



CITY OF CAPE TOWN
ISIXEKO SASEKAPA
STAD KAAPSTAD

20
YEARS | JAHRE



CAPE TOWN-AACHEN MAYOR'S PORTFOLIO OF URBAN SUSTAINABILITY

DAS KAPSTADT-AACHEN PORTFOLIO
DER OBERBÜRGERMEISTER*INNEN
ZU URBANER NACHHALTIGKEIT

Making progress possible. Together.

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Foreword

The cities of Cape Town and Aachen both face complex sustainable development challenges, albeit issues specific to their respective socioeconomic and environmental contexts. Over the past two decades, the Aachen-Cape Town LA21 Partnership has supported the implementation of projects in both cities that promote sustainable development in a practical way, and present creative and innovative solutions to urban sustainability challenges.

The partnership, which is underpinned by the United Nations' sustainable development goals (SDGs), has fostered an enduring and highly collaborative north-south relationship, and has seen both cities working towards and supporting urban sustainability in their respective contexts. Partnership efforts are supported by a committed network of stakeholders in both administrations, as well as a wide range of civil-society, cultural, business and educational institutions from both cities.

Like the Aachen-Cape Town LA21 Partnership, the Mayor's Portfolio of Urban Sustainability also seeks to promote the SDGs and the 2030 Agenda for Sustainable Development. The Mayor's Portfolio has been an important City of Cape Town initiative since 2013. It helps mainstream sustainability thinking, and guides and incentivises project managers to incorporate sustainability principles into their project planning and implementation processes.

This joint Cape Town-Aachen Mayor's Portfolio profiles 22 sustainability projects that are either collaborations between the cities of Aachen and Cape Town, or projects of mutual interest, synergy or similarity between the two cities.

Tracking and analysing the sustainability initiatives undertaken as part of the partnership not only offers important sustainability lessons, but also helps change thinking. This joint Cape Town-Aachen Mayor's Portfolio showcases some of the best practices achieved, while also highlighting areas that require improvement to achieve long-term sustainability in both cities.

Vorwort

Die Stadt Kapstadt und die Stadt Aachen stehen vor komplexen, wenn auch für ihre jeweiligen sozioökonomischen und -ökologischen Kontexte spezifische, Herausforderungen für ihre nachhaltige Entwicklung. Während der letzten zwei Jahrzehnte hat die Aachen-Kapstadt Partnerschaft Projekte in beiden Städten unterstützt, „die eine nachhaltige Entwicklung auf praktischer Ebene fördern“. Projekte, die als Teil der Aachen-Kapstadt Partnerschaft umgesetzt werden, wollen Herausforderungen der urbanen Nachhaltigkeit kreativ und innovativ angehen.

Die Partnerschaft, die von den „Zielen für nachhaltige Entwicklung“ (Sustainable Development Goals, auch SDGs) untermauert wird, hat eine dauerhafte und höchst kooperative Nord-Süd-Beziehung gefördert; innerhalb dieser arbeiten beide Städte auf die Verwirklichung urbaner Nachhaltigkeit in ihrem jeweiligen Kontext hin und unterstützen diese. Die Partnerschaft wird von Engagierten in beiden Stadtverwaltungen getragen und einem breiten Netzwerk aus zivilgesellschaftlichen, kulturellen, wirtschaftlichen Akteuren und Bildungseinrichtungen in beiden Städten.

Wie die Aachen-Kapstadt Partnerschaft, zielt auch das „Das Kapstadt-Aachen Portfolio der Oberbürgermeister*innen zu urbaner Nachhaltigkeit“ darauf ab, die nachhaltige Entwicklung und Agenda 2030 zu fördern. Das „Mayor's Portfolio“ ist seit 2013 eine

wichtige Initiative der Stadt Kapstadt. Das Programm trägt dazu bei, Nachhaltigkeitsdenken in die eigene Arbeit einzubinden und regt Projektmanager*innen an, die Nachhaltigkeitsprinzipien in Planungs- und Umsetzungsprozesse zu integrieren.

Das gemeinsame „Cape Town -Aachen Mayor's Portfolio of Urban Sustainability“ stellt 22 solcher Projekte vor. Die Publikation stellt Kooperationsprojekte zwischen der Stadt Aachen und der Stadt Kapstadt vor, Projekte von gegenseitigem Interesse oder Projekte, die Synergien beinhalten bzw. ähnliche Ansätze beider Städte hervorheben.

Abgesehen davon, dass es wertvoll ist, die im Rahmen der Partnerschaft unternommenen Nachhaltigkeitsinitiativen zu verfolgen, können aus diesen Kooperationsprojekten wichtige Erkenntnisse gewonnen werden. Die Analyse dieser Projekte trägt auch zum Umdenken bei und ermutigt Projektmanager*innen in beiden Städten, sowie auch zivilgesellschaftliche Akteure Nachhaltigkeitsparameter in ihre Arbeit einzubeziehen. Dieses gemeinsame „Das Kapstadt-Aachen Portfolio der Oberbürgermeister*innen zu urbaner Nachhaltigkeit“ stellt einige „best practice“-Beispiele vor und zeigt zugleich Bereiche in beiden Städten auf, die verbessert werden müssen, um langfristig Nachhaltigkeit zu erreichen.



A message from the Executive Mayor of Aachen, Sibylle Keupen

Sustainability is on everyone's lips. The principle seems easy to explain, yet we struggle with how to consistently integrate sustainability principles into our daily work and projects.

I am therefore very pleased to present to you, together with my colleague Executive Mayor Dan Plato, the "Cape Town-Aachen Mayor's Portfolio of Urban Sustainability". In it, you will find 22 project examples from the twin cities of Cape Town and Aachen, in which the topic of sustainability was the guiding principle.

These projects either originate directly from the activities of the city partnership, the city administrations or are thematically interesting for the other city or have a high potential for transferability.

The Aachen-Cape Town partnership has been alive for more than 20 years and is supported by a broad network in both municipalities. The goal has always been to initiate and implement projects that are based on the principles of sustainability - initially in line with the goals of Agenda 21, updated by the goals of Agenda 2030.

Looking at the issues of climate protection, biodiversity and social justice, our challenge has grown even further since the introduction of the SDGs.

The Coronavirus pandemic, in particular, has been presenting our world with a challenge of the century for more than a year now. This crisis poignantly shows us how fragile our globally interconnected public life is. Whether the pandemic impedes or promotes sustainable development is currently being debated and researched. One thing is clear, however: The need for rapid action has grown, not only but especially in the areas of poverty reduction and health.

We need to find solutions for rapid transformation toward sustainability. To take these big steps and make progress, we need to plan together and act together. We are in a time when global and local action are closely intertwined.

That is why I strongly support the long-standing partnership relationship between Aachen and Cape Town. Never has the potential to learn from and with each other been greater than it is today, and never has it been more important.

As different as our cities are, and thus our respective challenges; we share our goal of a sustainable future. I am deeply convinced to learn from the principles of twinning "from each other at eye level". The "Cape Town-Aachen Mayor's Portfolio of Urban Sustainability" offers a wonderful opportunity to build on this and take further steps towards our shared vision.



Vorwort der Aachener Oberbürgermeisterin, Sibylle Keupen

Nachhaltigkeit ist in aller Munde. Das Prinzip scheint leicht erklärbar und doch ringen wir darum, wie wir Nachhaltigkeitsprinzipien konsequent in unsere tägliche Arbeit und Projekte integrieren.

Ich bin daher sehr erfreut, Ihnen gemeinsam mit meinem Kollegen Oberbürgermeister Dan Plato „Das Kapstadt - Aachen Portfolio der Oberbürgermeister*innen zu urbaner Nachhaltigkeit“ zu präsentieren. Denn in diesem finden sie 22 Projektbeispiele aus den Partnerstädten Kapstadt und Aachen, bei denen das Thema Nachhaltigkeit handlungsleitend war.

Diese Projekte entstammen entweder direkt den Aktivitäten der Städtepartnerschaft, den Stadtverwaltungen oder sind thematisch für die jeweils andere Stadt interessant bzw. haben ein hohes Potential an Übertragbarkeit.

Die Aachen-Kapstadt Partnerschaft ist bereits seit über 20 Jahren lebendig und wird von einem breiten Netzwerk in beiden Kommunen getragen. Das Ziel war stets Projekte zu initiieren und durchzuführen, denen die Prinzipien der Nachhaltigkeit - zunächst im Einklang mit den Zielen der Agenda 21, aktualisiert durch die Ziele der Agenda 2030 - zugrunde liegen.

Wenn wir auf die Themen Klimaschutz, Biodiversität und soziale Gerechtigkeit blicken, dann ist unsere Herausforderung seit Einführung der SDGs noch weiter gewachsen.

Vor allem die Corona-Pandemie stellt unsere Welt nun seit über einem Jahr vor eine Jahrhundertherausforderung. Diese Krise zeigt uns eindringlich, wie fragil unser global vernetztes, öffentliches Leben ist. Ob die Pandemie die nachhaltige Entwicklung erschwert oder befördert, wird derzeit diskutiert und erforscht. Eines ist allerdings klar: Die Notwendigkeit zum schnellen Handeln ist gewachsen, nicht nur, aber besonders in den Bereichen der Armutsbekämpfung und Gesundheit.

Wir müssen Lösungen finden für eine schnelle Transformation in Richtung Nachhaltigkeit finden. Um diese großen Schritte zu gehen und Fortschritte zu erzielen, müssen wir gemeinsamen planen und gemeinsam handeln. Denn befinden uns in einer Zeit, in der globales und lokales Handeln aufs Engste miteinander verwoben sind.

Daher unterstütze ich die langjährige Partnerschaftsbeziehung zwischen Aachen und Kapstadt. Nie war das Potential voneinander und miteinander zu lernen größer als heute und nie war es wichtiger.

So unterschiedlich unsere Städte sind und damit auch unsere jeweiligen Herausforderung; unser Ziel einer nachhaltigen Zukunft teilen wir. Ich bin zutiefst überzeugt, von den Prinzipien der Städtepartnerschaft „voneinander auf Augenhöhe“ zu lernen.

