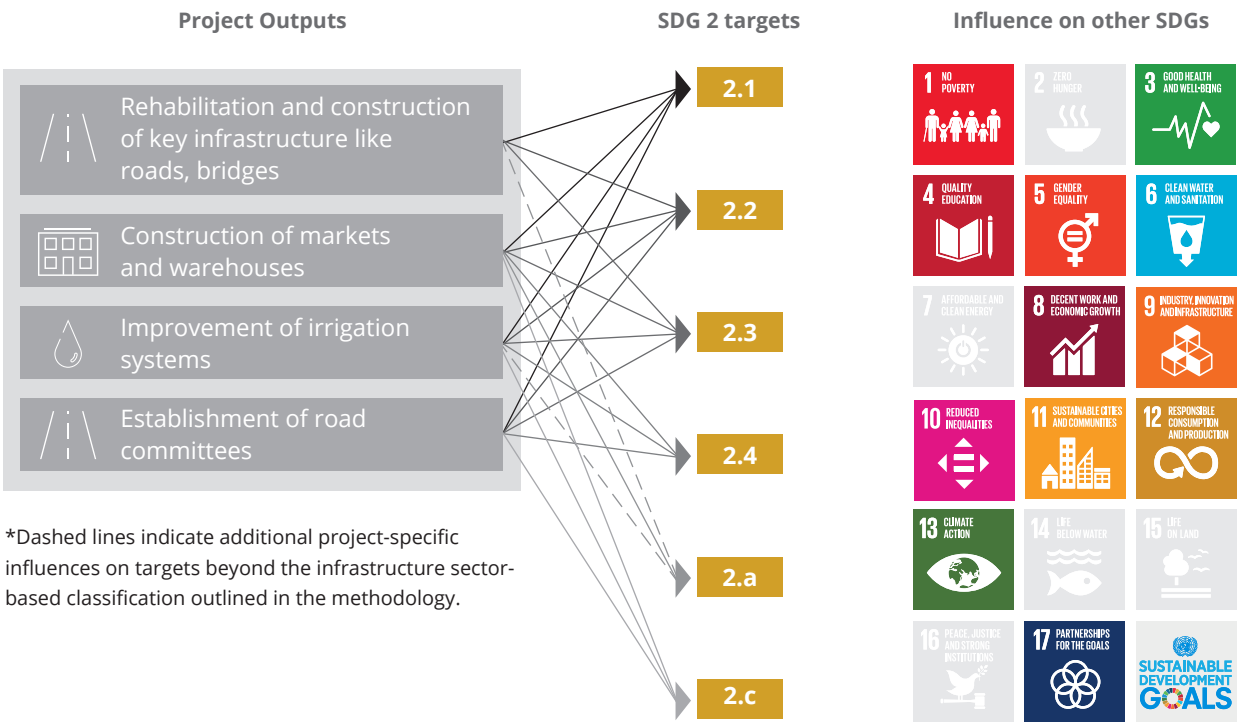
Location: DR Congo | **Duration:** 2011 - 2015 | **Partners:** European Union

Project Description

UNOPS built and rehabilitated 2,500 km of roads, 12 bridges, 20 markets, 20 warehouses, and improved irrigation systems in three remote provinces in North-West DR Congo. The aims of the project were to boost agricultural recovery and provide access to markets for 340,000 people living on isolated farms.

To improve the long-term sustainability of the project UNOPS established 21 road maintenance committees and supported the creation of a farmers federation with 1,000 members, 400 of them women, by bringing together 30 existing farmers organizations. The new infrastructure, specifically the 130 km road between the towns of Boende and Monkoto, reduced travel time by 10 times and the price of local staples such as rice and peanuts by half. The construction of the road also created 110,000 days of paid work for local people.

Influence of project outputs on SDG 2 targets and other SDGs



*Dashed lines indicate additional project-specific influences on targets beyond the infrastructure sector-based classification outlined in the methodology.



SDG 3: ENSURE HEALTHY LIVES AND PROMOTE WELL-BEING FOR ALL AT ALL AGES

Goal 3 seeks to ensure health and well-being for all by improving reproductive, maternal and child health, ending disease epidemics, and ensuring health coverage and access to safe, affordable and effective medicines and vaccines. Towards that end, world leaders committed to support research and development, increase health financing, and strengthen the capacity of all countries to reduce and manage health risks.

Most of the world's population, particularly in rapidly growing urban areas, will increasingly benefit from access to health services provided in hospitals and clinics, while universities and other educational establishments support medical research, development and training. These facilities require reliable networks of energy,[11] water and digital communications infrastructure, which, together, provide the necessary conditions for the functioning of advanced medical equipment and technology. Sanitation services through clean water provision and waste disposal can limit the spread of diseases, including neglected tropical diseases scheduled for elimination by the WHO, and have been found to greatly decrease the incidence of maternal, neonatal and child mortality by reducing the spread of water-borne pathogens.[12]

Where access to these facilities is not possible, such as in rural or remote communities, transportation networks are crucial to the provision of health services, including prevention through education and public awareness. In an increasingly connected world, information and communication technologies can provide access to health services by facilitating the sharing of knowledge, records and results and assisting in self-management of medical conditions, including addiction.[13] Digital communications infrastructure can provide an array of additional health-related benefits to society, including the recruitment and training of the health workforce and the timely dissemination of information to reduce health risks from natural disasters.

SDG 3 targets with infrastructure influence		Linkages to infrastructure sector
3.1	By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births	
3.2	End preventable deaths of newborns and children under-5, reduce neonatal mortality to as low as 12 per 1,000 live births and under-5 mortality to as low as 25 per 1,000 live births	
3.3	By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases and other communicable diseases	
3.4	By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being	
3.5	Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol	
3.6	By 2020, halve the number of global deaths and injuries from road traffic accidents	
3.7	By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes	
3.8	Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all	
3.9	By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination	
3.a	Strengthen the implementation of the World Health Organization Framework Convention on Tobacco Control in all countries, as appropriate	
3.b	Support the research and development of vaccines and medicines for the communicable and non-communicable diseases that primarily affect developing countries, provide access to affordable essential medicines and vaccines	
3.c	Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries	
3.d	Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks	

*The wording of the targets in the above table has been simplified due to space constraints.



©UNOPS/John Rae

PROJECT: MATERNAL AND NEONATAL HEALTH

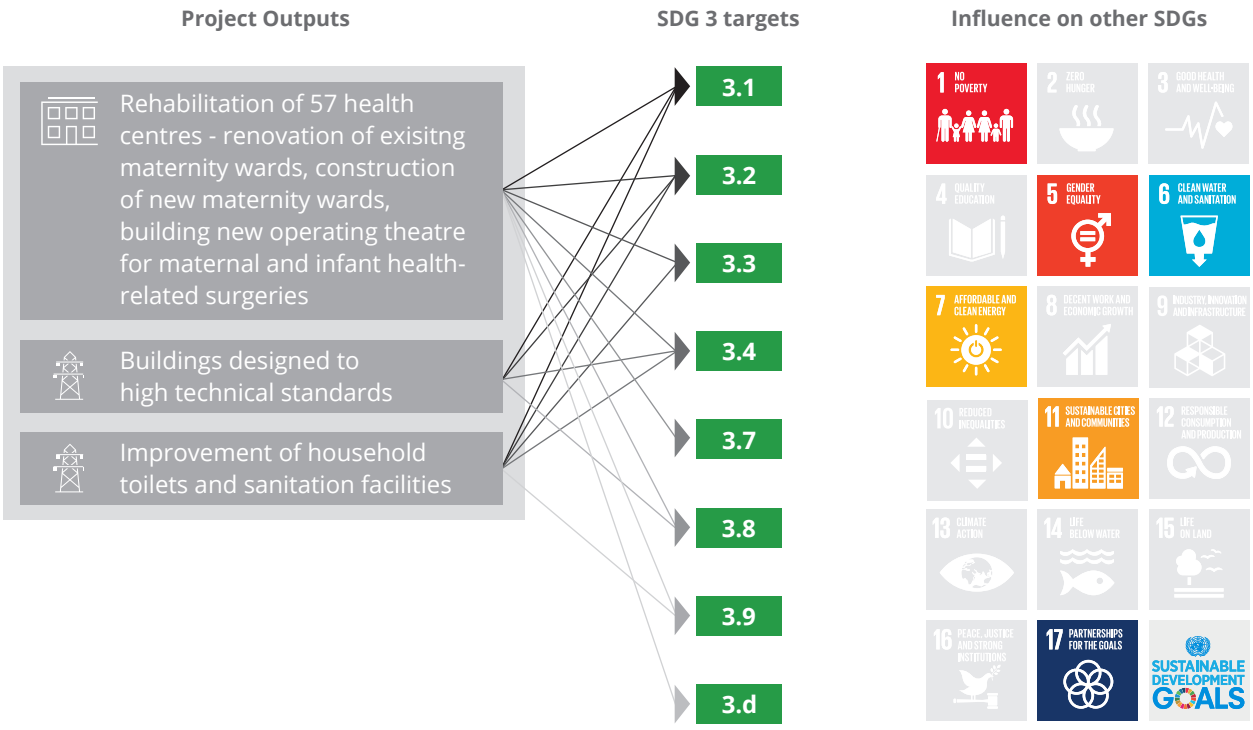
Location: Kenya | **Duration:** 2015 - 2018 | **Partners:** UN Children's Fund (UNICEF), UK Aid (DFID)

Project Description

UNOPS strengthened maternal and child healthcare across five counties in Kenya with the aim of reducing maternal mortality and neonatal deaths. The project involved upgrading the healthcare infrastructure, carrying out assessments of facilities and training of health workers. UNOPS assessed 98 health facilities, and as a result 31 maternity units were rehabilitated, 11 maternity units were newly constructed, and 9 operating theatres were built.

The health facilities were rehabilitated incorporating a range of green technology retrofits and solar powered solutions, designed to enable the off-grid facility to be fully functional on solar energy, minimize electricity usage, and provide access to water services. Close to 500 days of training were provided to community volunteers and health workers, with more than 14,000 people trained.
The health care centres stand to benefit an estimated 1.6 million people with access to improved healthcare facilities across the five counties: Garissa, Homa Bay, Kakamega, Nairobi and Turkana.

Influence of project outputs on SDG 3 targets and other SDGs





SDG 4: ENSURE INCLUSIVE AND EQUITABLE QUALITY EDUCATION AND PROMOTE LIFELONG LEARNING OPPORTUNITIES FOR ALL

Goal 4 aims to ensure that all people have access to quality education and lifelong learning opportunities, focusing on the acquisition of foundational and higher-order skills at all stages of education and development; greater and more equitable access to quality education at all levels as well as technical and vocational education and training; and the knowledge, skills and values needed to function well and contribute to society.

In addition to classrooms, desks and learning materials, educational facilities such as schools, colleges and universities require a range of infrastructure services to provide quality learning opportunities and skills development. The performance of students and pupils can be greatly enhanced through the provision of electricity for heating and lighting, water and sanitation facilities, and, importantly, access to digital infrastructure such as computers and the internet.[14]

As well as increasing the knowledge capacity of society as a whole, internet access provides teachers with a range of educational materials that can be accessed online or downloaded, and likewise used to improve instructors' skills and teaching methods. Access to ICT infrastructure at all levels of schooling fosters digital skill development, which is increasingly important for employment and entrepreneurship opportunities.[15] Youth and adults who have relevant skills face better prospects in job markets that increasingly value technical or vocational proficiency. Digital communications can also provide access to learning for young people in villages or rural communities who are unable to travel far from home. The availability of suitable transportation can fulfil a similar purpose, enabling students to progress to higher education in another city or region. Many young children, especially girls, are assigned domestic responsibilities such as the collection of drinking water or firewood, leaving them no time to attend school. Modern and accessible energy and water infrastructure can thus provide time savings for families and help ensure all children have the chance to pursue their education.

SDG 4 targets with infrastructure influence		Linkages to infrastructure sector
4.1	By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes	
4.2	By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education	
4.3	By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university	
4.4	By 2030, substantially increase the number of youth and adults who have relevant skills, for employment, decent jobs and entrepreneurship	
4.5	By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations	
4.6	By 2030, ensure that all youth and a substantial proportion of adults achieve literacy and numeracy	
4.7	By 2030, ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including through education for sustainable lifestyles, human rights, gender equality, promotion of peace and non-violence, global citizenship and appreciation of cultural diversity and of cultural contribution to sustainable development	
4.a	Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all	
4.b	Expand the number of scholarships available to developing countries for enrolment in higher education, including vocational training and information and communications technology, technical, engineering and scientific programmes, in developed countries and other developing countries	
4.c	By 2030, substantially increase the supply of qualified teachers, including through international cooperation for teacher training in developing countries	

*The wording of the targets in the above table has been simplified due to space constraints.



©UNOPS

PROJECT: SERBIAN SCHOOLS RECONSTRUCTION

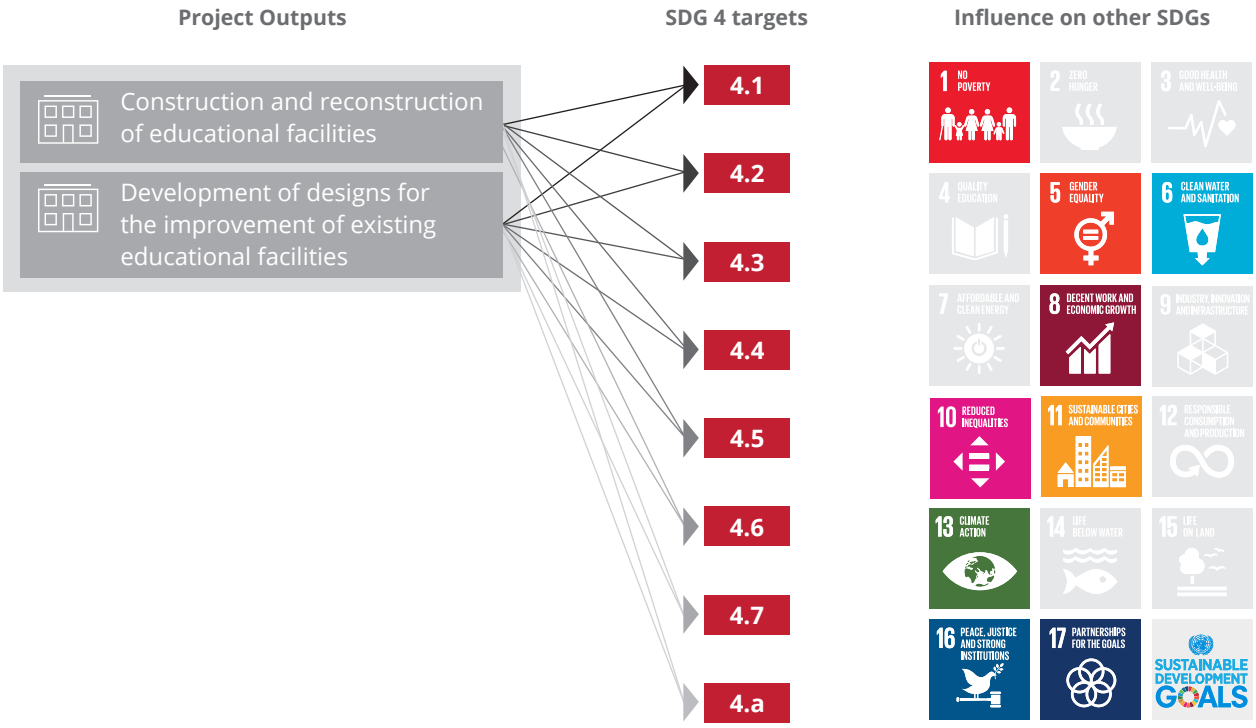
Location: Serbia | **Duration:** 2014 - 2017 | **Partners:** European Union, Govt. of Norway, Govt. of Switzerland, Govt. of Serbia

Project Description

After the flood that affected Serbia in May 2014, UNOPS contributed to the rehabilitation efforts with the construction and reconstruction of 23 schools and 2 kindergartens in flood affected areas of western and eastern Serbia. The reconstruction restored adequate conditions for education to 32,323 students and work for 1,800 teachers and staff. UNOPS also constructed the building for the Faculty of Economics in Subotica University.