„Das Kapstadt - Aachen Portfolio der Oberbürgermeister*innen zu urbaner Nachhaltigkeit“ bietet dazu eine wunderbare Gelegenheit und die Möglichkeit, hieran anzuknüpfen und weitere Schritte in Richtung unserer gemeinsamen Vision zu gehen.



A message from the former Executive Mayor of Aachen, Marcel Philipp

I am very pleased that the project of a joint sustainability brochure of the twin cities of Aachen and Cape Town has been realised for the first time. The idea was born in 2019, during the Aachen delegation trip to Cape Town. At the time, Mayor Plato asked me at the launch of the Mayor's Portfolio of Urban Sustainability - in front of an admittedly large audience - whether we would implement this project.

Even though my term in office is in the past, I am still particularly pleased to hold this joint portfolio in my hands.

From the beginning, the Aachen-Cape Town partnership has been characterised by its commitment to sustainability. Initially known as Agenda 2021 goals, now as the SDGs - sustainable development remains structurally at the heart of this partnership and are evident in all the projects that have been realised within the partnership. This jointly published brochure also focuses on the SDGs, highlights projects from both cities and will hopefully provide an opportunity for new points of contact, ideas and future cooperation.

I am very pleased about this publication and wish you an interesting and inspiring read.

Ein Grußwort des Aachener Oberbürgermeisters a.D., Marcel Philipp

Ich freue mich sehr, dass das Projekt einer gemeinsamen Nachhaltigkeitsbroschüre der Partnerstädte Aachen und Kapstadt erstmalig realisiert worden ist. Die Idee wurde 2019 geboren, bei der Aachener Delegationsreise nach Kapstadt. Bürgermeister Dan Plato hat mich damals bei der Herausgabe des Kapstädter Mayor's Portfolio of Sustainability - vor zugegebenermaßen großem Publikum - gefragt, ob wir dieses Projekt gemeinsam realisieren.

Auch wenn meine Amtszeit in der Vergangenheit liegt, so freue ich mich dennoch besonders, dieses gemeinsame Portfolio nun in den Händen zu halten.

Die Aachen-Kapstadt Partnerschaft zeichnete sich von Anfang an aus durch Ihr Engagement für die Nachhaltigkeit. Anfangs als Agenda 2021-Ziele, nun als SDG - die Themen der nachhaltigen Entwicklung lagen und liegen dieser Partnerschaft strukturell zugrunde und zeigen sich in allen realisierten Partnerschaftsprojekten. Auch diese gemeinschaftlich herausgegebene Broschüre legt seinen Fokus auf die Sustainable Development Goals, zeichnet Projekte aus beiden Städten aus und wird hoffentlich Anlass bieten für neue Anknüpfungspunkte, Ideen und zukünftige Kooperationen.

Ich freue mich über die Herausgabe und wünsche Ihnen eine interessante und inspirierende Lektüre.



A message from the Executive Mayor of the City of Cape Town, Dan Plato

I firstly wish to extend my congratulations to Sibylle Keupen on her landmark election as the Lord Mayor of the City of Aachen on 27 September 2020. I am eager to work with the Lord Mayor in strengthening and deepening the friendship, cooperation and success of the enduring partnership between our two cities.

The Aachen-Cape Town LA21 Partnership is a true example of a successful, meaningful and sustainable city-to-city partnership. Over the past 20 years, the City of Cape Town and City of Aachen have cultivated a deeply cooperative north-south relationship. Importantly, we have cultivated a common purpose and shared vision; the pursuit of sustainability in a complex world.

As with the Aachen-Cape Town LA21 Partnership, the Mayor's Portfolio of Urban Sustainability also seeks to promote the realisation of the Sustainable Development Goals, and has played an important role in mainstreaming sustainability principles into project planning and implementation. At the launch of the third edition of the Mayor's Portfolio, in 2019, our cities agreed to collaborate on developing a portfolio of projects that showcase and celebrate the partnership and the projects that have been realised through our collaboration. This publication is the culmination of that commitment between our partner cities.

Through over 1 000 exchanges, together we have discovered innovative ways of collaborating and supporting each other in relation to a wide range of sustainability initiatives. This joint Cape Town-Aachen Mayor's Portfolio showcases and celebrates the partnership and the many projects that have been realised through our collaboration. These include

school exchanges; the design of the proposed HlUMANI community centre; support for the management and protection of the African penguin in Cape Town; the Aachen Climate Ticket; and the Good Hope Lab (an international university collaboration on urban sustainability). Further, many other successful initiatives, that are not showcased in this publication, have been supported through the partnership including the Guga S'Thebe Arts and Cultural Centre, a bicycle recycling project, and the ASA-GLEN internship.

Cape Town confronts a range of sustainability challenges that are rooted in its unique socio-economic and environmental context. However, we live in an increasingly interconnected world and many of the sustainability challenges we face are global in nature, such as climate change and the ongoing Covid-19 pandemic. The lessons, collaboration and support we have received from our sister city has and continues to assist us in navigating these complex challenges. Notably, we are embedding the principles and lessons we have learnt through the partnership in our service delivery and in the implementation of priorities of our Integrated Development Plan (IDP), such as the regeneration of the Bellville CBD.

We have come a long way since our partnership was established. As demonstrated through this publication, the partnership has enabled us to achieve remarkable things together. The City of Cape Town is committed to future collaboration with the City of Aachen and to deepening our cooperation, exchange of knowledge, and mutual support. I look forward to continuing this journey with the City of Aachen, as we move towards a more sustainable future.

Introduction: Partnering for sustainable development

This year marks the 20th anniversary of the partnership between Cape Town and Aachen, which was originally linked to the United Nations' Agenda 21. The memorandum of understanding (MoU) was signed by both local governments, as well as participating civil-society, cultural, business and education institutions from both cities. These included the Khayelitsha Education Resource and Information Centre (KERIC), Welthaus, BECO, VIKA, and Ilitha Labantu. Since then, the Aachen-Cape Town LA21 Partnership has grown to incorporate more organisations, and formal structures have been established to implement and coordinate joint projects.

As the MoU was originally concluded between Aachen and the then City of Tygerberg, the need to revise the partnership to reflect the formation of the "Unicity" (City of Cape Town) emerged in 2002, when a Cape Town delegation visited Aachen to develop new project areas. Following a return visit to Cape Town by an Aachen delegation in 2003, a second MoU was signed by both cities and civil-society representatives on the steering committee in 2004. In 2007, the MoU was converted into a memorandum of agreement (MoA), which was signed in 2012 and revised and renewed in November 2017.

Over these past 20 years, the Aachen-Cape Town LA21 Partnership has been supporting practical projects that emphasise and promote sustainable development as part of everyday life in both cities. Based on the principles of Agenda 21, the partnership has fostered strong north-south collaboration to realise urban sustainability. According to the MoA, the goal of the partnership is to "promote local sustainable development in the sense

of Agenda 21 and the SDGs through proposals that make ecological, social and economic conditions and sustainable action visible on a local level". This includes promoting opportunities for exchanges between Aachen and Cape Town, and creating and maintaining platforms to promote contact for sustainable development.

The Mayor's Portfolio of Urban Sustainability has been an important City of Cape Town initiative since 2013. To date, the programme has produced four publications (2014, 2016, 2018 and 2020), contributing to mainstreaming sustainability thinking by guiding and incentivising project managers to incorporate sustainability principles into their project planning and implementation processes. Like the Aachen-Cape Town LA21 Partnership, the Mayor's Portfolio also seeks to promote the realisation of the SDGs and the 2030 Agenda for Sustainable Development.

At the launch of the third edition of the Mayor's Portfolio in March 2019, Executive Mayor Dan Plato issued a "challenge" to Aachen to collaborate with Cape Town on a portfolio of projects similar to those of the Mayor's Portfolio, to which Aachen's Lord Mayor Marcel Philipp agreed. This joint Cape Town-Aachen Mayor's Portfolio is intended as a meaningful contribution to the objectives and goals of the partnership. The publication showcases a sample of initiatives and projects that have been realised through the partnership, and provides an opportunity for the continued exchange of sustainability knowledge and lessons between the two cities. Moreover, it helps deepen networks and relationships between the partner cities.

The 22 projects showcased are either collaborations between the cities of Aachen and Cape Town, or projects of mutual interest, synergy or similarity between the two cities. Many are led by the cities of Cape Town or Aachen, while others are managed by stakeholders from civil-society, cultural, business and education institutions that form part of the Aachen-Cape Town LA21 Partnership, with support from both local governments. All projects are also closely aligned with, and seek to further, one or more of the SDGs and the 2030 Agenda for Sustainable Development.

The 2018 Good Hope Lab (p. 41) engaged students in an intense peer-to-peer learning experience to explore the potential of urban agriculture as a catalyst for sustainable development and social cohesion.



Einführung: Partnerschaft für Nachhaltige Entwicklung

2020 markierte das 20 jährige Jubiläum der Partnerschaft zwischen Kapstadt und Aachen, die ursprünglich als Agenda 21-Partnerschaft entstanden ist. Die Absichtserklärung (Memorandum of Understanding) wurde von beiden Stadtverwaltungen, unter Einbeziehung der teilnehmenden zivilgesellschaftlichen, kulturellen, wirtschaftlichen und bildungsbezogenen Institutionen aus beiden Städten, unterzeichnet. Daran beteiligt waren das Khayelitsha Education and Information Centre (KERIC), das Aachener Welthaus, BECO, VIKA und Ilitha Labantu. Seitdem ist die Aachen-Kapstadt Partnerschaft um weitere Organisationen gewachsen und es wurden formale Strukturen geschaffen, um die Umsetzung und Koordination gemeinsamer Projekte zu erleichtern.

Im Jahr 2002 besuchte eine Delegation aus Kapstadt Aachen, um neue Projektbereiche zu entwickeln, wobei die Notwendigkeit bestand, die Partnerschaft zu überarbeiten, um die neue Unicity (Stadt Kapstadt) mit einzubeziehen. In der Folge besuchte eine Aachener Delegation 2003 Kapstadt, und 2004 wurde eine zweite Absichtserklärung von beiden Städten und Vertretern der Zivilgesellschaft im Lenkungsausschuss unterzeichnet. Im Jahr 2007 wurde das MoU in ein Memorandum of Agreement (MoA) geändert, welches 2012 unterzeichnet und im November 2017 aktualisiert und erneuert wurde.

Während der letzten 20 Jahre hat die Aachen-Kapstadt Partnerschaft „praktische, alltagsnahe Projekte“ unterstützt, die nachhaltige Entwicklung in beiden Städten betonen und fördern. Die Partnerschaft, die auf den Prinzipien der Agenda 21 basiert, fördert eine kooperative Nord-Süd-Beziehung, um gemeinsam an der Verwirklichung

städtischer Nachhaltigkeit zu arbeiten. Laut MoA ist das Ziel der Partnerschaft, „lokale nachhaltige Entwicklung im Sinne der Agenda 21 und der Sustainable Development Goals (SDGs) durch Vorschläge zu fördern, die ökologische, soziale und wirtschaftliche Bedingungen und nachhaltiges Handeln auf lokaler Ebene sichtbar machen“. Dieses Ziel beinhaltet Austauschmöglichkeiten zwischen Aachen und Kapstadt sowie die Schaffung und Pflege von Plattformen zur Förderung des Kontakts für eine nachhaltige Entwicklung.

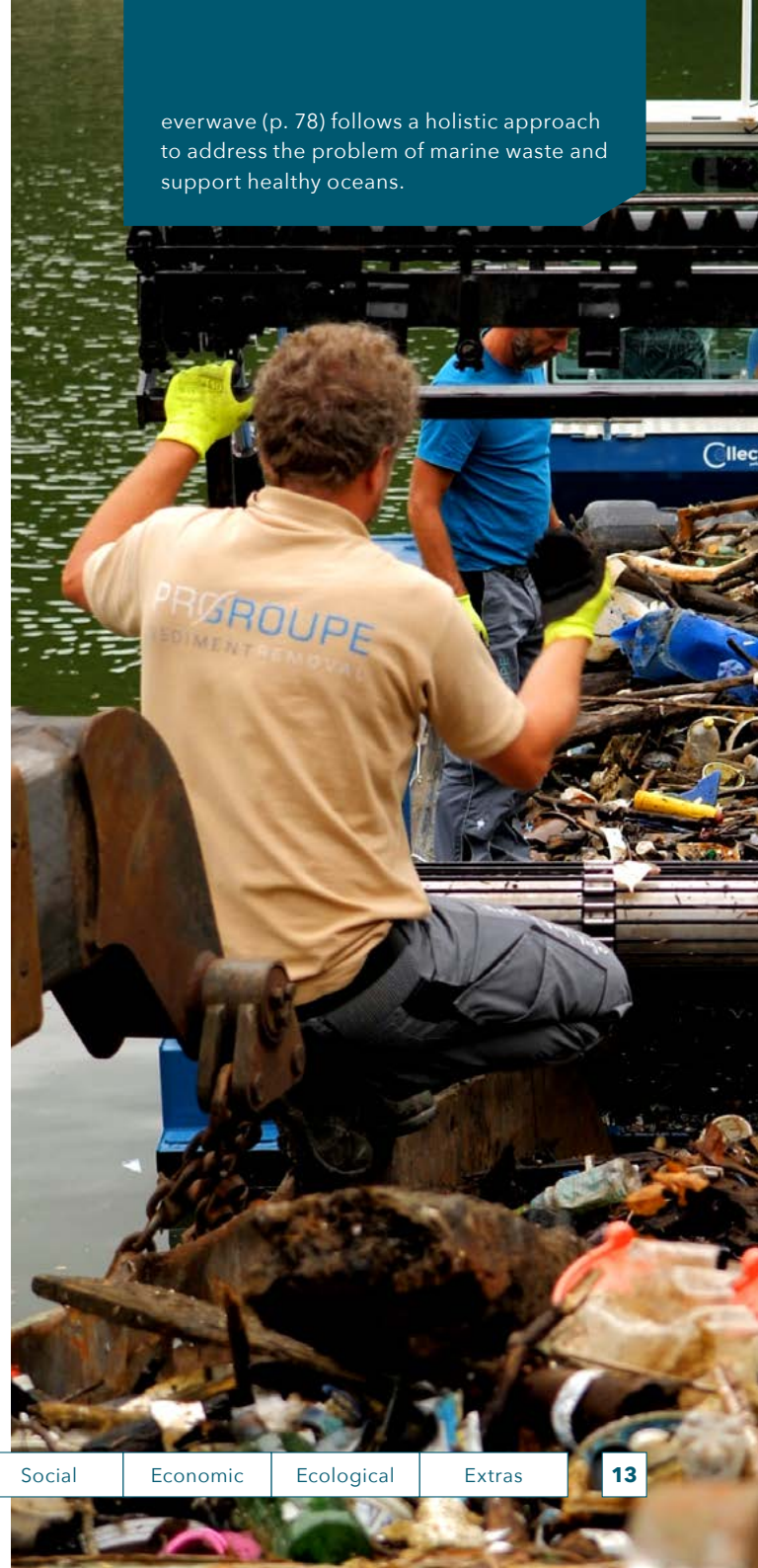
Das „Mayor’s Portfolio of Sustainability“ ist seit 2013 eine wichtige Initiative der Stadt Kapstadt. Bis heute hat das Programm vier Publikationen hervorgebracht (2014, 2016, 2018 und 2020) die dazu beitragen, das Nachhaltigkeitsdenken zu verankern, indem sie Projektmanager*innen anleiten und anspornen, Nachhaltigkeitsprinzipien in ihre Planungs- und Umsetzungsprozesse einzubeziehen. Wie die Aachen-Kapstadt Partnerschaft, so zielt auch das „Mayor’s Portfolio of Sustainability“ darauf ab, die Umsetzung der SDGs und der Agenda 2030 zu befördern.


Bei der Einführung der dritten Auflage der Publikation im März 2019 hat Bürgermeister Plato Aachen „herausgefordert“, mit Kapstadt an einem Portfolio von Projekten auf ähnlicher Basis wie das „Mayor’s Portfolio“ zusammen zu arbeiten. Oberbürgermeister Philipp nahm diese Herausforderung an. Dieses gemeinsame Portfolio soll einen sinnvollen Beitrag zu den Zielen der Partnerschaft leisten. Die Publikation zeigt eine Auswahl von Initiativen und Projekten, die zum Teil durch die Partnerschaft verwirklicht wurden bzw. die

Möglichkeit eröffnen, Erfahrungen und Wissen zum Thema Nachhaltigkeit zwischen unseren Städten auszutauschen und zu einer Vertiefung der Netzwerke und Beziehungen zwischen den Partnerstädten beizutragen.

Bei den 22 vorgestellten Projekten handelt es sich um Kooperationsprojekte zwischen Aachen und Kapstadt, um Projekte von beiderseitigem Interesse für beide Städte oder um Projekte, die Synergien beinhalten oder ähnliche Ansätze beider Städte hervorheben. Insbesondere werden Projekte vorgestellt, die von der Stadt Kapstadt oder der Stadt Aachen geleitet werden, sowie Partnerschaftsprojekte, d.h. solche, die von Akteuren aus der Zivilgesellschaft, Kultur, Wirtschaft und Bildungseinrichtungen geleitet werden, die zur Aachen-Kapstadt Partnerschaft gehören und von beiden Stadtverwaltungen unterstützt werden. Darüber hinaus sind alle Projekte eng an einem oder mehreren Zielen der Nachhaltigkeitsentwicklung (SDGs) und Agenda 2030 ausgerichtet und versuchen, diese Ziele voranzubringen. Ganz im Sinne der der Aachen-Kapstadt Partnerschaft, werden durch diese Projekte „die ökologischen, sozialen und ökonomischen Bedingungen und nachhaltiges Handeln auf lokaler Ebene sichtbar“.

everwave (p. 78) follows a holistic approach to address the problem of marine waste and support healthy oceans.





Overview:
Key elements
of the portfolio

Background to the Aachen-Cape Town LA21 Partnership

The first MoU to cement the partnership was signed in Aachen on 29 June 2000, shortly before the formation of the “Unicity” or, as it is today known, the City of Cape Town. The MoU was signed by both the City of Aachen and the then City of Tygerberg, along with participating civil-society, cultural, business and education institutions from both cities. These included the Khayelitsha Education Resource and Information Centre (KERIC), Welthaus, BECO, VIKA, and Ilitha Labantu. Since then, the Aachen-Cape Town LA21 Partnership has grown to incorporate more organisations, and formal structures were put in place to implement and coordinate joint projects. In 2002, a Cape Town delegation visited Aachen to develop new project areas, during which visit the need arose to revise the partnership to reflect the establishment of the unified City of Cape Town (Unicity). After an Aachen delegation paid a return visit to Cape Town in 2003, a second MoU was signed by both cities and civil-society representatives on the steering committee in 2004. The MoU was converted into an MoA in 2007, signed in 2012, and revisited and renewed in November 2017.

The Aachen-Cape Town LA21 Partnership, which was initially based on the principles of Agenda 21, has been supporting practical projects that emphasise and promote sustainable development as part of everyday life in both cities. A true example of successful, meaningful and sustainable city-to-city collaboration, the initiative has seen over 1 000 exchanges between the two partner cities and has led and supported various successful projects in Cape Town.

This highly cooperative north-south relationship has meaningfully supported efforts to achieve urban sustainability in both cities, in keeping with the commitment made by the two cities in the MoA, namely to “strengthen and deepen their friendship, cooperative relationship and successful cooperation”. Also captured in the MoA are the partnership plans, which include:

- projects that emphasise and promote sustainable development;
- raising awareness and promoting understanding of the Agenda 21 millennium development goals (which have since been superseded by the SDGs) in the north-south relationship;
- promoting opportunities for exchanges between Aachen and Cape Town; and
- creating and maintaining an internet-supported networking platform to promote contact for sustainable development.