As part of the EU PROGRES Program, UNOPS also reconstructed 11 education facilities and retrofitted another 15 in underdeveloped municipalities in the southeast and southwest of the country. Other components of the program managed by UNOPS included support to entrepreneurship, education and skills development for more than 9,000 people from vulnerable groups including women, people with disabilities and ethnic minorities such as the Roma.

Influence of project outputs on SDG 4 targets and other SDGs





SDG 5: ACHIEVE GENDER EQUALITY AND EMPOWER ALL WOMEN AND GIRLS

Empowering women and girls to reach their full potential requires that they have equal opportunities to those of men and boys. This means eliminating all forms of discrimination and violence against them, including violence by intimate partners, sexual violence and harmful practices, such as child marriage and female genital mutilation (FGM). Ensuring that women have better access to paid employment, sexual and reproductive health and reproductive rights, and real decision-making power in public and private spheres will further ensure that development is equitable and sustainable.

Infrastructure's role in achieving targets on gender equality is largely linked to creating opportunities for women's empowerment by facilitating and modernising the provision of infrastructure services that have been traditionally assigned to women. In many regions, particularly in rural areas, girls and women may spend hours each day collecting fuel, such as firewood, for cooking and household use, as well as drinking water.[16] As a result, many are limited in their educational or economic potential. The provision of accessible energy and water supply infrastructure in all communities can allow more time for the equitable pursuit of economic, social, and leadership activities, and reduce time spent in unpaid domestic work.[17] Information and communication infrastructure provides enabling technology by which women may attain economic empowerment or greater influence in their communities.

In addition to time savings, women's health, safety and well-being can be improved through the provision of infrastructure. Electrification may reduce exposure to cooking fumes in homes, while street lighting may decrease the potential for sexual harassment and violence towards women and girls in public spaces. Transportation allows the provision and administration of sexual and reproductive health supplies and services to all communities,[18] including inaccessible or remote areas. More broadly, eliminating discriminatory practices and gender-based violence requires infrastructure related to governance and rule of law at the national and local levels to implement legal protections, enforce laws and ensure access to justice.

SDG 5 targets with infrastructure influence		Linkages to infrastructure sector
5.1	End all forms of discrimination against all women and girls everywhere	
5.2	Eliminate all forms of violence against all women and girls in the public and private spheres, including trafficking and sexual and other types of exploitation	
5.3	Eliminate all harmful practices, such as child, early and forced marriage and female genital mutilation	
5.4	Recognize and value unpaid care and domestic work through the provision of public services, infrastructure and social protection policies and the promotion of shared responsibility within the household and the family as nationally appropriate	
5.5	Ensure women's full and effective participation and equal opportunities for leadership at all levels of decision-making in political, economic and public life	
5.6	Ensure universal access to sexual and reproductive health and reproductive rights as agreed in accordance with the Programme of Action of the International Conference on Population and Development and the Beijing Platform for Action and the outcome documents of their review conferences	
5.a	Undertake reforms to give women equal rights to economic resources, as well as access to ownership and control over land and other forms of property, financial services, inheritance and natural resources, in accordance with national laws	
5.b	Enhance the use of enabling technology, in particular information and communications technology, to promote the empowerment of women	
5.c	Adopt and strengthen sound policies and enforceable legislation for the promotion of gender equality and the empowerment of all women and girls at all levels	



©UNOPS

PROJECT: HOUSING RECONSTRUCTION IN HUMANITARIAN CRISIS

Location: Gaza, Palestine (State of) | **Duration:** 2016 - 2018 | **Partners:** KfW, Norwegian Refugee Council

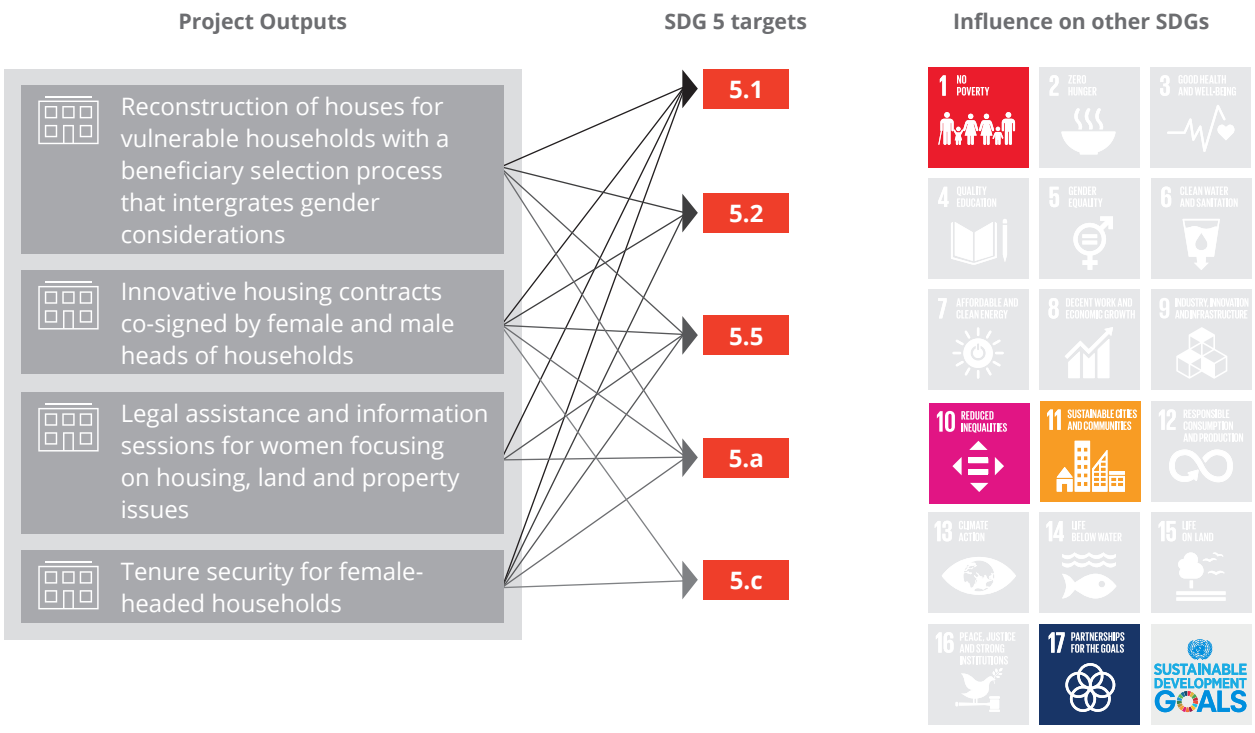
Project Description

UNOPS has managed the reconstruction of totally destroyed houses for the most vulnerable internally displaced persons (IDP) households resulting from the 2014 conflict in Gaza, and thereby provided relief to the ongoing humanitarian crisis. The project provisioned cash grants, legal aid, technical infrastructure, construction guidance, and quality assurance to enable the most vulnerable or underserved families to reconstruct the houses safely, sustainably and efficiently.

The project specifically addressed women's access to housing, land, and property rights through two activities:

1) creating a grant contract that could be co-signed by both male and female heads of household, and
2) providing legal support to female-headed households helping them to receive tenure. Of the 188 beneficiaries that participated in the process for cash grants, 13.1% were female-headed households. The project led to 519 beneficiaries receiving legal assistance on housing, land, and property (HLP) issues, which resulted in 306 beneficiaries obtaining legal tenure of their new homes. The project provided tenure to 21 female-headed households in the Gaza context where security of tenure is rare, and security of tenure for women is even rarer.

Influence of project outputs on SDG 5 targets and other SDGs





SDG 6: ENSURE AVAILABILITY AND SUSTAINABLE MANAGEMENT OF WATER AND SANITATION FOR ALL

Goal 6 goes beyond drinking water, sanitation and hygiene to also address the quality and sustainability of water resources, critical to the survival of people and the planet. The 2030 Agenda recognizes the centrality of water resources to sustainable development, and the vital role that improved drinking water, sanitation and hygiene play in progress in other areas, including health, education and poverty reduction.

Within the context of an integrated water resources management (IWRM) approach to water security, which promotes co-ordinated development and management of water and related resources to maximise social, economic and environmental outcomes,[19] investment in water supply, wastewater, and flood risk management infrastructure is required for the achievement of all Goal 6 outcome targets (6.1 - 6.6). This includes universal and equitable access to safe and affordable drinking water and sanitation services, managed abstraction and discharge and the elimination of solid and hazardous waste dumping to protect water-related ecosystems.[20] Better water use efficiency through reduced leakage and increased reuse can maintain freshwater withdrawals at sustainable levels.

Energy systems often form a component of water supply, such as through the operation of pumps. They can also be water-intensive and should therefore be designed to minimize water usage and pollution. In certain regions, the delivery of water by means of trucks may be the more feasible option; thus, a reliable road network to access these communities can provide an alternative to the construction of piped water networks, which may be financially burdensome.

Given the transboundary nature of many rivers, lakes, aquifers and waterways, international cooperation and capacity building are important components of effective water management. This requires governance and institutional infrastructure, including community-level venues, where stakeholders can access information and receive training and support from local or international experts and practitioners. Transportation networks and the use of digital communications infrastructure provide the access and capabilities to further these objectives.[21]

SDG 6 targets with infrastructure influence		Linkages to infrastructure sector
6.1	By 2030, achieve universal and equitable access to safe and affordable drinking water for all	
6.2	By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations	
6.3	By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	
6.4	By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity	
6.5	By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate	
6.6	By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes	
6.a	By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies	
6.b	Support and strengthen the participation of local communities in improving water and sanitation management	



©UNOPS

PROJECT: URBAN WATER SUPPLY

Location: Sudan | **Duration:** 2010 - 2015 | **Partners:** Urban Water Administrations, UK Aid (DFID)

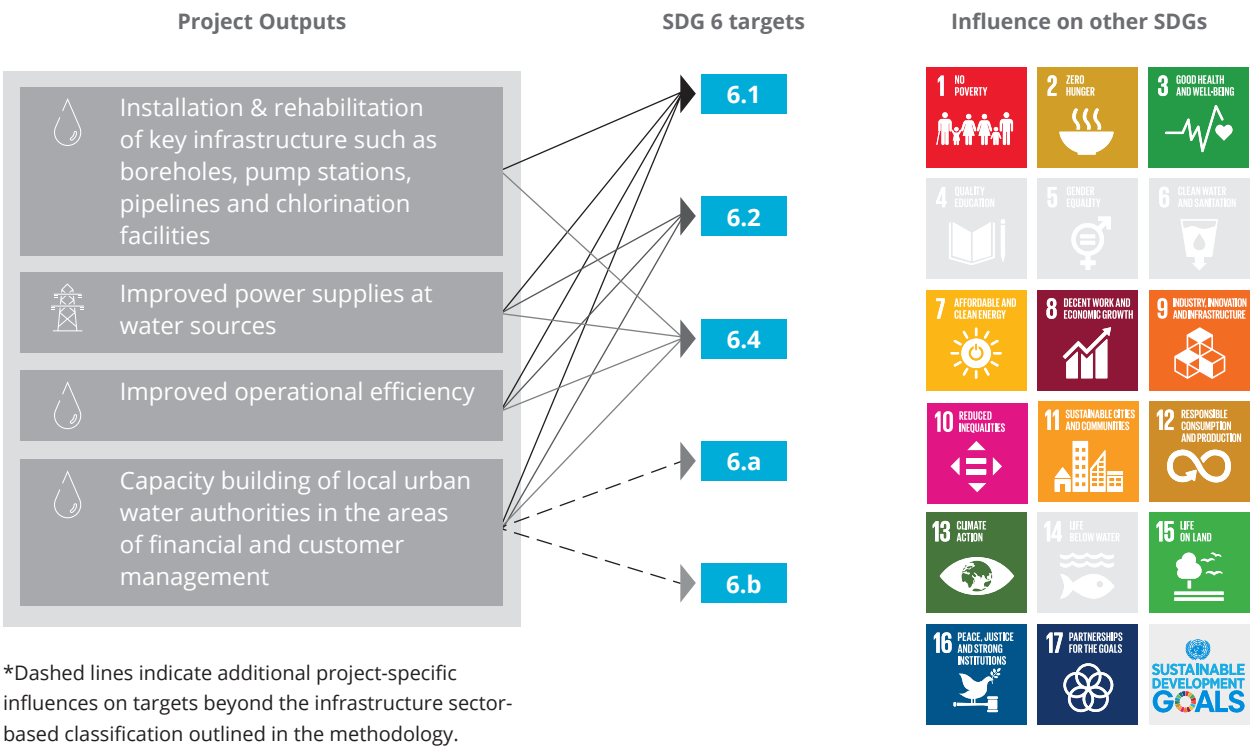
Project Description

UNOPS implemented the Darfur Urban Water Supply Project to rehabilitate water source and transmission infrastructure with the aim of improving access to clean drinking water in four state capitals of Darfur: El Fasher, Nyala, El Geneina and Zalingei. In total, 4 major pump stations and storage facilities were constructed, 56 kilometres of distribution pipelines and 2 chlorination facilities were installed, and 42 deep boreholes were rehabilitated.

To ensure the reliable functioning of the pumps UNOPS improved the power supply around water sources.

Capacity development activities and staff trainings were also completed for the urban water authorities together with the implementation of new financial management systems with the aim of improving customer service and operational efficiency. Thanks to the cost savings from proper budgeting and project management practices, new service connections were provided to the poorest at risk families. The project has benefited 250,000 people that now have access to clean water, and also contributed significantly to the reduction of household expenditures on water from private sources.

Influence of project outputs on SDG 6 targets and other SDGs



*Dashed lines indicate additional project-specific influences on targets beyond the infrastructure sector-based classification outlined in the methodology.