The key areas of collaboration, aligned with specific SDGs, are:

- the green economy and ecological development (SDGs 8 and 1);
- participation, improved engagement and good governance (SDGs 10 and 11);
- water and waste management (SDGs 11 and 12);
- safe and clean cities (SDG 11);
- renewable energy, climate change and energy-saving construction (SDGs 13 and 7);

Premium Ways (p. 81) is a network of high-quality walkways connecting small district squares and green oases along short routes to promote walkability.

- city climate and urban green spaces (SDG 11);
- city planning, traffic planning and transportation (SDG 11);
- raising awareness of and educating on sustainable development (SDG 4); and
- cross-cutting issues (women, youth, sports, culture, school partnerships, exchange programmes, inclusion, etc.) (SDGs 11, 5 and 17).

The principle participation is embedded in the partnership. In this regard, the MoA specifically states:

“By having all participants participate as equals, joint cooperation will be ensured. To promote active participation in society, city councils, civil society (= associations, NGOs), educational and funding institutions, businesses, universities and other interested groups will all work together (SDG 16).”

The MoA further highlights, among others, the commitment to coordinate and link projects and activities, organise partnership events, take on tasks in the public and communications sectors, and promote work exchanges, education and the sharing of knowledge and experience with other cities. Since the start of the partnership, the cities of Aachen and Cape Town have collaborated on many practical projects that pursue sustainable development in both cities. While this joint Mayor’s Portfolio showcases some of these, it represents but a sample of the scope of collaboration under the Aachen-Cape Town LA21 Partnership.¹

¹ Further information on the history and development of the partnership, as well as on past and current partnership projects, is available online at <http://en.aachen-kapstadt.de/>.



Evaluation of projects

Past editions of the City of Cape Town Mayor's Portfolio of Urban Sustainability assessed projects according to 12 sustainability objectives or criteria (see portfolio extra 1), and applied a formal assessment algorithm. This joint Cape Town-Aachen Mayor's Portfolio, however, does not include formal project evaluations. Instead, a qualitative approach has been followed, using the 12 sustainability objectives or criteria as a guide for unpacking and describing the projects.

The evaluation of projects was further underpinned and guided by the SDGs and associated indicators. The SDGs and the 2030 Agenda for Sustainable Development, which all United Nations (UN) member states adopted in 2015, aim to promote a better and more sustainable future for all. The SDGs are a universal call to action to "end poverty, protect the planet and improve the lives and prospects of everyone, everywhere". In particular, goal 11, "Sustainable cities and communities", aims to "[m]ake cities and human settlements inclusive, safe, resilient, and sustainable". Notably, the Aachen-Cape Town LA21 Partnership is based on the principles of Agenda 21 and the SDGs, and an overall goal of the partnership is to promote local sustainable development in the sense of Agenda 21 and the SDGs through proposals that make ecological, social and economic conditions and sustainable action visible on a local level.

Both Cape Town and Aachen have started processes to adapt the indicators, targets and objectives of the SDGs to their respective local socioeconomic and environmental contexts, and have committed to implementing the SDGs. The City of Cape Town is in the process of localising the SDGs through, among others, developing an SDG implementation plan, establishing a cross-departmental SDG task team, and working towards aligning its Integrated Development Plan (IDP) 2022-2027 with the 2030 Agenda for Sustainable Development.² Aachen, in turn, has been working on the principle of sustainable development for over 20 years. In 2018, the city council decided to develop a sustainability strategy to advance the SDGs in a broad alliance with local actors and citizens. Moreover, the City of Aachen was recognised as one of the three "most sustainable" cities in Germany in the 2018 German Sustainability Awards.

As such, both the 12 sustainability objectives or criteria and the SDGs were used to select and examine projects for this portfolio. Instead of the usual "Evaluation" section, each project profile includes a "Sustainability lessons" section, which connects the project to the sustainability criteria and the SDGs. In terms of the latter, each project profile is attached to one or more of the SDGs, as represented by the relevant SDG icon(s). At the same time, the "Sustainability lessons" section outlines challenges, successes and opportunities in relation to embedding sustainability in project planning and implementation, and provides a space to explore synergies, linkages, lessons and opportunities for Cape Town and Aachen respectively.

² Croese, S. with Wright C. and Primo, N. 2019. Localisation of the 2030 Agenda and its Sustainable Development Goals in Cape Town.

Selection and profiling of projects

For this joint Cape Town–Aachen Mayor’s Portfolio, the project team consulted with Aachen–Cape Town LA21 Partnership representatives to preselect projects to profile. Preselected projects were nevertheless assessed against the broad benchmarks, although these had been adapted from previous portfolio editions to meet the requirements of this joint Mayor’s Portfolio.

Typically, preselected projects:

- were under way or recently completed, or were new and active phases of older projects;
- addressed socioeconomic and environmental issues in an integrated manner and in a framework of good governance, thereby encompassing the principles of sustainability;
- were making a positive difference in their sector, while also crossing sector boundaries and working transversally;
- were innovative or original in their approach;
- demonstrated collaboration and partnership-building;
- empowered Aachen or Cape Town communities, whether with skills, employment, connections and networks, or knowledge transfer, including empowering employees of the respective local governments with improved thinking, operational strategies and modes of work; and
- encouraged replication through ease of process, creative or cost-effective use of resources, and being true examples of practical ways to achieve sustainability.

The identified projects also had to contribute to the goals of the Aachen–Cape Town LA21 Partnership, as outlined in the MoA, by:

- emphasising and promoting sustainable development;
- raising awareness and promoting understanding of the 2030 Agenda for Sustainable Development and the SDGs; and
- providing an opportunity for knowledge exchange between Aachen and Cape Town.

After the projects were selected, project managers were interviewed to obtain the necessary project information. While formal assessments were not undertaken, the assessment tables and 12 sustainability objectives or criteria were used to guide interviews, and as a tool to unpack the sustainability dimensions of projects. These interviews formed the basis of the project profiles, which summarise some of the key features of each project. In addition, the interviews provided a platform to unpack challenges, successes and opportunities in project planning and implementation, and to explore synergies, links and potential lessons to share between Cape Town and Aachen. Project managers were invited to review their respective profiles, and to further unpack sustainability lessons learnt.

Portfolio sections

Vision portfolio

Projects that form part of the vision portfolio have achieved substantial outcomes through innovative and visionary planning. This section also includes participatory initiatives and outreach programmes aimed at promoting sustainability through behaviour change and the application of innovative design-led processes that stimulate a paradigm shift in urban sustainability and service delivery.

All the projects in the vision portfolio are characterised by:

- exemplary foresight;
- inclusive and thorough planning and design; and
- commitment to sustainability principles.

While these projects may lead to future “on-the-ground” developments, they currently still lack tangible outputs.

Social portfolio

The projects in this section have a strong social component. Most of them have entailed extensive community involvement in developing processes and structures. While promoting sustainability as an overall outcome, the projects in this category were originally motivated by the need to address a social problem that had arisen in Cape Town or Aachen communities, or from the everyday dynamics of Cape Town or Aachen neighbourhoods.

Economic portfolio

The economic portfolio features projects that are designed and implemented to stimulate economic activity and generate economic growth. Projects in this section are aimed at creating sustainable employment opportunities, alleviating poverty and ensuring optimal use of existing resources in a responsible and balanced manner.

Ecological portfolio

These projects are directly linked to the capacity of the biosphere to meet the needs of current and future generations. They demonstrate how natural resources are responsibly used and enhanced in the short term to ensure their continued availability in the long term. Projects in the ecological portfolio are primarily focused on empowering people and organisations to undertake their activities and obligations in an ecologically sustainable manner.



Projects at a glance

This joint Cape Town–Aachen Mayor’s Portfolio of Urban Sustainability showcases 22 projects that are either collaborations between the cities of Aachen and Cape Town or projects of mutual interest, synergy or similarity between the two cities. All projects are closely aligned with, and seek to further, one or more of the SDGs and the 2030 Agenda for Sustainable Development, in the spirit of the Aachen–Cape Town LA21 Partnership. Notably, this publication showcases projects led by local government, as well as those led by stakeholders in participating civil-society, cultural, business and education institutions, but with local government support.

Portfolio projects

For each project featured, the joint Cape Town–Aachen Mayor’s Portfolio contains a description of the project’s objective, design and implementation, as well as lessons to be drawn from the project on embedding and mainstreaming sustainability. Each project is assigned to one of the portfolio sections listed above – vision, social, economic or ecological – depending on its strongest

element. However, most of the projects relate to more than one sustainability dimension. In fact, the portfolio intends to show how projects that would otherwise be limited to addressing social, economic or ecological problems in isolation can be planned, designed and developed to positively influence a range of elements of sustainability.