SDG 7: ENSURE ACCESS TO AFFORDABLE, RELIABLE, SUSTAINABLE AND MODERN ENERGY FOR ALL

Access to affordable, reliable and sustainable energy is crucial to achieving many of the Sustainable Development Goals. Energy access, however, varies widely across countries and the current rate of progress falls short of what will be required to achieve the Goal. Redoubled efforts will be needed, particularly for countries with large energy access deficits and high energy consumption.

Given its vital role as a resource input to development, infrastructure will need to address core dimensions of energy sustainability, defined by the World Energy Council as the "Trilemma" of energy security, universal access to affordable energy services, and environmentally sensitive production and use of energy.[22] The outcome targets of Goal 7 (7.1 -7.3) capture each of these broader objectives and highlight the important interdependence between the energy and transport sectors, where improved fuel efficiency in vehicles and technological trends such as the electrification of transport may simultaneously reduce energy demand and fossil fuel emissions on a large scale if made more widely accessible to the public.

As with other forms of infrastructure growth, technological innovation in the energy sector with large-scale global impacts will require global cooperation, knowledge transfer and capacity building through research and investment flows, which may be enhanced through the involvement of higher education and research facilities. Digital technology and communications will also be a key input to growth in this sector.

SDG 7 targets with infrastructure influence		Linkages to infrastructure sector
7.1	By 2030, ensure universal access to affordable, reliable and modern energy services	
7.2	By 2030, increase substantially the share of renewable energy in the global energy mix	
7.3	By 2030, double the global rate of improvement in energy efficiency	
7.a	By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology	
7.b	By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support	



©UNOPS

PROJECT: RURAL RENEWABLE ENERGY

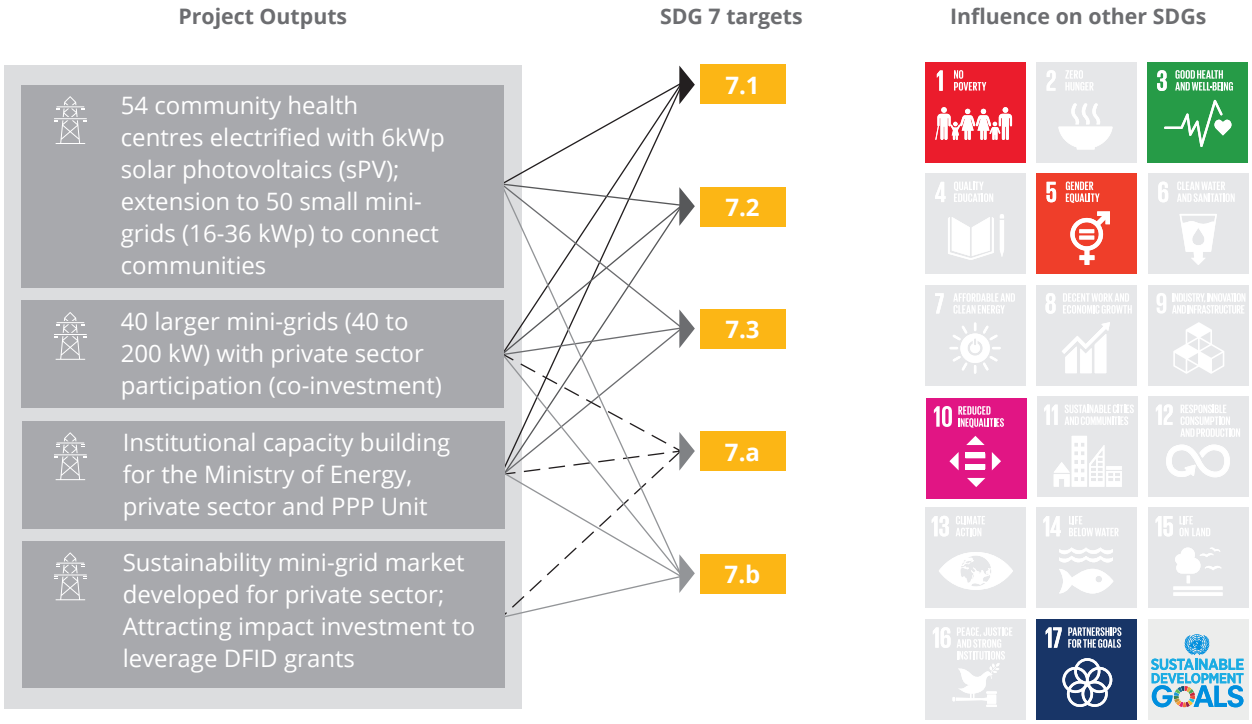
Location: Sierra Leone | **Duration:** 2016 - 2020 | **Partners:** Ministry of Energy, UK Aid (DFID)

Project Description

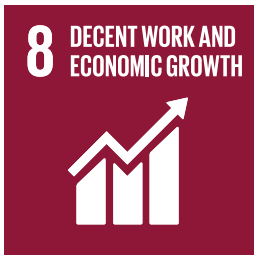
UNOPS is implementing a rural renewable energy project in Sierra Leone with the aim of improving energy access for rural communities through private sector involvement. The project will provide technical and financial solutions for delivering low carbon electricity to supply entire villages by building solar-powered mini-grids, centred on community health centres and operated as commercial enterprises through the engagement of private sector operators and investors. The project uses an integrated approach to enhance energy security, support business start-ups, reduce local pollution, and improve the livelihoods and living conditions of local communities – with special attention to vulnerable groups, including women and young people.

The project will benefit up to 360,000 people living in remote and rural areas, providing them with access to low-carbon electricity. The project addresses the critical need for electricity in health facilities and helps refrigerate vaccines, operate medical equipment and provide light for late night medical services.

Influence of project outputs on SDG 7 targets and other SDGs



*Dashed lines indicate additional project-specific influences on targets beyond the infrastructure sector-based classification outlined in the methodology.



SDG 8: PROMOTE SUSTAINED, INCLUSIVE AND SUSTAINABLE ECONOMIC GROWTH, FULL AND PRODUCTIVE EMPLOYMENT AND DECENT WORK FOR ALL

Sustained and inclusive economic growth is a prerequisite for sustainable development, which can contribute to improved livelihoods for people around the world. Economic growth can lead to new and better employment opportunities and provide greater economic security for all. Moreover, rapid growth, especially among the least developed and other developing countries, can help them reduce the wage gap relative to developed countries, thereby diminishing glaring inequalities between the rich and poor.

Infrastructure systems play an important role in increasing national economic growth and productivity, which require secure and accessible energy sources, transport networks to link producers and consumers, digital technology and communications to increase value added and provide efficiencies at all stages of the value chain.[23,24] Water is a key input to manufacturing, while waste management systems treat or recover energy from billions of tonnes of residual materials created from the production process. Access to reliable infrastructure that performs these functions, as well as the provision of built economic infrastructure such as factories, industrial and storage facilities and markets, is key to attracting new investment and expanding existing economic activity while generating employment and improving livelihoods. Moreover, adapting infrastructure to function at decreased levels of resource use and incorporating user behaviour in product design can ensure that this growth is sustained without depleting the world's natural resources or inflicting irreversible damage on the environment.[25]

Making economic growth more inclusive means reaching and providing economic opportunity to all, including the most vulnerable. Improved transportation networks can link workers with suitable jobs, facilitating rural to urban and interurban commuting for skilled and unskilled workers, including women and youth.[26] The transition to a digital economy creates new opportunities for growth through a range of ICT-based jobs while allowing for teleworking and financial inclusion through access to digital banking and services.[27]

SDG 8 targets with infrastructure influence		Linkages to infrastructure sector
8.1	Sustain per capita economic growth and, in particular, at least 7 per cent gross domestic product growth per annum in the least developed countries	
8.2	Achieve higher levels of economic productivity through diversification, technological upgrading and innovation	
8.3	Promote development-oriented policies that support productive activities, decent job creation, entrepreneurship, creativity and innovation, and encourage the formalization and growth of micro-, small- and medium-sized enterprises	
8.4	Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, with developed countries taking the lead	
8.5	Achieve full and productive employment and decent work for all, including for young people and persons with disabilities, and equal pay for work of equal value	
8.6	By 2020, substantially reduce the proportion of youth not in employment, education or training	
8.7	Eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms	
8.8	Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment	
8.9	By 2030, devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products	
8.10	Strengthen the capacity of domestic financial institutions to encourage and expand access to banking, insurance and financial services for all	
8.b	By 2020, develop and operationalize a global strategy for youth employment	

*The wording of the targets in the above table has been simplified due to space constraints.



©UNOPS

PROJECT: RURAL ACCESS IMPROVEMENT

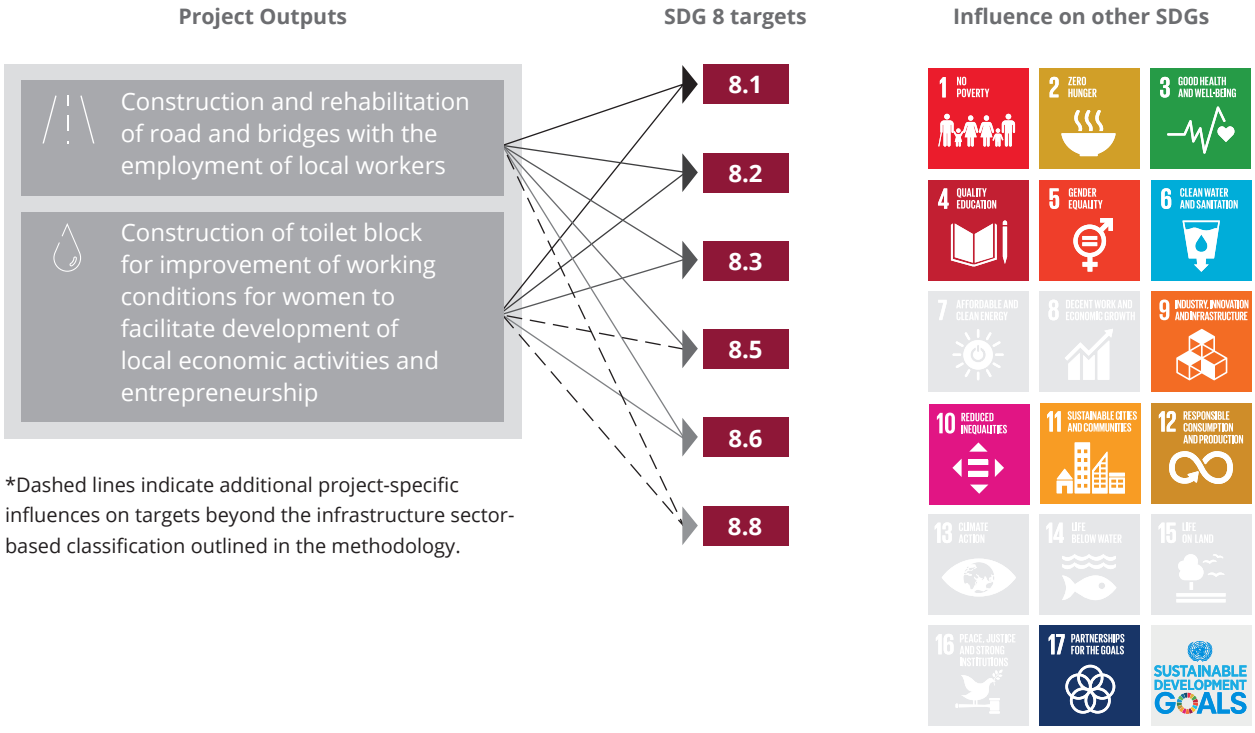
Location: Afghanistan | **Duration:** 2007 - 2015 | **Partners:** Sida

Project Description

Since 2007, UNOPS has constructed and rehabilitated 20 bridges and 683 kilometres of roads in northern Afghanistan under the SIDA-funded Rural Access Improvement Project. The aim of the project is to reduce regional disparities, support equitable growth, and increase living standards.

Apart from easing access to local markets and other life-improving services, the project also supports the creation of economic activities for local women which range from tailoring to wool spinning, and from keeping livestock to making dairy products. In addition, 105 women received training on building techniques for retaining wall construction. To enhance the local bazaar of Dawlatabad, which draws crowds of 10,000 people twice a week, UNOPS also supported the community in the construction of a toilet block fitted with a water tank and a solar pump for the women coming to the market from the 56 nearby villages.

Influence of project outputs on SDG 8 targets and other SDGs



*Dashed lines indicate additional project-specific influences on targets beyond the infrastructure sector-based classification outlined in the methodology.



SDG 9: BUILD RESILIENT INFRASTRUCTURE, PROMOTE INCLUSIVE AND SUSTAINABLE INDUSTRIALIZATION AND FOSTER INNOVATION

Goal 9 addresses three important aspects of sustainable development: infrastructure, industrialization and innovation. Infrastructure provides the basic physical facilities essential to business and society; industrialization drives economic growth and job creation, thereby reducing income inequality; and innovation expands the technological capabilities of industrial sectors and leads to the development of new skills.

By definition, achieving Goal 9 targets requires growth across all sectors to strengthen the resilience, inclusiveness and sustainability of infrastructure systems. The benefits of strong national infrastructure extend to the achievement of outcomes across all 17 Sustainable Development Goals. For example, the design of infrastructure systems can specifically incorporate objectives around industrialisation and industry (Goal 8), sustainability and resource-use efficiency (Goals 7 and 12), and equitable access (Goals 5 and 10). Future infrastructure development will need to address questions around the balance of capacity provision and demand management, vulnerabilities in infrastructure networks, and governance models used to finance and deliver infrastructure services.[28]

The technological innovation required to progress toward Goal 9 will involve extensive R&D and scientific research, in addition to financial and technical support to developing countries. Access to information and communication technology will play a large role in fostering the international cooperation required and skills development required to achieve this level of innovation.[29]

SDG 9 targets with infrastructure influence		Linkages to infrastructure sector
9.1	Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all	
9.2	Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries	
9.3	Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets	
9.4	By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities	
9.5	Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending	
9.a	Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States	
9.b	Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities	
9.c	Significantly increase access to information and communications technology and strive to provide universal and affordable access to the Internet in least developed countries by 2020	



©UNOPS

PROJECT: LOCAL MARKET RECONSTRUCTION

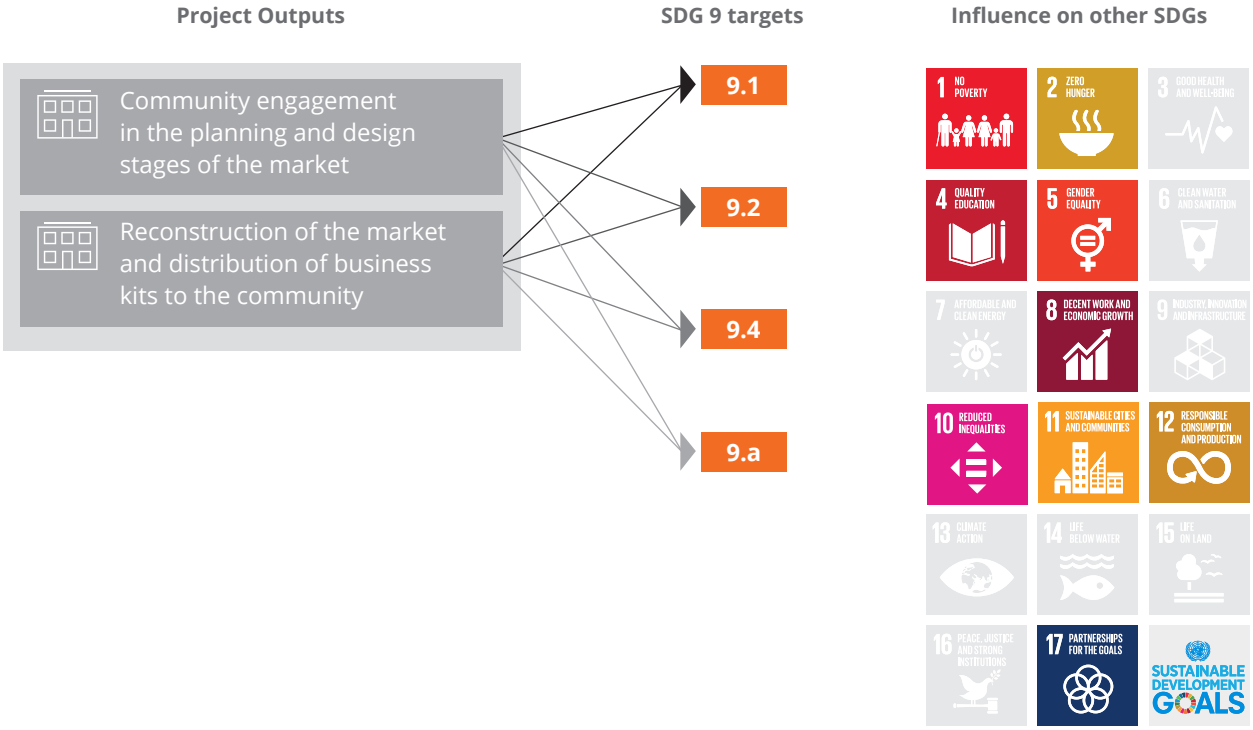
Location: Somalia | **Duration:** 2015 - 2018 | **Partners:** Government of Japan

Project Description

UNOPS reconstructed the market of Bossaso in Northern Somalia after it was damaged by a fire in 2012. The market represents the central economic area for the community, in particular women and informal traders (including minorities such as Yemeni refugees) as they now have to provide an income for their families after many years of conflict in their country.

UNOPS engaged with nearly 2,000 male and female entrepreneurs in the design and planning of the market to ensure it met the needs of the end user and to increase the sense of ownership over the final product. In addition, 200 traders, of which 90% were women, received business skills training and business start-up kits to help their businesses develop. The renovated market and new skills will help local traders generate higher incomes to support their families. This in turn will increase economic development in the region and encourage wider stability.

Influence of project outputs on SDG 9 targets and other SDGs





SDG 10: REDUCE INEQUALITY WITHIN AND AMONG COUNTRIES

Goal 10 calls for reducing inequalities in income as well as those based on sex, age, disability, race, class, ethnicity, religion and opportunity – both within and among countries – and addresses issues related to representation and development assistance.

The provision of infrastructure has been shown to reduce inequality within countries. Among the poorest, increased access to infrastructure can improve health and well-being by providing reliable basic services and allowing people to pursue livelihoods and economic opportunities. Built infrastructure, including shelter and community governance facilities as well as energy, water and waste treatment networks, should be designed to target particularly vulnerable segments of society.

An example of infrastructure's potential role in empowering disadvantaged groups is highlighted in Goal 5: due to traditional gender roles, domestic responsibilities including the collection of fuel and water may limit the economic and educational potential of women and girls in some regions.

This disadvantage can be removed through the provision of modern energy or water supply infrastructure, or, alternatively, efficient transportation allowing for the delivery of these services directly to communities and households.

Infrastructure can also reduce inequalities between countries by encouraging financial flows, through foreign investment, to regions where needs are greatest. A country's attractiveness to investment is increased with quality and resilient infrastructure systems by lowering costs of doing business and smoothing the functioning of investors' production and trade activities.[30,31] Digital payment methods provide more efficient channels for transferring migrant remittances to family members in countries of origin.[32]

SDG 10 targets with infrastructure influence		Linkages to infrastructure sector
10.1	By 2030, progressively achieve and sustain income growth of the bottom 40 per cent of the population at a rate higher than the national average	
10.2	By 2030, empower and promote the social, economic and political inclusion of all, irrespective of age, sex, disability, race, ethnicity, origin, religion or economic or other status	
10.3	Ensure equal opportunity and reduce inequalities of outcome, including by eliminating discriminatory laws, policies and practices and promoting appropriate legislation, policies and action in this regard	
10.4	Adopt policies, especially fiscal, wage and social protection policies, and progressively achieve greater equality	
10.5	Improve the regulation and monitoring of global financial markets and institutions and strengthen the implementation of such regulations	
10.6	Ensure enhanced representation and voice for developing countries in decision-making in global international economic and financial institutions in order to deliver more effective, credible, accountable and legitimate institutions	
10.7	Facilitate orderly, safe, regular and responsible migration and mobility of people, including through the implementation of planned and well-managed migration policies	
10.b	Encourage official development assistance and financial flows, including foreign direct investment, to States where the need is greatest, in particular least developed countries, African countries, small island developing States and landlocked developing countries, in accordance with their national plans and programmes	
10.c	By 2030, reduce to less than 3 per cent the transaction costs of migrant remittances and eliminate remittance corridors with costs higher than 5 per cent	



©UNOPS/Claude-André Nadon

PROJECT: 16/6 NEIGHBOURHOOD RECONSTRUCTION

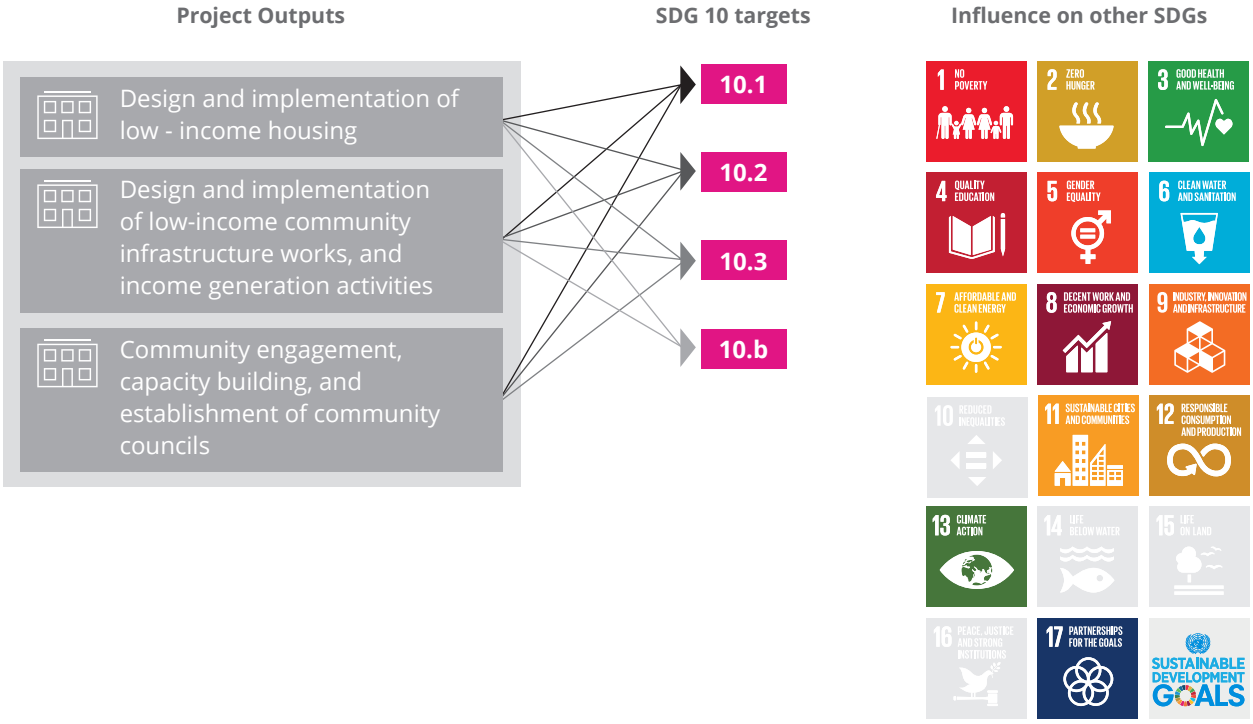
Location: Haiti | **Duration:** 2011 - 2017 | **Partners:** UNDP, ILO, IOM, Government of Haiti

Project Description

After the 2010 earthquake that killed over 220,000 people and displaced more than 1 million, UNOPS was assigned with the design and implementation of low-income housing and community infrastructure works in eight neighbourhoods of Port-Au-Prince: Morne Hercule, Morne Lazarre, Nerette, Bois Patate, Morne Ebo, Jean Baptiste, Villa Rosa and Fort National.

UNOPS was responsible for repairing and rebuilding homes so that they satisfy risk-mitigation standards, as well as improving community infrastructure including sanitation and waste management facilities, public spaces, footpaths and access to drinking water, and other utilities. In total, 615 new housing units were built and 2,000 were rehabilitated. The project also created more than 15,000 working days with 95% of the workforce being from the local community. In order to make the project more sustainable, UNOPS also consistently engaged with local residents in order to train them on how to do maintenance works, and to establish community-led councils to take responsibility for water, electricity, waste management, and sanitation services and their associated fees.

Influence of project outputs on SDG 10 targets and other SDGs





SDG 11: MAKE CITIES AND HUMAN SETTLEMENTS INCLUSIVE, SAFE, RESILIENT AND SUSTAINABLE

Today, more than half the world's population lives in cities. By 2030, it is projected that 6 in 10 people will be urban dwellers. Despite numerous planning challenges, cities offer more efficient economies of scale on many levels, including the provision of goods, services and transportation. With sound, risk-informed planning and management, cities can become incubators for innovation and growth and drivers of sustainable development.

With urban areas estimated to grow by two-and-a-half times by 2050,[33] extensive cross-sectoral infrastructure planning for cities will need to be implemented[34] to ensure basic services[35] for urban dwellers, including health, educational, housing and other facilities that require energy, water, transportation and digital communication networks as well as effective waste management infrastructure.

New urban infrastructure must be built to be safe and affordable for its residents. Transport systems can be designed, using increased digital technology, to reduce road accidents, while public transportation and sanitation facilities can be expanded to provide safer and accessible options to all people.[36] Air quality, linked to emissions from the energy and transport sectors, as well as municipal waste and wastewater management require specific attention in cities to reduce or eliminate adverse health effects.[37]

In the context of climate change, and given the economic and social costs at stake, resiliency must be built into new and existing critical infrastructure in cities across all sectors as outlined in the Sendai Framework for Disaster Risk Reduction.[38] Adequate flood risk infrastructure will ensure additional protection for cities' cultural heritage.[39]

SDG 11 targets with infrastructure influence		Linkages to infrastructure sector
11.1	By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums	
11.2	By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons	
11.3	Enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning	
11.4	Strengthen efforts to protect and safeguard the world's cultural and natural heritage	
11.5	By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations	
11.6	By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management	
11.7	By 2030, provide universal access to safe, inclusive and accessible, green and public spaces , in particular for women and children, older persons and persons with disabilities	
11.a	Support positive economic, social and environmental links between urban, peri-urban and rural areas by strengthening national and regional development planning	
11.b	By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels	
11.c	Support least developed countries, including through financial and technical assistance, in building sustainable and resilient buildings utilizing local materials	

*The wording of the targets in the above table has been simplified due to space constraints.



©UNOPS

PROJECT: REHABILITATION OF RIVERTON ROAD

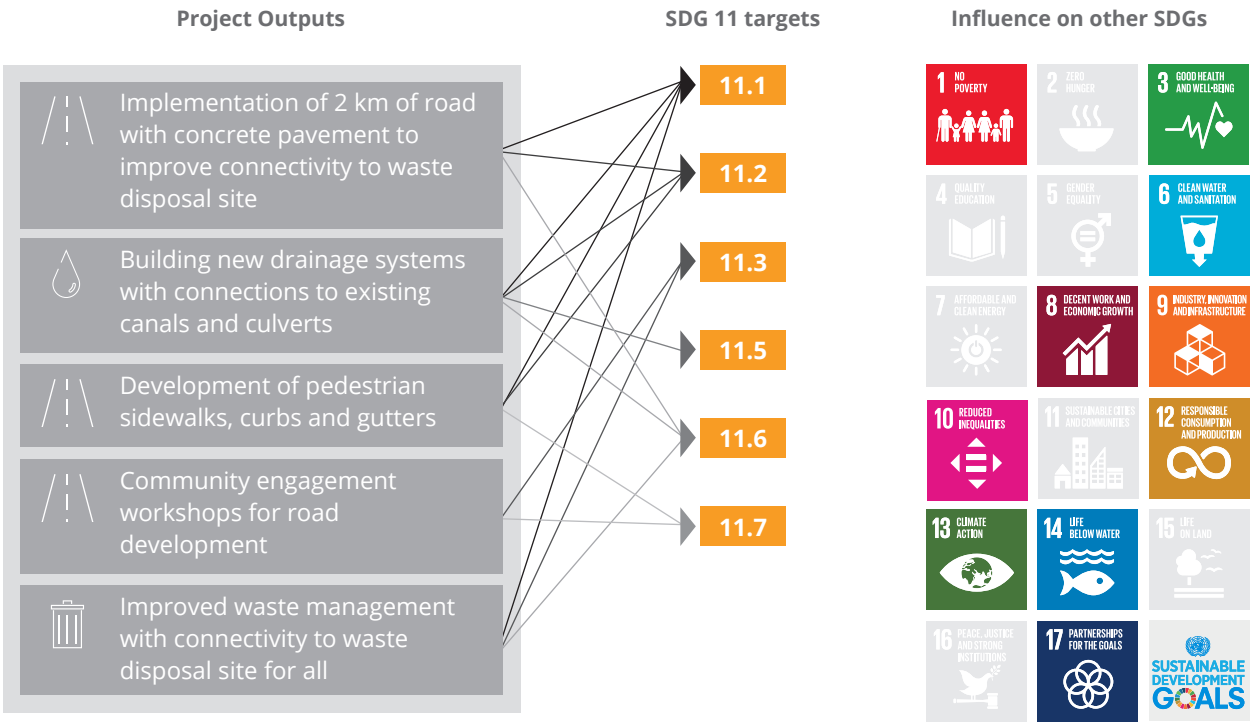
Location: Jamaica | **Duration:** 2015 - 2016 | **Partners:** Government of Mexico, Government of Jamaica

Project Description

UNOPS designed and constructed Riverton Road, an approximately 2 km road between Riverton City and the Riverton City landfill site. The aim of the project was to improve the efficiency of garbage collection from the neighbouring urban areas by improving connectivity to the disposal site. The improved road conditions enabled the dump trucks to make more trips to the landfill site. The road was developed with a concrete pavement along with sidewalks and a functioning drainage system.