Vision portfolio		
Project	Description	Evaluation summary
1. Hlumani community centre	Co-created space that addresses challenges associated with accessing local food markets and bridging the gap in social services provision	Demonstrates a people-centric planning approach, which empowers the local community by offering them the opportunity to influence project decision making and outcomes
2. School exchanges	Two-way intercultural exchange programme that inspires the youth and their teachers to be agents of social change	Promotes cultural diversity and raises awareness of the north-south implications of the SDGs by affording participants the opportunity to share experiences in the techniques and principles of sustainable development
3. Energy transition of Aachen’s utility company STAWAG	Strategy towards climate neutrality, comprising individual and interconnected goals and strategies for electricity, heat and mobility	Demonstrates the value of a strong vision and collaborative effort in the shift from a municipal utility company to a smart energy services provider

Social portfolio

Project	Description	Evaluation summary
4. City of Cape Town's Swap Shop project	Waste minimisation solution tailored to support recycling in low-income communities	Represents a cost-efficient approach to waste management that facilitates recycling and waste diversion from landfills
5. Dunoon library	Adaptable three-storey library designed to optimise usable land, while delivering a fully equipped smart facility for both adults and children	Demonstrates effective use of smart, people-centred universal design to restore dignity and promote learning, development and overall well-being
6. Good Hope Lab	International university collaboration empowering students to develop systems thinking, envision alternative futures, and critically evaluate sustainability principles	Encourages students to apply their critical and creative thinking skills to tackle issues of governance, inclusion and spatial applications for sustainability
7. Nelson Mandela statue	Joint intervention to honour former president Nelson Mandela's legacy through the display and narration of events and experiences leading up to South Africa's liberation	Unlocks economic opportunities relating to cultural and heritage tourism in the greater precinct by leveraging Cape Town's unique heritage
8. Open Streets Cape Town	Citizen-driven initiative committed to bringing people together to experience streets as places of connection and belonging	Stimulates behaviour change by creating a platform to demonstrate sustainable mobility, express creativity and local cultures and values, and promote social connection, activism, economic opportunities and healthy recreation
9. Oranjezicht City Farm outreach	Collaborative, site-specific initiatives to make urban social farming projects more robust and effective, for the benefit of communities	Addresses major social challenges by extending the benefits of urban social farming to communities across Cape Town

Economic portfolio

Project	Description	Evaluation summary
10. Cape Town-Aachen robotics symposium	Hosting of the first Cape Town-Aachen robotics symposium, which facilitated collaboration on a wide range of robotics topics and applications	Created significant value for all participants and facilitated collaboration, knowledge exchange and joint project development in the Cape Town and Aachen robotics communities
11. Philippi catalytic precinct project	Precinct approach to unlocking economic opportunities and strengthening community partnerships so as to address deficiencies in hard infrastructure	Supports development of key catalytic sectors in Philippi to stimulate significant job creation and drive social development, education and safety
12. Western Cape Economic Development Partnership	An independent non-profit organisation (NPO), that designs sustainable partnership initiatives to support integration and alignment of economic, social, environmental and spatial governance approaches	Promotes an integrated system of partnerships to facilitate and support public-sector programmes
13. Low-income organic-waste diversion trial in Langa and Wolwerivier	Waste minimisation intervention aimed at organic-waste diversion in low-income areas	Facilitates community participation in implementing waste management solutions by promoting local waste beneficiation opportunities and facilitating skills development

Ecological portfolio

Project	Description	Evaluation summary
14. Aachen city administration's new policy for business trips	Policy measure to stimulate sustainable mobility behaviour by promoting intermodality and multimodality for all employees	Enhances resource efficiency, especially by improving air quality and reducing emissions, through the facilitation of sustainable and environmentally friendly mobility
15. Aachen Euregiozoo supports African penguins	Support campaign established to raise funds for the management and protection of Cape Town's African penguin	Promotes effective public and civil-society partnerships, monitoring and accountability to conserve biodiversity and ecosystems
16. Home composting programme	Integrated programme designed to encourage the diversion of organic waste at household level	Promotes environmental sustainability benefits, including a significant reduction in carbon emissions and the facilitation of waste minimisation
17. Ozone treatment of wastewater at the Aachen-Soers wastewater treatment plant	Extensive research project to investigate the effect of ozone treatment on micropollutants in wastewater	Demonstrates the use of technological interventions to protect ecologically sensitive watercourses from chemical and microbiological contamination emanating from a large sewage treatment plant
18. everwave	A non-profit organisation that develops solutions to prevent marine plastic pollution from entering our oceans, including the development of a platform that extracts plastic waste from rivers	A holistic approach to address the problem of marine plastic waste and support healthy oceans
19. Premium Ways into Aachen's greenery	Network of high-quality walkways connecting small district squares and green oases along short routes	Enhances pedestrians' experience and the accessibility of green open spaces
20. Source to Sea river corridor project	Pilot project aimed at maximising the potential of existing natural assets by integrating social and ecological interventions	Enhances ecological and social resilience through river ecosystem restoration
21. The Aachen Climate Ticket	Initiative to offset carbon dioxide (CO ₂) emissions from air travel by (co-)financing climate protection projects	Promotes resource efficiency and partnerships with community-based organisations (CBOs) to improve food security through offsetting aviation emissions
22. Waste education at the Aachen Stadtbetrieb	Playful and barrier-free approach to teaching children environmental awareness and sustainable behaviour	Promotes waste education as a decisive factor in committing to the environment and climate protection



Vision portfolio

The vision portfolio recognises projects that have achieved substantial outcomes through innovative and visionary planning. It also includes participatory initiatives and outreach programmes aimed at promoting sustainability through behaviour change and the application of design-led processes that stimulate a paradigm shift in urban sustainability and service delivery.

All the projects in the vision portfolio are characterised by:

- exemplary foresight;
- inclusive and thorough planning and design; and
- a commitment to sustainability principles.

While these projects may lead to future “on-the-ground” developments, they currently lack tangible outputs.



Project 1: Hlumani community centre

Problem statement

In developing countries, community gardens contribute to food security for families and communities, which helps improve conditions in impoverished neighbourhoods. In light of South Africa's apartheid legacy, community gardens exist in a complex socioeconomic context that intertwines urban agriculture with urban development, and affects citizens' quality of life. To succeed, urban agriculture needs to extend beyond food production to meet social needs, create social relationships and cultivate collaboration.

Project outline

The Hlumani community centre is a space co-created for and by local farmers in Khayelitsha (Cape Town, South Africa) with the strategic intent of tackling the challenges associated with accessing local food markets and bridging the gaps in social services provision in innovative ways. Through participatory planning, the Hlumani community centre has been designed to be people centric, recognising and considering users' needs.

The centre is intended to be a meeting place for the community, while also serving as a packing station and selling space for farmers. This holistic approach to urban agriculture aims to strengthen connections between local vendors and farmers, and at the same time allow for social development, employment and training opportunities.

Project design

The Hlumani community centre will be situated alongside the Moya we Khaya community garden in Khayelitsha, a vital source of nutritious food for residents in the immediate vicinity.

To design a facility that will meet the needs of local farmers, it was important to understand how existing

gardens in Khayelitsha are structured, and how farmers accessed the market. Through extensive community engagement, local farmers and residents provided a realistic evaluation of the kind of facility that will best meet their needs and enhance their quality of life. Participants included children, teenagers, adults, seniors, and representatives from national and local government. To guide conversation, participants were engaged on eight topics, namely community, education, children/youth, garden/environment, hospitality/recreation, trade, health, and management. Shared community needs that emanated from these conversations were:

- storage and packing rooms for local farmers to minimise waste, increase longevity of produce, and prepare food for sale;
- vendor space to create employment opportunities and strengthen the local economy; and
- a multipurpose room for community workshops, training or cultural purposes.

Hlumani will have a large roof, which will provide shade, and simultaneously serve as a platform for solar panel installation and the collection of rainwater for reprocessing. At the centre of the design is a 130 m² hall, which will be used for packaging the harvested vegetables, and for communal celebrations. A cold store for vegetables, a storage room, and a kitchen which will be used once a week as a soup kitchen for the needy will adjoin the hall. Alongside the buildings, there will be a culture square, where cultural rituals and performances can take place. The design also caters for practice garden beds where workshops can be facilitated, and space to accommodate weekly markets.

Project implementation

The idea behind the community centre first emerged in 2007 and has evolved over the years. During the 2018 Good Hope Lab, Jennifer Krichel, a German architecture

student and former participant in the school exchanges programme (p. 29), took on the challenge of facilitating follow-up community participation workshops, and co-designing the community centre with local stakeholders. Through her coordination, local farmers and residents of Khayelitsha were able to determine their shared needs and objectives, and identify resource requirements to grow local farming, employment and connectivity.

In the first phase, the marketplace and caretaker apartment will be built. The second phase will involve construction of the ablution facilities, and the office building from which Hlumani will be managed and vegetable sales will be coordinated. A guesthouse will be added during the third and final phase to serve as accommodation for visiting volunteers helping in the garden or with affiliated projects in the area. For additional space, containers could be placed under the roof, from where residents can run their businesses, and where a small café can be set up.

To promote resource efficiency, the complex will be constructed from environmentally friendly and recycled materials, such as sandbags, old car tyres, plastic bottles or recycled Tetra Pak®. The complex will also use solar energy and collect rainwater to ensure sustainability and reduce dependence on scarce resources.

A key feature of the design is that individual construction components are easy enough for community members to carry out themselves. In addition, the design allows for the centre to be built in three phases in response to resource availability.

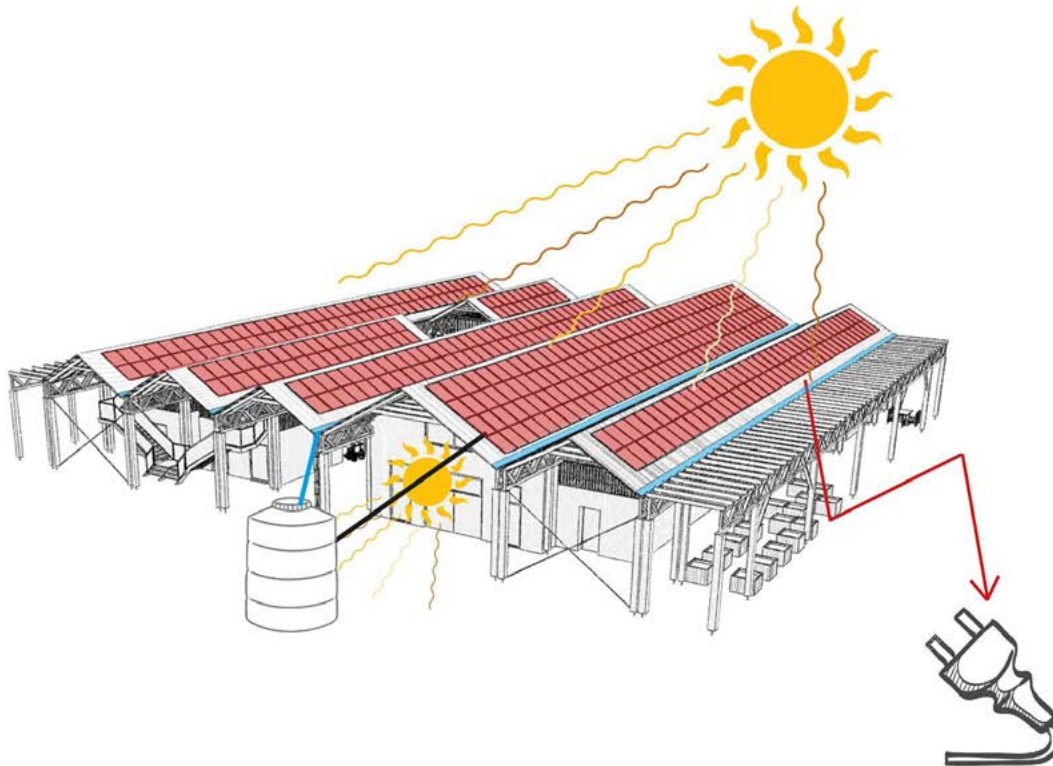
To aid fundraising, a network of representatives from various non-governmental organisations (NGOs), the City of Cape Town and the Western Cape Provincial Government is being established. Although the project is still in its early stages, a crowdfunding campaign was hosted in April 2020 to finance the planning process. The project team also hosted a successful kick-starter market day in January 2020 to test the local level of interest.