The dust kicked up from the unpaved road caused respiratory problems and bad drainage brought the risk of flooding and water-borne illnesses. The implementation of the concrete road ensured the delivery of health and environmental benefits for the residents of the city.
A labour-based approach was adopted for the project which included engaging the community of Riverton. With the provision of jobs for nearly 300 people, the project promoted local economic development. Furthermore, with each trip, the trucks deliver scrap metal to local small business owners which use it for income generation.

Influence of project outputs on SDG 11 targets and other SDGs





SDG 12: ENSURE SUSTAINABLE CONSUMPTION AND PRODUCTION PATTERNS

Sustainable growth and development require minimizing the natural resources and toxic materials used, and the waste and pollutants generated, throughout the entire production and consumption processes. Goal 12 encourages more sustainable consumption and production patterns through various measures, including specific policies and international agreements on the management of materials that are toxic to the environment.

Consumption and production rely on a continued supply of resource inputs, including energy and water, as well as the treatment of waste outputs to the air, water and soil. Redesigning these processes to reduce resource use and minimise environmental impacts will involve fundamental changes to the way in which we plan, construct and use infrastructure systems.[40]

Food waste occurs at all stages of the supply chain and accounts for one-third of total food produced for human consumption, or approximately 1.3 billion tonnes per year.[41] The provision of adequate refrigeration throughout the production process, improvements to the efficiency of food transportation and the use of digital technology to improve production and consumption choices can assist in limiting these losses.[42]

The use of digital communications can influence behaviour to reduce the environmental impacts of consumption. With computers and mobile phones in widespread use, the internet can provide useful resources to promote behavioural changes such as reduced energy consumption, recycling and general sustainability awareness.[43] These can also be incorporated in school curricula or sustainable tourism campaigns. The increasing substitution of in-person meetings with online, phone or video communication may contribute to decreased traffic congestion and transport emissions.

SDG 12 targets with infrastructure influence		Linkages to infrastructure sector
12.1	Implement the 10-year framework of programmes on sustainable consumption and production, all countries taking action, taking into account the development and capabilities of developing countries	
12.2	By 2030, achieve the sustainable management and efficient use of natural resources	
12.3	By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses	
12.4	Achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, and reduce their release to air, water and soil in order to minimize their adverse impacts	
12.5	By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse	
12.6	Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle	
12.7	Promote public procurement practices that are sustainable, in accordance with national policies	
12.8	By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature	
12.a	Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production	
12.b	Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products	
12.c	Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development	

*The wording of the targets in the above table has been simplified due to space constraints.



©UNOPS

PROJECT: CLIMATE COMMUNICATION CENTRE

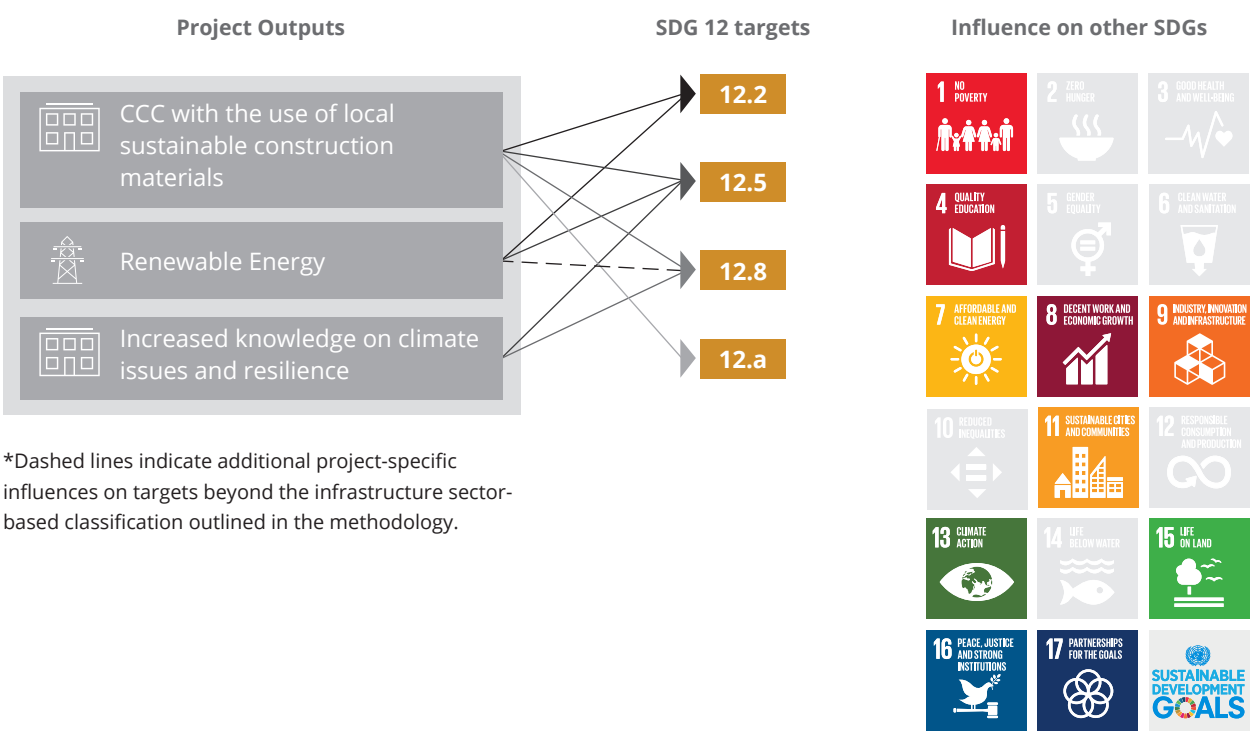
Location: Indonesia | **Duration:** 2012 - 2013 | **Partners:** Government of Norway, UNESCO, UNORCID

Project Description

UNOPS built the Climate Communication Centre (CCC) in Buntoi village using local natural materials and the local workforce. The use of bamboo for construction was prominent with large bamboo stalks making up the frame of the building, the columns, and roof support. The centre is also fully powered by solar energy.

The aim of the centre is to help reduce heavy deforestation and greenhouse gas emissions in the Kalimantan Province on the island of Borneo which are caused by heavy logging and unsustainable agricultural practices. The centre has created a space where local people benefit from global knowledge-sharing on climate issues to increase their resilience to climate change. The CCC also contributes to the tackling of illegal logging and the preservation of Indonesian wetlands.

Influence of project outputs on SDG 12 targets and other SDGs



*Dashed lines indicate additional project-specific influences on targets beyond the infrastructure sector-based classification outlined in the methodology.



SDG 13: TAKE URGENT ACTION TO COMBAT CLIMATE CHANGE AND ITS IMPACTS

Climate change presents the single biggest threat to development, and its widespread, unprecedented effects disproportionately burden the poorest and the most vulnerable. Goal 13 calls for urgent action not only to combat climate change and its impacts, but also to build resilience in responding to climate-related hazards and natural disasters.

Efforts to implement climate change adaptation and disaster risk reduction, as formalised in the 2015 Sendai Framework, highlight the need to invest in and enhance disaster preparedness and resilience to climate-related hazards.[44] To this end, infrastructure planning across all sectors should be integrated in national policies to ensure that the most vulnerable communities do not suffer disproportionate impacts from climate change.

In coastal regions and small island states, increasing sea level rise and greater occurrence of storm surges necessitate extensive flood risk management infrastructure to reduce exposure to water-related hazards. The design of energy, water supply and waste management systems should be such that affected communities can continue to receive basic services in the event of a disaster, including fuel and adequate sanitation, which will reduce the incidence of epidemics and other social risks. Should a community suffer extensive damage to key infrastructure assets, including homes, transportation links will be crucial for providing emergency aid during the recovery process.

In addition to providing early warning capabilities, digital information systems contribute to countries' capacities to better understand disaster risk and to strengthen responses through data collection, research and public awareness-raising.

SDG 13 targets with infrastructure influence		Linkages to infrastructure sector
13.1	Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	
13.2	Integrate climate change measures into national policies, strategies and planning	
13.3	Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	
13.b	Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities	



©UNOPS

PROJECT: RESILIENT INFRASTRUCTURE FOR CLIMATE CHANGE

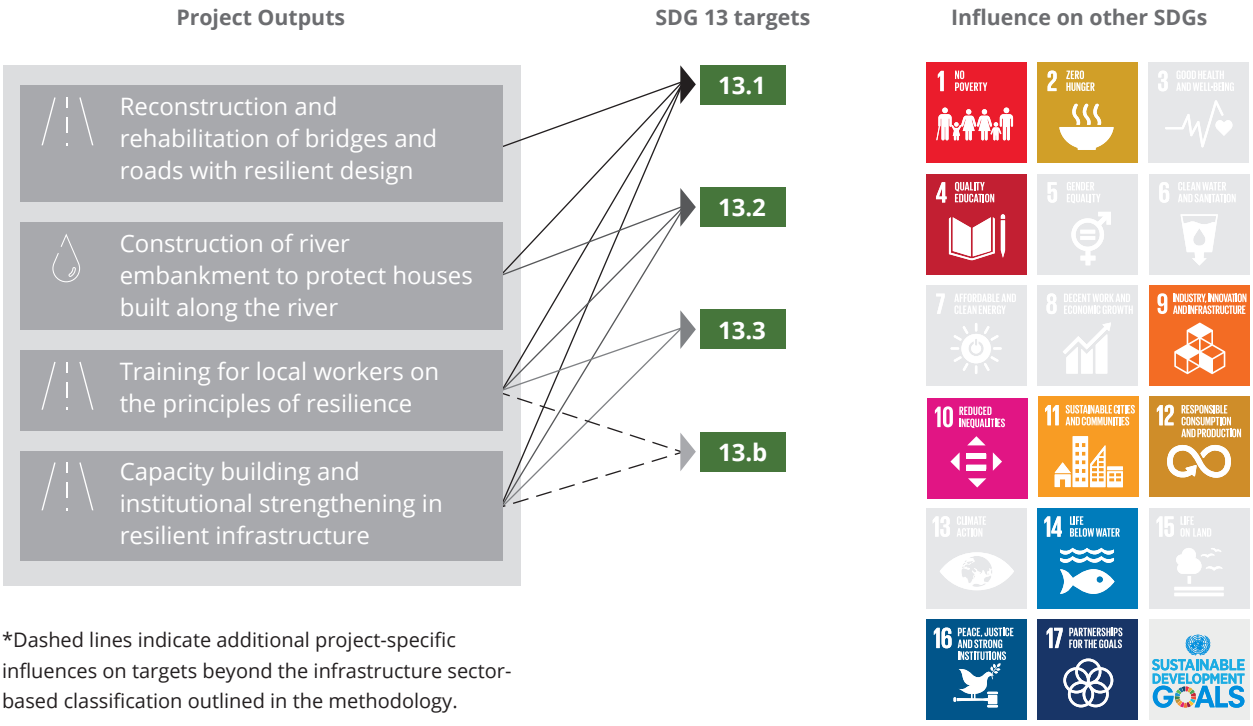
Location: Saint Vincent and the Grenadines | **Duration:** 2016 - 2020 | **Partners:** Government of St. Vincent, Government of Mexico

Project Description

UNOPS implemented the reconstruction project following the storm and flood in 2013 that caused severe damage to infrastructure on the small island developing state of Saint Vincent and the Grenadines. The project focused on building infrastructure that can help mitigate the impacts of climate change. This involved the reconstruction of 1 main bridge and 3 subsidiary bridges to connect the northern communities to the capital in the south, and enable access to various services. UNOPS also repaired 1.5 km of road and constructed a river defence system that aims to protect the houses that were built along the river bank in Spring Village.

All infrastructure was rebuilt and rehabilitated with a particular focus on community involvement and resilient design practices – for instance, the main bridge has been designed to withstand a category 5 hurricane. The main bridge can also be used as an emergency evacuation route in case of extreme weather events. UNOPS employed local workers and trained them on the principles of resilient construction and also provided capacity building for the Ministry of Transport officials.

Influence of project outputs on SDG 13 targets and other SDGs



*Dashed lines indicate additional project-specific influences on targets beyond the infrastructure sector-based classification outlined in the methodology.



SDG 14: CONSERVE AND SUSTAINABLY USE THE OCEANS, SEAS AND MARINE RESOURCES FOR SUSTAINABLE DEVELOPMENT

Oceans, seas and other marine resources are essential to human well-being and social and economic development worldwide. They provide livelihoods, subsistence and benefits from fisheries, tourism and other sectors, while regulating the global ecosystem by absorbing heat and carbon dioxide from the atmosphere. However, oceans and coastal areas are extremely vulnerable to environmental degradation, overfishing, climate change and pollution.

Eliminating the pollution of oceans, seas and marine areas will require action across infrastructure sectors: connecting cities and communities to wastewater treatment plants to prevent untreated discharge in waterways; providing adequate solid waste and recycling facilities to eliminate the emission of plastics and other wastes; incorporating coastal erosion in flood risk management plans; and regulating marine transport and contamination from fuels which are a major source of marine pollution.[45]

On a biodiversity level, a global transition away from fossil fuel burning and toward low-carbon energy infrastructure is necessary to combat ocean acidification, which, by reducing the availability of carbonate minerals in seawater, disrupts large components of the marine food web.[46] Preventing further biodiversity loss due to overfishing may also increasingly incorporate digital technologies such as satellite tracking and remote monitoring to ensure traceability of fish harvests and enforcement of penalties in line with international treaties.[47] Such actions are required to preserve the livelihoods of small-scale fishers, who also benefit from energy, transport and digital infrastructure to market their products.

Conservation of the oceans and their resources requires effective and participatory governance through international cooperation. Digital communications and technology can assist in providing the knowledge transfer and information sharing necessary to link the implementation of actions and policies between international partners.

SDG 14 targets with infrastructure influence		Linkages to infrastructure sector
14.1	By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution	
14.2	By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans	
14.3	Minimize and address the impacts of ocean acidification, including through enhanced scientific cooperation at all levels	
14.4	By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks to levels that can produce maximum sustainable yield	
14.5	By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information	
14.6	By 2020, prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing	
14.7	By 2030, increase the economic benefits to Small Island developing States and least developed countries from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism	
14.a	Increase scientific knowledge, develop research capacity and transfer marine technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries	
14.b	Provide access for small-scale artisanal fishers to marine resources and markets	
14.c	Enhance the conservation and sustainable use of oceans and their resources by implementing international law as reflected in UNCLOS	

*The wording of the targets in the above table has been simplified due to space constraints.



©UNOPS

PROJECT: WASTE MANAGEMENT PROGRAMME

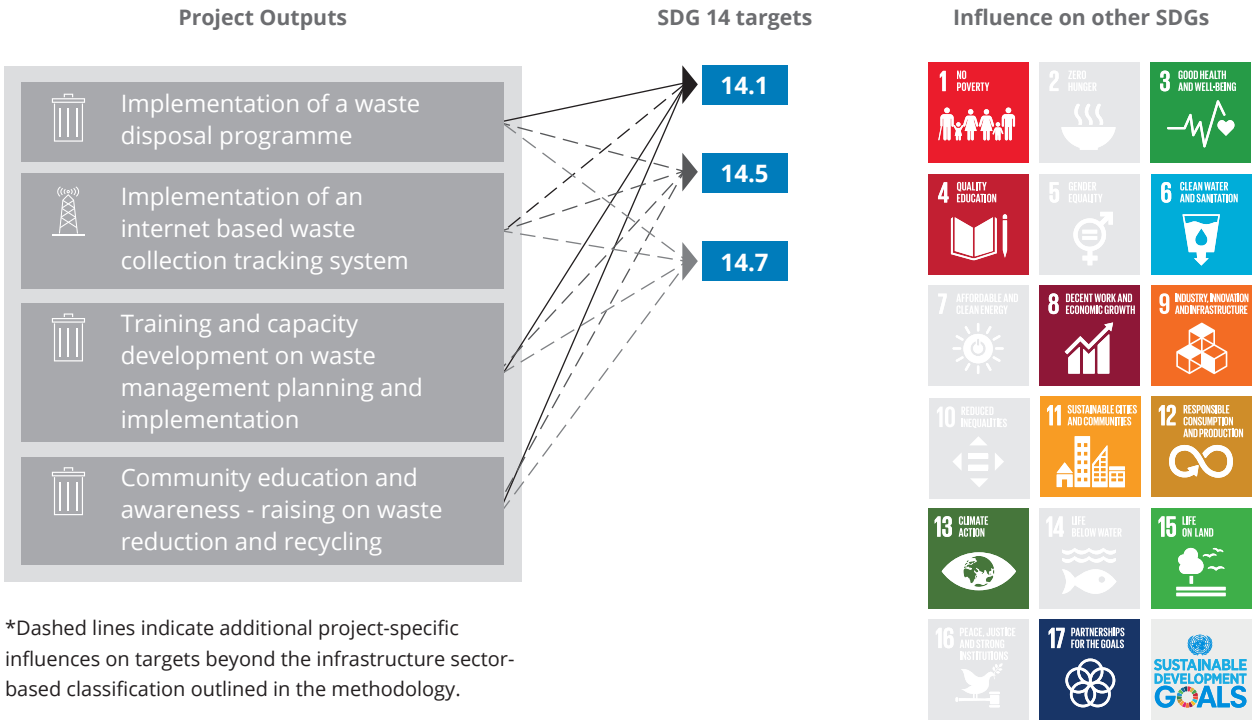
Location: Sri Lanka | **Duration:** 2011 - 2017 | **Partners:** Kattankudy Urban Council, European Union, Mobitel Sri Lanka

Project Description

UNOPS implemented a sustainable waste management programme in the coastal town of Kattankudy in the Eastern Province of Sri Lanka. Before the implementation of the programme Kattankudy's lagoon and surrounding area was used as a dumpsite by the urban council, due to the lack of a designated waste disposal area and a sustainable waste-management plan. UNOPS provided support in infrastructure, financial, and operational planning and management, including the establishment of monitoring systems, such as an internet-based waste collection tracking system.

UNOPS teamed up with a leading mobile service provider to implement a modern tracking system to monitor the waste collection fleet and improve efficiency in the waste collection process. 45,000 residents were also educated on the importance of waste segregation, waste reduction, compost production, income generation, risks associated with improper waste handling and importantly, the 3R concept of "Reducing, Reusing and Recycling". Finally, in order to improve the economic sustainability of the programme, income generation activities were also established.

Influence of project outputs on SDG 14 targets and other SDGs



*Dashed lines indicate additional project-specific influences on targets beyond the infrastructure sector-based classification outlined in the methodology.



SDG 15: PROTECT, RESTORE AND PROMOTE SUSTAINABLE USE OF TERRESTRIAL ECOSYSTEMS, SUSTAINABLY MANAGE FORESTS, COMBAT DESERTIFICATION, AND HALT AND REVERSE LAND DEGRADATION AND HALT BIODIVERSITY LOSS

Preserving diverse forms of life on land requires targeted efforts to protect, restore and promote the conservation and sustainable use of terrestrial and other ecosystems. Goal 15 focuses specifically on managing forests sustainably, halting and reversing land and natural habitat degradation, successfully combating desertification and stopping biodiversity loss.

Infrastructure can play a role in promoting sustainable land and forest management practices in order to combat desertification, soil degradation, and biodiversity loss in a range of biomes, including wetlands, mountains, forests and drylands. Appropriate flood risk protection can reduce the risk of land degradation, while the electrification of communities through renewable generation can provide a sustainable energy source that does not rely on the use of solid biomass fuels and can thus reduce deforestation. The planning of transport infrastructure such as roads can be designed to minimise impacts on terrestrial ecosystems, such as habitat destruction and fragmentation. The provision of infrastructure to provide suitable management of waste and wastewater can eliminate contamination or pollution. Using digital technology, remote monitoring using electronic tags can provide necessary data and information to combat poaching and the lucrative trade in illegal wildlife parts.[48]

SDG 15 targets with infrastructure influence		Linkages to infrastructure sector
15.1	By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements	
15.2	By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally	
15.3	By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world	
15.4	By 2030, ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development	
15.5	Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species	
15.7	Take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products	
15.8	By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species	
15.c	Enhance global support for efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities	



©UNOPS

PROJECT: WASTEWATER MANAGEMENT

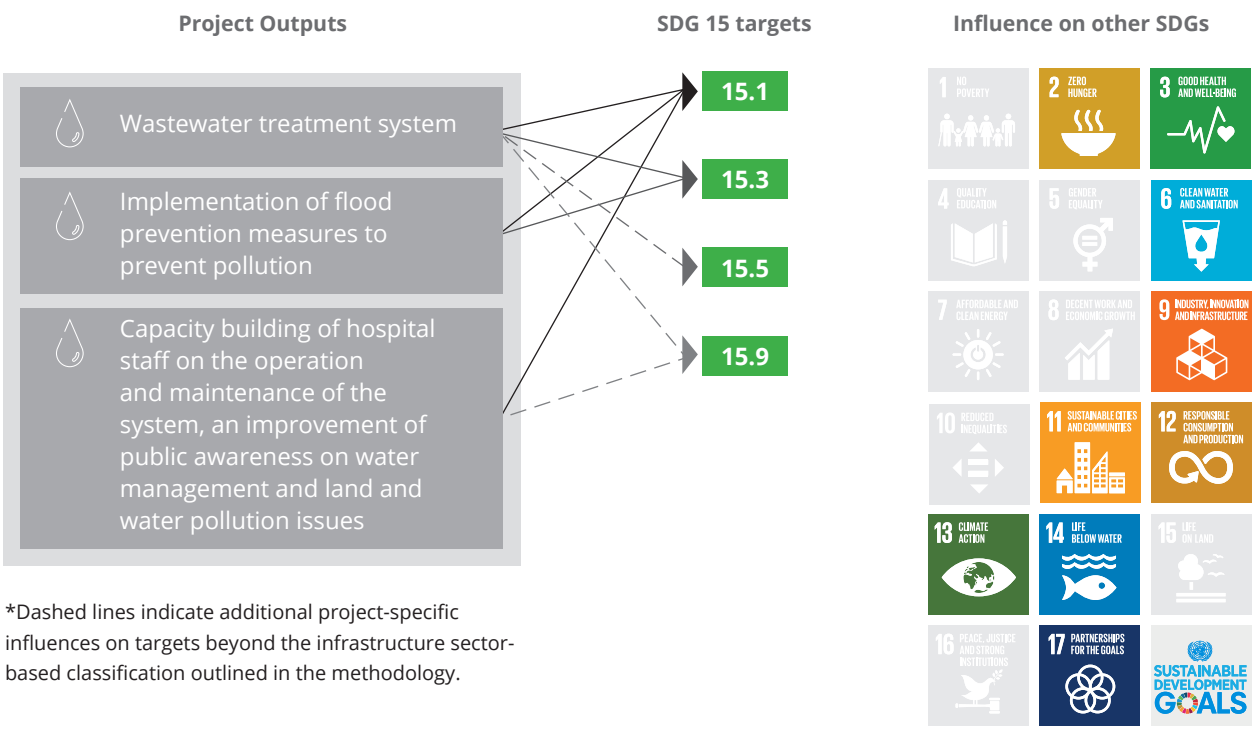
Location: Sri Lanka | **Duration:** 2014 - 2017 | **Partners:** European Union, Ministry of Health

Project Description

UNOPS delivered a wastewater collection and treatment system for the regional hospital of Vavuniya. The aims of the project were to prevent the discharging of wastewater in the areas surrounding the hospital and eliminate the contamination of surface and ground water used for drinking and irrigation. The project created a healthier environment for the 6,800 daily hospital users, and more than 400,000 people in the wider catchment area.

The project successfully decommissioned 150 clogged or broken septic tanks which polluted groundwater and required a pumping team to make six trips a day with a 6m^3 pump truck to a disposal site 12 km away. The new system also intercepted over 500 wastewater pipes which had been discharging to the surrounding surface waters which were used for agricultural irrigation. The final system was comprised of simplified sewerage, three large centralised septic tanks, solids free sewers and waste stabilisation ponds. This required only one moving part, no energy usage, and no expensive chemical treatments making it easy and affordable for the hospital to operate and maintain.

Influence of project outputs on SDG 15 targets and other SDGs



*Dashed lines indicate additional project-specific influences on targets beyond the infrastructure sector-based classification outlined in the methodology.



SDG 16: PROMOTE PEACEFUL AND INCLUSIVE SOCIETIES FOR SUSTAINABLE DEVELOPMENT, PROVIDE ACCESS TO JUSTICE FOR ALL AND BUILD EFFECTIVE, ACCOUNTABLE, AND INCLUSIVE INSTITUTIONS AT ALL LEVELS

The 2030 Agenda for Sustainable Development aims to promote peaceful and inclusive societies based on respect for human rights, the rule of law and transparent, effective and accountable institutions. The elimination of violence and armed conflict should be accompanied by strong institutional development at all levels of government, as well as universal access to justice, information and other fundamental freedoms.

Targeted infrastructure interventions can contribute to reductions in violence, conflict and crime across societies. For example, widespread electrification may enable steps to improve safety in communities such as the deterrent of violence through street lighting. Efficient roads and waterways can allow law enforcement timely access to communities in order to respond to emergencies and crimes.[49] While digital technology can enable more sophisticated crimes, including cybercrime and illicit financial flows, it also provides the necessary capabilities to combat them.[50] In some regions, infrastructure may have been damaged or destroyed by war or conflict; rebuilding it is a key step to restoring peace and order to the affected communities. The construction of police stations, courts and prisons to adequate standards will improve law enforcement and access to justice.

However, equally important to the achievement of peaceful and inclusive societies are strong and effective institutions. Participatory decision-making will require people, including the most vulnerable, to have access to institutions of governance at all levels. Such access may require better transport links – for example, to ensure all citizens can express their right to vote. Access and accountability can also be improved with the help of digital communications infrastructure, by allowing wider dissemination of information and online forums for public consultation. [51]

SDG 16 targets with infrastructure influence		Linkages to infrastructure sector
16.1	Significantly reduce all forms of violence and related death rates everywhere	
16.2	End abuse, exploitation, trafficking and all forms of violence against and torture of children	
16.3	Promote the rule of law at the national and international levels and ensure equal access to justice	
16.4	By 2030, significantly reduce illicit financial and arms flows, strengthen the recovery and return of stolen assets and combat all forms of organized crime	
16.5	Substantially reduce corruption and bribery in all their forms	
16.6	Develop effective, accountable and transparent institutions at all levels	
16.7	Ensure responsive, inclusive, participatory and representative decision-making at all levels	
16.8	Broaden the participation of developing countries in the institutions of global governance	
16.9	Provide legal identity for all, including birth registration	
16.10	Ensure public access to information and protect fundamental freedoms, in accordance with national legislation and international agreements	
16.a	Strengthen relevant national institutions, including through international cooperation, for building capacity at all levels, to prevent violence and combat terrorism and crime	
16.b	Promote and enforce non-discriminatory laws and policies for sustainable development	

*The wording of the targets in the above table has been simplified due to space constraints.



©UNOPS

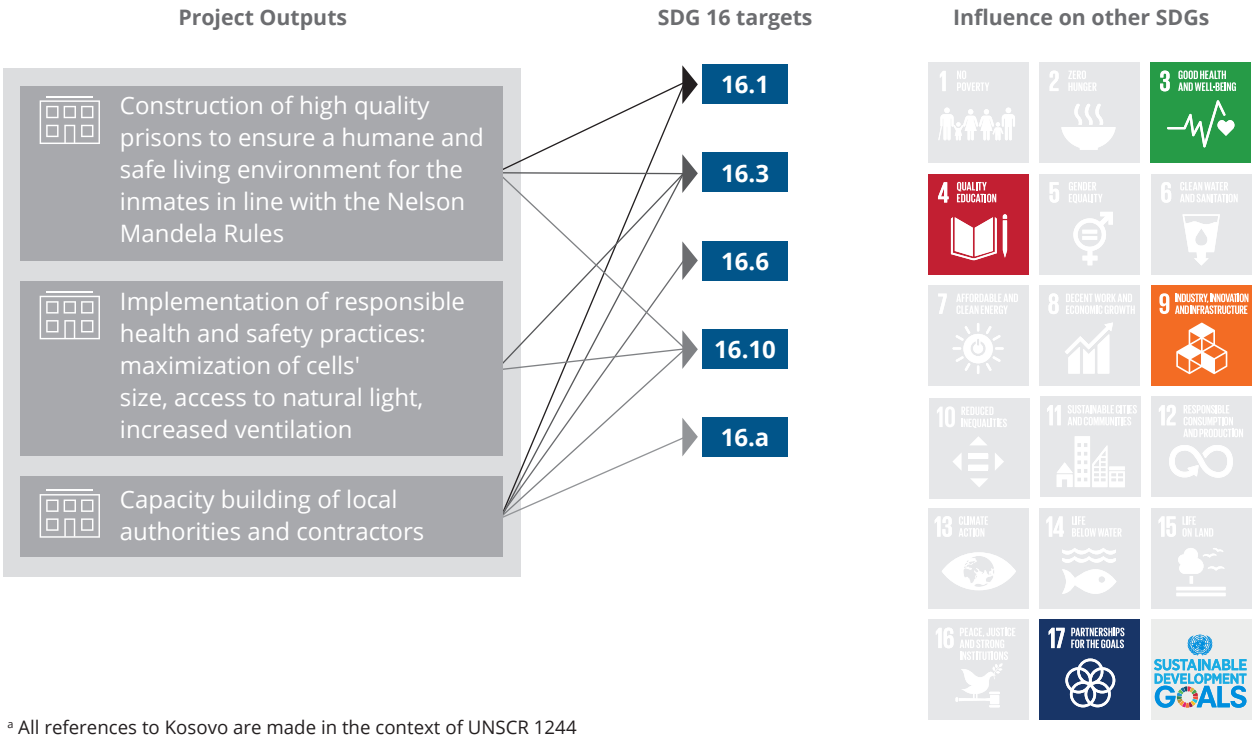
PROJECT: CONSTRUCTION OF HIGH SECURITY PRISON

Location: Kosovo[a] | **Duration:** 2009 - 2012 | **Partners:** European Union, Government of Kosovo

Project Description

UNOPS managed the construction of a high security prison with a capacity for 300 detainees, built to international standards in Kosovo. The facility was designed to accommodate prisoners whose escape would represent a danger to the public or to national security. UNOPS oversaw the construction of the prison, including review of the prison's design completed by a local contractor, and provided procurement and project management support. The project included the training of the facility's staff and offered guidance on maintenance during its first year of operations in order to reduce the upkeep costs and ensure the prison facility's long-term sustainability. The project included the construction of 16 buildings and work areas, including detention blocks, warehouses, medical and educational facilities, and rehabilitation workshops. The project was implemented above the minimal international standards for prison facilities with maximization of the size of cells, access to natural light, increased ventilation, and welfare facilities. The local contractor was also provided training on planning and management of activities, as well as on quality, safety, and environmental management techniques.