Sustainability lessons

SDG 11: Sustainable cities and communities: Target 11.3 (p.102)

This project demonstrates the importance of engaging prospective users in the design process, as they ultimately know their needs best. The participatory workshops were supplemented with insights gained from getting to know the community at grassroots level. Furthermore, community members were kept informed of the design process via a WhatsApp group to ensure transparency and accessibility. This close contact enabled the project team to consider the community's opinions throughout the planning process.

At a community level, the project contributes to the SDG 11 target to “enhance inclusive and sustainable urbanisation and capacities for participatory, integrated and sustainable human settlement planning and management”. The participatory approach adopted for Hlumani enhances trust between decision makers and communities, allows the local community to influence project decision making and outcomes, and enables different groups, including the marginalised and vulnerable, to voice their needs and desires. As knowledge is shared, built and challenged throughout the planning process, consensus with the community can be reached, which ensures wide support and shared responsibility for decisions and the sustainability of project outcomes.





Project 2: School exchanges

Problem statement

Learners and their teachers are a powerful force in creating positive change in local communities and achieving the SDGs. Exposing learners to the SDGs helps them develop insight into issues such as the lack of access to clean water, gender inequality and poverty. Since these issues cannot be separated from culture, learners also need to be sensitised to the interconnected and multicultural world around them. Moreover, equipping learners from a young age to be global citizens who are passionate about caring for others and the planet is essential for them in becoming engaged adults.

Project outline

The school exchanges programme inspires the youth and their teachers to be agents of social change through intercultural exchange opportunities. The two-way north-south exchanges provide learners with high-impact exposure to the conditions in the host country and at their partner school.

The programme affords participants the opportunity to discover the world around them, encourages them to be more tolerant of different cultures and lifestyles, and ultimately helps build a more peaceful society. During their intercultural exchange, participants also gain insight in their own aspirations for the future.

Project design

The school exchanges programme works on the assumption that learners and teachers will be more likely to take action to help achieve the SDGs once they have an understanding of the goals and the associated challenges and opportunities.

Through high school exchanges, participants learn to open their minds to the world and discover the value

of tolerance. To facilitate this, Cape Town participants host visiting students from Aachen and vice versa. To expand perspectives and support relationship building, participants engage in a joint project during the exchange, which also serves to illustrate that there are multiple ways to address local sustainability challenges.

Exchange students are normally accompanied by several teachers. While educators do not have to be experts on the SDGs to participate, the programme does encourage them to explore issues such as clean energy and responsible consumption along with their learners. Cultural exchanges also expose educators to ways of working in other education institutions, which they can then share with learners and fellow educators at their respective schools back home.

Project implementation

For more than 10 years, a successful school partnership between Phoenix High School in Manenberg (Cape Town, South Africa) and Kreisgymnasium Heinsberg (Heinsberg, Germany) has existed. While not a partnership project between the cities of Aachen and Cape Town per se, the project offers numerous lessons for future school exchanges. Through this school partnership, seven exchanges have taken place. Four groups of learners from Heinsberg visited Manenberg, which provided the platform for joint projects such as “Help the Edith Stephens Wetland” (2009), “Garden of the Phoenix” (2010), “Colourful Container” (2012) and “Building Benches and Tables” (2014). In 2011, the first group of seven learners from Manenberg visited Germany and created a partnership mural. Another two visits followed in 2013 and 2015 respectively.

Luhlaza High School in Khayelitsha (Cape Town, South Africa), in turn, participated in a school exchange with Inda-Gymnasium (Aachen, Germany) from 2003 to 2006, and is keen to initiate another exchange. To this end, the project team coordinated two short visits by German

educators from Heinrich-Heine Gesamtschule (Aachen, Germany) to Luhlaza in October 2019. Both schools are willing to formalise an exchange programme. Although still in the planning phase, an initial meeting between school representatives has been facilitated to establish support for the exchange and agree on an exchange direction (south-north). Planning will resume once the current Covid-19 restrictions have been eased.

Primary schools are also included in the initiative. While personal exchange is not possible due to the learners’ young age, various other methods are used to teach the learners about the SDGs and expose them to different cultures. In 2017, for example, Grade 3 learners from Grundschule Richterich (Aachen, Germany) packed a trolley with typical items that reflected their German culture, everyday life in Aachen, and their commitment to protecting the environment. The trolley was sent to Grade 3 learners at Fairview Primary School in Grassy Park (Cape Town, South Africa). In return, the learners at Fairview packed a trolley for their German counterparts, focusing on the water restrictions associated with the severe drought in Cape Town at the time. This helped the German learners grasp the consequences of climate change in a vivid manner. The partnership between the two schools continued through a video project in 2018. An educator exchange is planned for the near future to build support for the programme and promote ongoing collaboration.

Sustainability lessons

SDG 4: Quality education: Target 4.7 (p.101)

Education for sustainable development helps learners build the knowledge, skills, understanding, values and actions needed to realise a sustainable future that promotes environmental protection and conservation, social equity and economic growth.

The school exchanges programme aligns with SDG 4, “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all”, by

promoting exposure to diverse cultures.

Exchange experiences also raise awareness of the north-south implications of the SDGs, and afford participants the opportunity to share their experiences of the techniques and principles of sustainable development.

The programme has had a life-changing impact on learners, with various knock-on effects. For example, since her participation in the programme, German student Jennifer Krichel has visited Cape Town multiple times and contributed to projects such as the Good Hope Lab (p. 41)

and Hlumani community centre (p. 26).

This demonstrates how the programme inspires participants to forge relationships with peers in the host country, gain an appreciation for the foreign culture and expand their mindsets. Exchange students also bring a wealth of knowledge to the classroom in the form of diversity and new perspectives. As such, the school exchanges programme effectively supports educators and learners' active participation in their local and global communities by developing awareness of cultural norms and differences.





Project 3: Energy transition of Aachen's utility company STAWAG

Problem statement

For decades, the Aachen region, which forms part of the Rhenish mining district, has been characterised by the extraction, mining and refining of lignite and coal-fired power generation. In January 2019, the German Commission on Growth, Structural Change and Employment resolved to phase out coal-fired power generation by 2038. Long before this decision, however, Aachen's utility company, Stadtwerke Aachen AG (STAWAG), had developed integrated strategies to achieve its long-term goal of "climate neutrality" for its different sectors (electricity, heat and mobility).

Project design

STAWAG is the energy supplier for Aachen. The utility supplies electricity, natural gas, district heating and drinking water to over 150 000 households and numerous businesses and companies. STAWAG forms part of E.V.A. Energieversorgungs- und Verkehrsgesellschaft mbH Aachen, which is owned by the City of Aachen.

For many years, STAWAG has been pursuing the overall goal of operating sustainably and promoting climate protection. The company has positioned itself as a pioneer in many areas. After the first solar façade was installed on one of its own buildings back in 1991, cost-covering remuneration for solar power was introduced in Aachen in 1995. For over 25 years, STAWAG has been offering energy advice and initiating subsidy programmes to achieve energy savings. In 2006, it was the first company in Germany to feed biogas into the natural gas network. To decisively move towards climate neutrality, individual and interconnected goals and strategies were defined for the utility's electricity, heat and mobility sectors.

Project implementation

Green electricity from wind and solar

A new 2030 target has recently been set to increase STAWAG's generation so as to supply the entire Aachen with climate-neutral, green electricity. To this end, a department has been established with a team of 35 employees, who are exclusively concerned with renewable-energy systems. STAWAG has worked continuously to supply its customers with environmentally friendly electricity and heat.



Wind power plays an important part in this endeavour: STAWAG currently operates 21 wind farms in the Aachen region and in various other areas of Germany. Citizens could purchase shares in the latest wind farm, which was completed in 2020. The offer was well received and the shares were sold out within 10 days.

Twelve solar fields and numerous smaller solar plants also help STAWAG offer competitive green electricity products. With a current capacity of 500 million kilowatt-hours, STAWAG already generates sufficient green electricity to supply to all private households and smaller commercial customers in Aachen. Moreover, on the journey to climate neutrality, STAWAG is helping its customers generate their own green electricity. For example, it has developed the "solar roof for rent" for private customers. Electricity generated can be used or stored for household purposes, such as to power electric cars or bicycles. The utility further promotes the use of decentralised combined heat-and-power plants.