Influence of project outputs on SDG 16 targets and other SDGs



[a] All references to Kosovo are made in the context of UNSCR 1244



SDG 17: STRENGTHEN THE MEANS OF IMPLEMENTATION AND REVITALIZE THE GLOBAL PARTNERSHIP FOR SUSTAINABLE DEVELOPMENT

Achieving the ambitious targets of the 2030 Agenda requires a revitalized and enhanced global partnership that brings together Governments, civil society, the private sector, the United Nations system and other actors, mobilizing all available resources.

Strengthening partnerships for the SDGs at the national or international scale requires infrastructure that can facilitate integration through information sharing, knowledge transfer and capacity building[52] incorporating a variety of infrastructure types, including governance, educational and economic infrastructure. The targets for this Goal can also be strongly supported by transportation and digital communications networks that can bring actors together and capitalise on global partnerships to most effectively implement sustainable development policies.

At a national level, mobilising resources for developing countries can benefit from digital technology, such as simplified tax collection through electronic channels that allow governments to raise the funds necessary to implement sustainable development targets. Increasing trade integration through access to international markets can be enhanced by the construction of air and seaports and the road and rail networks that connect them to local producers.[53] Such access infrastructure may overcome particular challenges in landlocked countries, small islands, or rural regions. Through the sharing of technologies, in addition to technical skills training outlined in Goal 4, countries can increase the value added of local production while developing and implementing environmentally sustainable technologies suited to local contexts.

SDG 17 targets with infrastructure influence		Linkages to infrastructure sector
17.1	Strengthen domestic resource mobilization, including support to developing countries, to improve capacity for tax and revenue collection	
17.5	Adopt and implement investment promotion regimes for least developed countries	
17.6	Enhance international cooperation on and access to science, technology and innovation and enhance knowledge sharing	
17.7	Promote the development, transfer, dissemination and diffusion of environmentally sound technologies to developing countries	
17.8	Fully operationalize the science, technology and innovation capacity-building mechanism for least developed countries	
17.9	Enhance support for implementing effective capacity-building in developing countries to support implementation of the SDGs	
17.10	Promote a universal, rules-based, open, non-discriminatory and equitable multilateral trading system	
17.11	Increase the exports of developing countries, in particular with a view to doubling the least developed countries' share of global exports	
17.12	Implement access to a duty-free and quota-free market on a lasting basis for all least developed countries	
17.13	Enhance global macroeconomic stability, including through policy coordination and policy coherence	
17.14	Enhance policy coherence for sustainable development	
17.15	Respect each country's policy space and leadership to establish and implement policies for poverty eradication and sustainable development	
17.16	Enhance the global partnership for sustainable development by mobilizing and sharing knowledge, technology and financial resources	
17.17	Encourage and promote effective public, public-private and civil society partnerships	
17.18	Enhance capacity-building support to developing countries to increase the availability of high-quality, timely and reliable data	
17.19	Build on existing initiatives to develop measurements on sustainable development that complement GDP and support capacity-building	

*The wording of the targets in the above table has been simplified due to space constraints.



©Magnum Photos/Newsha Tavakolian

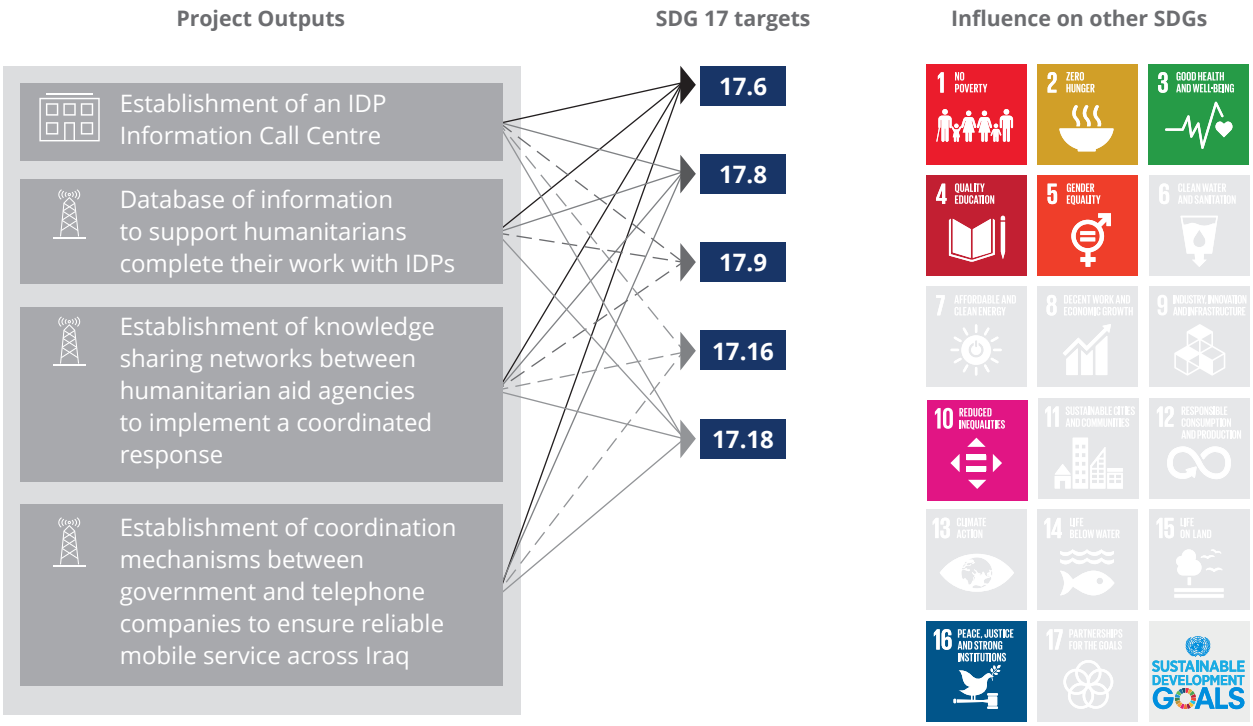
PROJECT: IDP INFORMATION CENTRE

Location: Iraq | **Duration:** 2015 - ongoing | **Partners:** Multiple UN organizations and humanitarian agencies

Project Description

UNOPS has implemented the Internally Displaced Persons (IDP) Information Centre on behalf of global partners, including the UN Refugee Agency (UNHCR), the Iraq Humanitarian Pooled Fund (IHPF), the World Food Programme (WFP), the Office of the United Nations Resident and Humanitarian Coordinator in Iraq, the World Health Organization (WHO), the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) and the European Civil Protection and Humanitarian Aid Operations. The Erbil-based call centre addresses the needs of IDPs from over 3,000 locations in Iraq by connecting them to humanitarian assistance offered by humanitarian aid agencies. Using a toll-free number, displaced people can receive up-to-date information on how to access humanitarian aid based on their needs and priorities, including food, shelter, child protection, government cash grants, and healthcare. More than 120,000 people have called in since the centre opened. To address calls around sensitive topics, the call centre team has received special training on the prevention of sexual abuse and exploitation, gender sensitivity, mine-risk education and child protection. The information received from the calls is shared with various UN organizations and non-governmental organizations to ensure a coordinated response and address service gaps.

Influence of project outputs on SDG 17 targets and other SDGs



*Dashed lines indicate additional project-specific influences on targets beyond the infrastructure sector-based classification outlined in the methodology.

INFLUENCES ACROSS ALL SUSTAINABLE DEVELOPMENT GOALS

As the previous sections have demonstrated, infrastructure systems influence the SDGs in numerous ways, including having an impact on the achievement of up to 92% of all SDG targets. Figure 3 below provides a summary of these influences across all targets of the SDGs for both networked and non-networked infrastructure. On the left side of the figure, networked infrastructure is shown to influence 72% of the 169 targets across all SDGs. This includes all targets for SDG 3: Good health and well-being, SDG 6: Clean water and sanitation, SDG 7: Affordable and clean energy, SDG 9: Industry, innovation and infrastructure, and SDG 11: Sustainable cities and communities. Disaggregating these influences across all SDG targets reveals that water accounts for 37%, energy 43%, transportation 45%, solid waste 21% and digital communications 48%. This broad array of influences emerges due to the vital role networked infrastructure plays in delivering essential services to communities, working as the life-support to many societal functions.

On the right of the figure, non-networked infrastructure is shown to influence 80% of all SDG targets. Like its networked counterpart, this includes all targets of SDG 3: Good health and well-being and SDG 9: Industry, innovation and infrastructure. In addition, non-networked infrastructure influences all targets of SDG 4: Quality education and SDG 16: Peace, justice and strong institutions. The magnitude of influence exemplifies the importance of this type of infrastructure for the achievement of specific SDGs.

Accompanying the classifications of influence are a diverse array of project examples taken from 16 different countries. Each project consists of multiple infrastructure outputs which work together in concert to influence not only the SDG highlighted for the project but also multiple other SDGs. This shows the cross-sectoral and interconnected nature of infrastructure. For example, to advance progress towards SDG 4: Quality education, it is not merely a matter of providing a school (non-networked infrastructure), but also that the school is provisioned with the basic services that networked infrastructure provides. Furthermore, these output types not only include the capacity building of physical assets but also developing the institutions and knowledge that ensure they operate effectively to deliver sustainable infrastructure services.

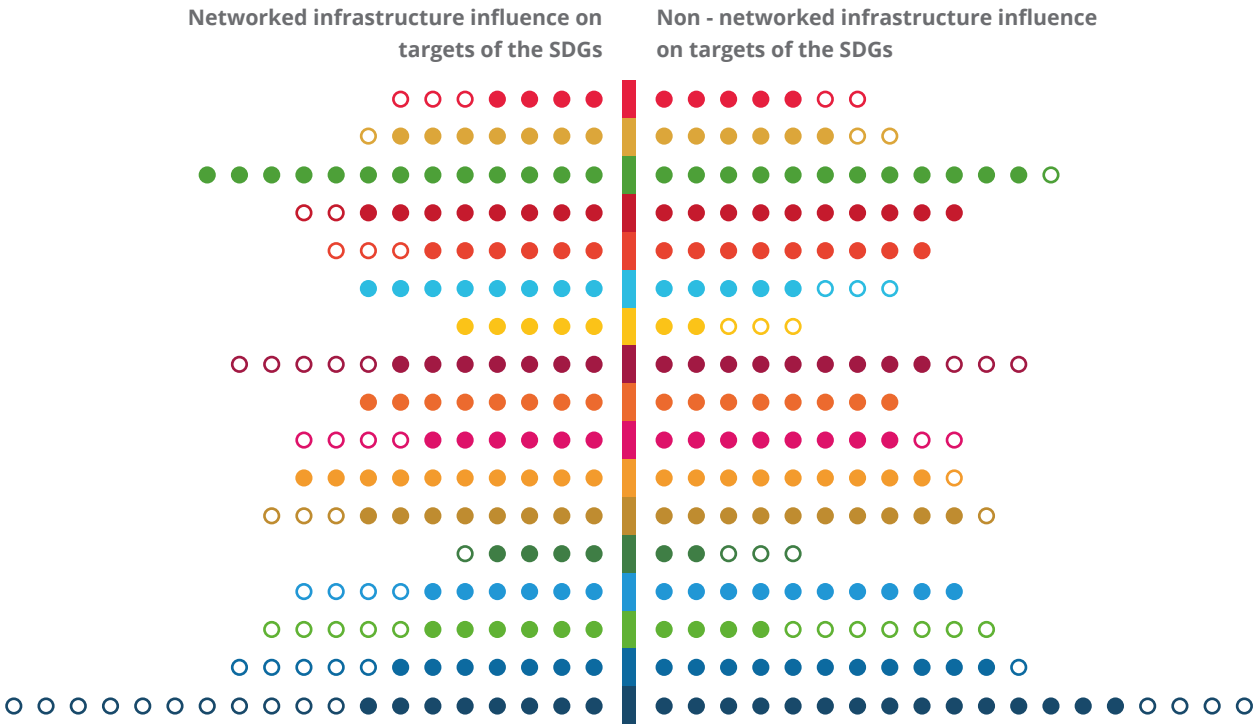


Figure 3: Summary of the influence of networked and non-network infrastructure across all SDGs. Circles represent the individual targets of each SDG. Circles are coloured when they can be influenced by at least one type of infrastructure.

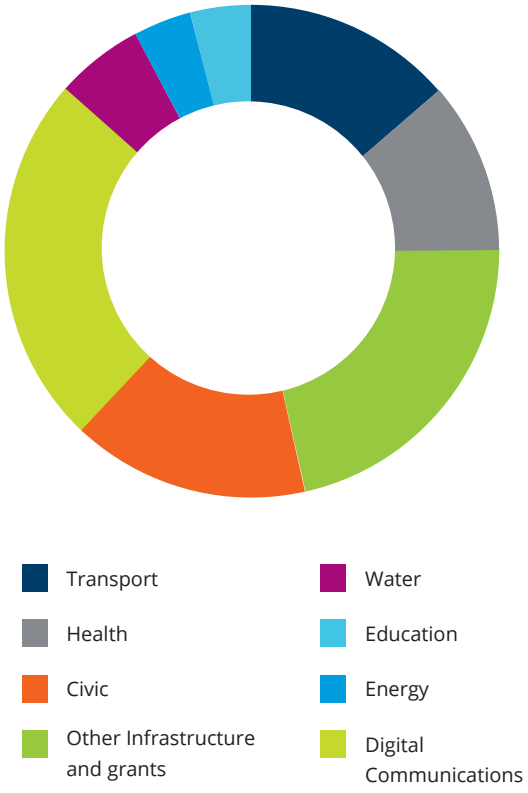
UNOPS AND THE SUSTAINABLE DEVELOPMENT GOALS

Beyond the projects highlighted within this report, UNOPS and its partners implemented $1.78 billion in projects in more than 140 countries in 2017, with nearly 23% of this spending allocated to infrastructure. Of this, almost a quarter (24.8%) supported digital communications outputs, including ICT system installation and data centres. Transport-related infrastructure, including roads, railways, bridges, ports, harbours and airports received over 13%, while water-related infrastructure accounted for nearly 5% **(Figure 4)**.

In addition to networked infrastructure, services provided by non-networked infrastructure such as hospitals, houses and government buildings support a range of societal dimensions and contribute widely to the targets of the 2030 Agenda for Sustainable Development. Such infrastructure accordingly receives large amounts of investment globally: infrastructure serving rule of law and other 'civic' purposes received the largest share of UNOPS non-networked infrastructure spending in 2017, at nearly 18%. Health facilities, including hospitals, clinics and laboratories, received approximately 11%, while educational facilities such as schools and training centres received 4.2%. These facilities nevertheless rely on inputs of energy and water, adequate waste management, and connectivity to users through transportation or digital communications networks in order to provide services necessary to address the SDGs.

The projects presented in this report provide a small representation of the total number of projects implemented by UNOPS every year. By putting sustainability first, UNOPS and its partners are helping to ensure the advancement of the SDGs – providing the foundations for sustainable development.

Figure 4: UNOPS infrastructure expenditure in 2017, highlighting the breakdown of infrastructure project types by sector.



INFRASTRUCTURE FOR SUSTAINABLE DEVELOPMENT

This report both explains and demonstrates the profound influence of infrastructure across all SDGs. In doing so, it shows how infrastructure decisions made now must embed sustainable development considerations, identifying the right types of infrastructure needed to achieve the SDGs. The estimated $97 trillion of investment in infrastructure that is required globally by 2040,[54] represents a massive opportunity to achieve meaningful progress towards this objective.

Despite this potential, poorly planned, implemented or operated infrastructure has many negative consequences for society. This may include the destruction of habitats, overexploitation of resources, creation of pollution, fragmentation of communities, exacerbation of inequalities and creation of vulnerabilities. These consequences are intensified by the unprecedented stresses of rapid urbanisation, economic instability, demographic changes and climate change on already aging infrastructure systems, restricting and curtailing development. The long lifespan and high cost of infrastructure mean that the wrong infrastructure policy and investment choices can lock-in unsustainable practices for decades.[55] With so much at stake, the importance of making the right infrastructure choices, has never been higher.

It is both this responsibility and opportunity that drives UNOPS and its partners to deliver infrastructure that underpins long-term, sustainable and resilient development. To help achieve this future, UNOPS has developed the Evidence Based Infrastructure (EBI) initiative – a holistic approach to the planning, delivery and management of national infrastructure which looks at all components of an infrastructure system, the assets, institutions, and knowledge. It encompasses best-practice processes and state-of-the-art tools that consider the diverse range of social, environmental and economic contexts in which infrastructure systems are embedded.

One of the tools under the EBI initiative, developed with the University of Oxford-led ITRC, is the National Infrastructure Systems Model for International contexts (NISMOD-Int). NISMOD-Int has been developed to simulate the future of national infrastructure, quantifying future infrastructure needs and evaluating investment and policy options to meet those needs. One recent application of the NISMOD-Int, in partnership with the Government of Curacao, revealed imminent challenges to the energy, transport, water, wastewater and solid waste systems, when considering climate change residential population growth and increasing tourism on the island.[56] This analysis led to a prioritized series of complimentary, low-cost, low-regret options, introducing different forms of demand management and cross-ministerial planning to exploit interdependencies and realize systems efficiencies improvements.

Another tool developed under the EBI initiative is the Capacity Assessment Tool for Infrastructure (CAT-I). CAT-I has been developed to assess and identify the gaps of government capacity (at a national, regional, or municipal level) to effectively plan, deliver, and manage sustainable, resilient, inclusive, and human-centred infrastructure systems. It looks at all aspects of the institutions and knowledge components of an infrastructure system. For example, the policies, standards, financial mechanisms, procurement procedures, regulation, enforcement mechanisms, and codes which govern an infrastructure asset's lifecycle. One recent application has been with Mato Grosso State in Brazil where the results from CAT-I have supported the government to update and improve legislation which supports upstream planning to ensure the right assets are being selected and implemented to promote sustainable and resilient development.

Understanding what infrastructure assets a government owns, and what condition they are in, is fundamental to a government's ability to plan and prioritise infrastructure investments. To support governments with the asset component of an infrastructure system and the challenge of asset assessment and management, UNOPS is developing additional tools which include the Database for Evidence Based Infrastructure (DEBI) and FieldSight. DEBI is being developed as a software platform to assist those responsible for the management, operation and maintenance of national infrastructure systems or key infrastructure services with the ability to visualize, oversee and access high level information related to performance and function of national assets. FieldSight, on the other hand, is a data collection tool which also allows field monitoring and quality assurance for infrastructure projects. Developed and tested after the earthquake in Nepal, FieldSight has been used to monitor more than 50,000 sites in country, including houses, WASH, roads, and schools, and is being scaled up throughout the UNOPS network.

Alongside its partners, UNOPS is pioneering a new approach to infrastructure. An approach that looks beyondthe view of infrastructure as physical assets confined to traditional sectoral silos, towards understanding infrastructure as a system-of-systems. An approach that informs infrastructure choices with the best available evidence. An approach necessary to deliver a prosperous and sustainable future for all.

REFERENCES

1. Brundtland GH. 1987. Brundtland, G. (1987). Report of the World Commission on Environment and Development: Our Common Future. [online] Available at: http://www.un-documents.net/our-common-future.pdf [Accessed 21 Sep. 2018].
2. United Nations. 2015. Transforming our World: the 2030 Agenda for Sustainable Development A/RES/70/1. United Nations, New York.
3. Hall JW, Tran M, Hickford AJ, Nicholls RJ. 2016. The Future of National Infrastructure: A System of Systems Approach. Cambridge University Press, Cambridge.
4. Thacker S, Hall JW, Adshead D, et al. 2018. Infrastructure for Sustainable Development. Manuscript under review.
5. United Nations. Report of the world summit for social development. (United Nations, Copenhagen, 1995).
6. Hall, J.W., Tran, M., Hickford, A.J., Nicholls, R.J. The future of national infrastructure: A system of systems approach. Cambridge University Press, Cambridge, UK (2016).
7. United Nations Development Programme. Integrated data and information management for social protection. (United Nations Development Programme, Brasilia, 2015).
8. Llanto, G.M. The impact of infrastructure on agricultural productivity. (Philippine Institute for Development Studies: Discussion Paper Series No.2012-12, Makati City, 2012).
9. Food and Agriculture Organization of the United Nations. The state of agricultural commodity markets, trade and food security: achieving a better balance between national priorities and the collective good. (Food and Agriculture Organization of the United Nations, Rome, 2015).
10. Deichmann, U., Goyal, A., Mishra, D. Will digital technologies transform agriculture in developing countries? Agicultural Economics 47: 21-33 (2016).
11. World Health Organization. Access to Modern Energy Services for Health Facilities in Resource-Constrained Settings (WHO, 2015).
12. Fink, G., Günther, I., Hill, K. The effect of water and sanitation on child health: evidence from the demographic and health surveys 1986–2007, International Journal of Epidemiology, 40:5, 1196–1204 (2011).
13. Johnson, K., Isham, A., Shah, D.V., Gustafson, D.H. Potential Roles for New Communication Technologies in Treatment of Addiction. Curr Psychiatry Rep: 13(5): 390–397 (2011).
14. Briceno-Garmedia, C., Estache, A., Shafik, N. Infrastructure Services in Developing Countries: Access, Quality, Costs and Policy Reform. World Bank Policy Research Working Paper 3468. (World Bank, Washington DC, 2004).
15. International Telecommunication Union. Digital Skills for Decent Jobs. (International Telecommunication Union, Geneva, 2017).
16. World Bank. A water-secure world for all. Water for development: responding to the challenges: Conference edition. World Bank, Washington DC, 2015.
17. Fuso Nerini, F., et al., Mapping synergies and trade-offs between energy and the Sustainable Development Goals. Nature Energy, 2018. 3(1): p. 10-15.
18. Department for International Development. Universal access to sexual and reproductive health services: key Issues guide. Department for International Development, London, 2008.
19. Global Water Partnership. Stockholm, Sweden.
20. Emerton, L., Bos, E. Value. Counting Ecosystems as an Economic Part of Water Infrastructure. IUCN, Gland, Switzerland and Cambridge, UK. 88 pp.
21. EPA. Promoting Technology Innovation for Clean and Safe Water. U.S. Environmental Protection Agency Office of Water, April 2014.
22. World Energy Council. “World Energy Trilemma”. Accessed 9/8/2016. https://www.worldenergy.org/work-programme/strategic-insight/assessment-of-energy-climate-change-policy/.
23. Estache, A. (2006). “Infrastructure: A survey of recent and upcoming issues”. World Bank, Washington D.C.
24. Estache and Garsous (2012) The impact of infrastructure on growth in developing countries. IFC Economics Notes, April 2012.
25. Roelich, K. et al. Towards resource-efficient and service-oriented integrated infrastructure operation. Technological Forecasting and Social Change, 92: 40-52 (2015).
26. Starkey, P.; Hine, J. Poverty and sustainable transport: how transport affects poor people with policy implications for poverty reduction. ODI, London, UK (2014) 72 pp.
27. World Bank. World Development Report: Enabling Digital Development - Digital Finance. (World Bank, Washington DC, 2016).
28. Hall, J.W., Tran, M., Hickford, A.J., Nicholls, R.J. The future of national infrastructure: A system of systems approach. Cambridge University Press, Cambridge, UK (2016).
29. Institute for Development Studies. Knowledge sharing and development in a digital age. (Institute for Development Studies Policy Briefing Issue 87, Brighton, 2015).

30. Shah, M.H. (2014) The Significance of Infrastructure for FDI Inflow in Developing Countries. Journal of Life Economics 2/2014.
31. Wekesa et al. (2017) Effects of Infrastructure Development on Foreign Direct Investment in Kenya. Journal of Infrastructure Development 8(2) 93–110.
32. Riley, Thyra A.; Kulathunga, Anoma. 2017. Bringing E-Money to the Poor: Successes and Failures. Directions in Development—Finance. Washington, DC: World Bank. © World Bank. https://openknowledge.worldbank.org/handle/10986/27944 License: CC BY 3.0 IGO.
33. Ramaswami, A. et al. 2016. Meta-principles for developing smart, sustainable, and healthy cities. Science, 352:6288.
34. DRD. Regional Development Strategy 2035: Building a Better Future. 2010. www.drdni.gov.uk/RDS2035
35. United Nations. Report of the United Nations conference on human settlements (Habitat II). (United Nations, Istanbul, 1996).
36. Starkey, P.; Hine, J. Poverty and sustainable transport: how transport affects poor people with policy implications for poverty reduction. ODI, London, UK (2014) 72 pp.
37. International Energy Agency. World Energy Outlook. Special Report: Energy and Air Pollution. (International Energy Agency, London, 2016).
38. UNISDR (United Nations International Strategy for Disaster Reduction). 2015. Sendai framework for disaster risk reduction 2015–2030.
39. Vojinovic, Z., Hammond, M., Golub, D. et al. Holistic approach to flood risk assessment in areas with cultural heritage: a practical application in Ayutthaya, Thailand. Nat Hazards (2016) 81: 589. https://doi.org/10.1007/s11069-015-2098-7
40. Roelich, K. et al. Towards resource-efficient and service-oriented integrated infrastructure operation. Technological Forecasting and Social Change, 92: 40-52 (2015).
41. UN Food and Agricultural Organisation. “Global Food Loss and Food Waste”. Retrieved 9/8/2018. http://www.fao.org/food-loss-and-food-waste/en/.
42. Parfitt, J., Barthel, M. and Macnaughton, S. Food waste within food supply chains: quantification and potential for change to 2050. Philos Trans R Soc Lond B Biol Sci. 2010 Sep 27; 365(1554): 3065–3081.
43. Saladié, O. & Santos-Lacueva, R. The role of awareness campaigns in the improvement of separate collection rates of municipal waste among university students: A Causal Chain Approach. Waste Management 48 (2016) 48–55.
44. UNISDR (United Nations International Strategy for Disaster Reduction). 2015. Sendai framework for disaster risk reduction 2015–2030.
45. Fuso Nerini, F., et al., Mapping synergies and trade-offs between energy and the Sustainable Development Goals. Nature Energy, 2018. 3(1): p. 10-15.
46. Secretariat of the Convention on Biological Diversity (2009). Scientific Synthesis of the Impacts of Ocean Acidification on Marine Biodiversity. Montreal, Technical Series No. 46, 61 pages.
47. E. Detsis, Y. Brodsky, P. Knudtson, M. Cuba, H. Fuqua, B. Szalai. Project catch: a space based solution to combat illegal, unreported and unregulated fishing: Part I: vessel monitoring system. Acta Astronaut., 80 (2012), pp. 114-123.
48. O’Donoghue, P, Rutz, C. Real-time anti-poaching tags could help prevent imminent species extinctions. J Appl Ecol, 53: 5–10 (2016).
49. SLoCaT (2015) Analysis of the transport relevance of each of the 17 SDGs.
50. Tropina, T. Do Digital Technologies Facilitate Illicit Financial Flows?. World Development Report background papers, World Bank, Washington DC, USA (2016).
51. International Federation of Library Associations and Institutions. Development and Access to Information 2017. International Federation of Library Associations and Institutions, Den Haag, Netherlands (2017).
52. Institute for Development Studies. Knowledge sharing and development in a digital age. (Institute for Development Studies Policy Briefing Issue 87, Brighton, 2015).
53. Bougheasa, S, Demetriadesp, PO, Morgenrothc ELW. Infrastructure, transport costs and trade. Journal of International Economics 47: 169–189 (1999).
54. Global Infrastructure Hub. 2017. Global Infrastructure Outlook 2017, Global Infrastructure Hub, Sydney.
55. Hall JW, Thacker S, Ives MC, et al. 2017. Strategic Analysis of the Future of National Infrastructure. Proceedings of the Institution of Civil Engineers - Civil Engineering, 170:1, 39-47.
56. Adshead D, Fuldauer L, Thacker S, Hickford A, Rouhet G, Muller WS, Hall JW, Nicholls RJ. Evidence-Based Infrastructure: Curacao National infrastructure systems modelling to support sustainable and resilient infrastructure development. 2018, United Nations Office for Project Services: Copenhagen, Denmark.

PO Box 2695
Marmorvej 51
2100 Copenhagen
Denmark
www.unops.org


/unops.org


/company/unops


/unops


/unops_official