Heat - alternatives to coal

STAWAG is taking steps to ensure that heat supply for Aachen becomes more sustainable and climate friendly. While heat is currently still largely extracted from a lignite-fired power plant in Weisweiler, close to Aachen, the utility intends to supply Aachen with 100% coal-free heat by 2029 at the latest. An important step towards this goal is the use of modern, efficient, gas-fired combined plants for heat and power generation. In 2019, a new 10 megawatt (MW) block-type thermal power station was commissioned in Aachen, while construction of a 20 MW plant, also in the city area, was on track to start at the end of 2020. Deep geothermal energy and heat extraction from waste incineration will play a key part in heat supply in the future.

In addition, as with the electricity sector, STAWAG plans to expand decentralised generation and use for the heating sector. The utility is therefore developing and promoting climate-friendly local heating concepts based on combined heat-and-power generation, heat pumps, low-temperature technologies, and seasonal heat storage using solar thermal systems or waste heat recovery.



Sustainable mobility - clean electric vehicles



Clean mobility is an important factor in pursuing a sustainable city. To this end, STAWAG began promoting and advancing electric mobility more than 10 years ago. In 2010, STAWAG and partners founded the innovation company smartlab, which rapidly became a leader in developing electro-mobility products and services. One of smartlab's central services is ladenetz.de - a network of municipal energy suppliers and business partners working for the nationwide supply of electric charging points. These points are easily accessible with a card or app for barrier-free charging of electric vehicles. A further 106 000 charging points are accessible throughout Europe via the platform e-clearing.net.

In Aachen, STAWAG is establishing efficient charging infrastructure for electric vehicles with over 140 charging points already set up, all operated with green electricity. STAWAG aims to set up another 1 000 charging points for semi-public, private and commercial use within the Aachen area by 2025. The project is already being implemented. In addition, in 2018, an e-Store was launched in the city centre, which serves as a one-stop shop for all questions concerning electric mobility. The e-Store provides citizens with information on vehicle types, advice on charging options and possible subsidies, and an opportunity to test-drive cars, pedelecs ("pedal electric cycle") and load bikes.

Sustainability lessons

SDG 7: Affordable and clean energy: Target 7.2 (p.101)

STAWAG's energy transition aligns with the SDG 7 target to "increase substantially the share of renewable energy in the global energy mix project" by 2030.

Together with various partners, STAWAG has offered extensive consulting and support programmes aimed at deploying innovative solutions and achieving energy savings. The conversion to modern and efficient heating systems, for instance, is supported within the framework of attractive contracting models. STAWAG also provides targeted advice to investors to support sustainable neighbourhood development, which facilitates the integration of sustainable renewable-energy supply with new developments.

In general, facilitating an energy transition towards climate neutrality requires a strong vision, widespread partnerships, customers who support the vision, and the political will to implement the required changes. In this regard, STAWAG has partnered with many stakeholders to jointly move from a more conventional municipal utility company to a smart energy services provider that serves the city and its citizens through a combination of innovation and a decentralised, renewable and digital energy system.



Social portfolio

The projects in this section have a strong social component. Most have involved extensive community consultation in developing processes and structures. While promoting sustainability as an overall outcome, the projects in this category were originally motivated by the need to address a social problem that had arisen in Cape Town or Aachen communities, or from the everyday dynamics of Cape Town or Aachen neighbourhoods.



Project 4: City of Cape Town's Swop Shop project

Problem statement

Cape Town's landfills are running out of space. Part of the City of Cape Town's approach to diverting waste from landfills is to separate waste for recycling. For well over 10 years, the City has provided kerbside recycling collection services to an increasing number of households. Currently, over 20% of residents benefit from this programme. In addition, the City invites residents to dispose of their sorted recyclables at more than 20 municipal drop-off sites across town for contractors to recycle, and has made a waste recyclers map available on its website to indicate the location and contact details of private drop-off sites and recycling collectors operating in Cape Town. By funding GreenCape, the City also facilitates recycling and waste minimisation by commerce and industry. Unfortunately, these initiatives are generally not yet widely accessible to Cape Town's most vulnerable communities.

As a result, the main aim of the Swop Shop project is to identify and trial an appropriate waste minimisation solution for low-income areas, realising that a "cookie-cutter" approach cannot be applied to all communities, as different communities have different views on recycling. For example, most upper or middle-income communities are happy for the City to collect their recyclables without expecting any remuneration in return, drawing sufficient satisfaction from having contributed to environmental protection and sustainability. Lower-income communities, however, generally expect some form of benefit in exchange for their recyclable waste, being aware of the intrinsic monetary value of recyclables.

Project outline

In 2018, the City's Waste Minimisation Unit in the Solid Waste Management Department surveyed residents in four low-income areas to understand their approach

to recycling. The survey also aimed to establish whether there would be support for a project or programme where residents could exchange their recyclable waste for tokens to buy items from a Swop Shop. Once community interest was confirmed, a mobile Swop Shop trailer was designed and built, and an independent contractor from the small, medium and micro-sized enterprise (SMME) sector was appointed to conduct a six-month trial.

The trial was conducted on four City-owned properties situated in close proximity to the four identified communities. The aim was to test the feasibility of the Swop Shop approach in these areas and gauge actual community participation, with the goal of diverting as much as two tonnes of recyclable waste per operating day. Each operating day covered one community, and either a weekly or fortnightly service was delivered per identified project area.

Project design

The Swop Shop approach as a waste minimisation methodology has been used by many municipalities. However, the shops are often stationary and open only once a week. This inefficiency stems from high development and overhead costs, and limits the service to areas where a permanent facility can be built or obtained.

The City of Cape Town's Waste Minimisation Unit believed that a mobile service would enable more communities and individuals to benefit from the waste minimisation effort, as the trailer could efficiently serve different communities each week. Once the mobile Swop Shop proposal received management support in 2019, Solid Waste Management's Technical Services Branch procured a trailer-mounted Swop Shop, constructed and fitted out to specifications designed by the Waste Minimisation and Technical Services teams, complete with eye-catching branding and public messaging.

A six-month trial period was originally agreed on to test the approach in the four low-income communities of Bloekombos, Delft, Ysterplaat and Khayelitsha. Covid-19 related restrictions shortened this trial to five months.

Project implementation

The service provider would stock the Swop Shop with items such as non-perishable food, toys, books and clothing, which were then exchanged for recyclables handed in by residents. Recyclable items included cooldrink bottles, cans, detergent bottles and plastic items such as broken chairs. The service provider would check and receive the recyclables, weigh them, and issue a voucher for their value, which is then exchanged for any of the stock items in the Swop Shop trailer.

Using a separate trailer, the service provider would then remove the collected recyclables off-site and sell them to a recycling processing plant, thereby bringing the materials back into the manufacturing industry.

Prior to the initiation of the Swop Shop trial in February 2020, relationships were built with, and support was established from, the relevant subcouncils in the four areas, who partnered with local communities and nearby schools that could serve as additional project locations in the relevant areas.

In the first two weeks of operation in February 2020, over three tonnes of recyclable items were exchanged. Another six tonnes were exchanged in March 2020 before South Africa went into its nationwide Covid-19 lockdown. The trial restarted in October 2020, diverting 28 tons that month. Due to interest from new communities, Gugulethu and Wesbank were added. 29 tonnes and 31 tonnes were diverted in November - up to approximately 20 tonnes per month. In total the project diverted 98.7 tonnes over the five month project, a significant step towards a successful recycling programme in low-income areas.

In the last weeks of operation before the lockdown, between 50 and 100 people brought their recyclables to the Swop Shop every day, mostly handing in steel cans, PET beverage bottles and rigid plastic items. This number progressively increased from October to December 2020, when the project resumed. Every recyclable item, no matter how small, adds up and makes a difference to the sustainability of the project, and improves the City's resource efficiency.

Sustainability lessons

SDG 12: Responsible consumption and production: Target 12.5 (p.102)

The Swop Shop project supports multiple sustainability objectives. It builds a sense of community by facilitating residents' participation in implementing solutions. It alleviates poverty by providing residents with items to meet their basic needs, such as food, books and clothing. It enhances resource efficiency and reduces waste by facilitating recycling and diverting waste from landfill. Finally, it is an efficient and cost-effective approach to waste management.

The project specifically contributes to the SDG 12 target to "substantially reduce waste generation through prevention, reduction, recycling and reuse".

Although the trial was shortened due to Covid-19 restrictions, indications are positive for its long-term sustainability. Despite the costs per ton for the five month trial being relatively high, it was calculated that the progressive increase in monthly participation and resulting tonnages would offset some of these costs, bringing operational costs of such a service to a sustainable level.

Indications are that residents are keenly interested in supporting the initiative, diverting waste they may have otherwise thrown in their refuse bin from landfill in exchange for useful Swop Shop stock items. This will, at the same time, enhance resource efficiency and improve these communities' well-being.

It has also been noted that residents are increasingly appreciative of the potential value of recyclable waste in the environment. This is clear from their willingness to pick up recyclable litter so as to gain access to the benefits of the Swop Shop. The results are a cleaner environment, increased community well-being, and improved resource efficiency, all of which bode well for the sustainability of the Swop Shop concept.





Project 5: Dunoon library

Problem statement

Libraries play an important part in connecting communities in a mutually beneficial manner. They pool resources and bring communities together to learn, share and celebrate where they live, who they are, and what they want to become. Although the City of Cape Town has 102 libraries, delivering library services in densely populated areas such as Dunoon (Cape Town, South Africa) is a challenge.

Initially established as a post-apartheid township (less formal settlement) for 14 000 people in 1995, Dunoon has grown organically and is now home to over 80 000 residents. However, the provision of community facilities and amenities, including libraries, in the area has lagged behind the rapid rise in informality and high living densities. In 2013, a local area plan was drawn up for Dunoon, which identified 12 key projects in the area. After consultation with stakeholders, including extensive consultation with the residents of Dunoon, the City of Cape Town identified a learning and innovation precinct as a critical starting point for regeneration.

Project outline

Following on the development of a sports complex, the Dunoon library was the second phase of a community learning and innovation precinct. This versatile, multipurpose area with its multistorey buildings offers residents a location for an integrated education and skills development experience that fosters an inspiring and innovative learning culture. The library gives community members from a vulnerable part of Cape Town access to a world-class source of recreation and education.

In light of the limited space available in Dunoon, the library was designed as an adaptable three-storey, steel-framed concrete and glass building to optimise usable land, while delivering a fully equipped smart facility. It offers a broad range of services, including e-learning, skills development and training programmes, and an employment information space that links residents with possible employers. It is a bright, safe and welcoming space for both adults and children.

Project design

In addition to making efficient use of land, the library is designed for disassembly, rendering the entire building flexible and convertible. This adaptive design will make the building easy to modify or alter to accommodate plans in future phases of the programme. Similarly, the roof over the central circulation void can be removed to allow for expansion onto the third floor, without adversely affecting library operations.

To help reconnect people to the natural environment, the building also incorporates biophilic design. This is an innovative way of incorporating natural materials, natural light, vegetation and views of nature into the built environment.

Project implementation

The Dunoon library is the result of a five-year joint venture that brought together local, provincial and national spheres of government to deliver a high-quality learning resource.

The library has a collection of more than 15 000 items such as books, CDs and DVDs. Library users have free internet access through the City's Smart Cape service, and free Wi-Fi with limited downloads. In addition, the library offers reading programmes and storytelling sessions for younger residents.

To further encourage social inclusion and a sense of belonging, the Dunoon library is designed to accommodate community meetings and private study sessions. It also has social spaces, such as circles of couches and outdoor spaces, which are popular with mothers while watching their children play.

In July 2019, the Dunoon library won the Seoul Human City Design award. The letters of recommendation on the City's behalf included an endorsement from the Aachen-Cape Town LA21 Partnership, and a team from Aachen visited the precinct twice during its development. The award money will help kick-starting the Potsdam Sustainability Campus through its first chapter: agriculture.

Sustainability lessons

SDG 4: Quality education: Target 4.1 (p.101)

SDG 12: Responsible consumption and production: Target 12.2 (p.102)

The Dunoon library builds a sense of community by providing a safe and central space for connections, as well as resources that enrich lives, inspire learning and foster creativity. Furthermore, building this state-of-the-art facility in a previously disadvantaged part of Cape Town ensures that knowledge and technology is available to everyone, and not just to those who can afford it. This helps raise the education and literacy levels of society as a whole, and addresses major social challenges. The flexibility of the building ensures that it can meet both present and future community needs. Therefore, this project supports the SDG 4 target to "build and upgrade education facilities that are child, disability and gender-sensitive and provide safe, non-violent, inclusive and effective learning environments for all".

Moreover, various aspects of the library's design attest to a conscious effort to minimise resource use and waste. The building is energy and water efficient, making use of LED motion-sensor lights and greywater. An innovative double-skin curtain-wall system keeps the building cool in summer by reducing heat gain in the internal spaces, while letting in maximum daylight. Good airflow also ensures indoor comfort. This efficient use of resources aligns with the SDG 12 target to "achieve the sustainable management and efficient use of natural resources" by 2030.

The Dunoon library effectively uses design to restore dignity and promote learning, development and overall well-being. It is an excellent example of smart, people-centred universal design, characterised by intensive community consultation and collaboration.



Project 6: Good Hope Lab

Problem statement

Modern cities grapple with challenges that affect communities and pose a threat to the global commitment to a more sustainable future. The complex nature of these challenges calls for leadership and collective action, supported by interdisciplinary tools and skills. Against this backdrop, tertiary institutions have a unique part to play in moving society towards a sustainable future by inspiring awareness and cultivating a sense of responsibility in upcoming professionals and experts. Ultimately, what and how students are taught, and what they are not taught, contributes to how nations will prepare and respond to urban sustainability challenges.

Project outline

The international university collaboration project fosters a north-south dialogue between students by stimulating a global agenda discussion and framing urban sustainability topics in a local context. Taking the form of a study tour and student workshop called the Good Hope Lab, this project incorporates sustainability lessons into strategies and design proposals to reimagine urban areas based on site visits, expert inputs and knowledge exchanged with peers, stakeholders and professionals.

Experiential learning empowers students to develop systems thinking, challenges them to envision alternative futures, and critically evaluate sustainability values and principles. A key project outcome is participants' ability to collaborate and benefit from mutual motivation and personal experience.

Project design

The university collaboration is targeted at postgraduate students from disciplines such as urbanism and architecture. By engaging participants in an intense peer-to-peer learning experience characterised by an open,

stimulating and creative atmosphere, the project cultivates awareness and inspires innovation for sustainable local action.

The 2018 Good Hope Lab brought together 30 participants from the Department of International Urbanism at the University of Stuttgart, the School of Architecture, Planning and Geomatics at the University of Cape Town, and the Institute of Landscape Architecture at the RWTH Aachen University. Over 10 days, participants explored the potential of urban farming as a catalyst for sustainable development and social cohesion in Cape Town.

Project implementation

The longstanding partnership between the cities of Aachen and Cape Town provided the critical foundation and support needed for dialogue and collective action between the participating universities, citizens, NGOs and local government in pursuit of the SDGs.

Following the success of the Oranjezicht City Farm, a well-developed urban farming project in Cape Town, the SAUFF Trust sought to develop a Good Hope City Farm at the Good Hope Seminary Junior School in Vredehoek (Cape Town, South Africa). Coordinators of the university collaboration recognised this as an excellent opportunity to study the role of urban agriculture for collective action at a school, neighbourhood and city scale.

With a focus on strengthening sustainable livelihoods, the 2018 Good Hope Lab identified the Good Hope Seminary Junior School as a catalyst site. Students were tasked with developing concepts and interventions that could be implemented on the school's two-hectare urban farm. Furthermore, although the school is located in an upper to middle-class district, many of its learners travel from impoverished parts of town. This unique situation encouraged students to consider the social and spatial conditions of the school within its context, and to explore

ideas that could improve quality of life, promote food security and strengthen community cohesion.

Emerging from this microscale study, participants proposed strategies to make the site more accessible, while empowering people and promoting community integration. These proposals will be translated into design solutions over time. In addition, through their learning experience, students initiated hybrid projects, such as the development of a raised high-bed prototype at the school, and, as a follow-up project, facilitated community workshops relating to the Hlumani community centre (p. 26) for the Moya we Khaya community garden in Khayelitsha.

To continue the university collaboration, partners have developed a memorandum of understanding between Aachen University and the University of Cape Town for ongoing academic cooperation, as well as to pursue possible research projects in the field of urban farming in the South African context.

Sustainability lessons

SDG 4: Quality education: Target 4.7 (p.101)

SDG 11: Sustainable cities and communities: Target 11.7 (p.102)

The university collaboration project was founded on the SDGs, particularly goal 11, "Make cities and human settlements inclusive, safe, resilient, and sustainable". As such, it set out to tackle issues of governance, inclusion and spatial applications for sustainability. The lessons learnt from the project will be useful as a future reference for students, researchers and practitioners working in the field of sustainable development.

Although the 2018 Good Hope Lab ran for a limited time, it exposed students to crucial realities on the ground, including challenges and opportunities. Project coordinators incorporated a combination of

teaching approaches to promote reciprocal learning and communication between students and educators. Moreover, working in intercultural and interdisciplinary groups, students developed a value system emphasising responsibility to oneself, others and the planet.

By focusing on a defined study site, students were able to apply their critical and creative thinking skills to design solutions. One of the key lessons learnt through the experience was that even when faced with a range of extreme challenges in an urban area such as Cape

Town, the solutions may lie in small-scale interventions to mobilise communities and activate spaces at a local level.

In the case of the 2018 Good Hope Lab, urban farming proved a useful tool to empower people and bring them together by breaking down the physical and mental barriers that had separated them. The experience helped learners acquire the knowledge and skills needed to promote sustainable development, which is in line with SDG 4.





Project 7: Nelson Mandela statue

Problem statement

The Western Cape Provincial Government's Department of Economic Development and Tourism (DEDAT) is guided by provincial strategic goal 1, "Creating opportunities for growth and jobs". In pursuit of this goal, Project Khulisa was initiated to identify sectors of the Western Cape economy with the greatest potential for accelerated and sustained growth and job creation, as well as the key challenges facing these sectors. One of the sectors identified was tourism. The main difficulties in the Western Cape tourism sector highlighted by Project Khulisa were:

- awareness - no clear brand; uncoordinated and, sometimes, competing marketing efforts; overlap in destination marketing spend by multiple public sectors; negative perception associated with Africa;
- accessibility - onerous visa restrictions; long-haul destination; limited direct flights; and
- attractiveness - fragmented provincial tourism strategy; undeveloped tourism product offering; difficult for tourists to move around within the destination; negative perceptions around safety of the destination.

Addressing these challenges and setting the Western Cape tourism sector on a new growth trajectory will require significant government and private-sector investment.

Project outline

To commemorate what would have been former president Nelson Mandela's 100th birthday, the City of Cape Town partnered with DEDAT to unveil a near-life-size bronze statue on the balcony of the Cape Town City Hall in July 2018. In addition to the statue, the project included site-specific enhancements to the city hall, such as the development of a Mandela exhibition. The exhibition comprises audiovisual equipment, interactive displays and

interpretive panels to commemorate Mandela's legacy, honour the people and organisations involved in the liberation struggle, and depict the events leading up to Mandela's release and the transition to democracy.

This multistakeholder initiative seeks to transform the city hall into a popular tourist attraction, where visitors can visualise the liberation events and experience South Africa's journey to democracy, with a particular focus on Mandela's experience in Cape Town.

Project design

The statue memorialises former president Mandela's first public speech after being released from prison on 11 February 1990, given from the city hall balcony. The brief to the sculptor was to reflect the weight of history, while still maintaining contemporary relevance. The bronze figure is a recognisable, convincing and historically accurate representation of Mandela addressing a crowd of more than 100 000 people hours after his release, and has been erected in the exact location where he stood while doing so. The statue features the grey suit and printed tie Mandela wore on the day of his release, with his one hand raised in a wave, as famously depicted in photographs from that day. In the other hand, Mandela holds the text of his speech and a pair of glasses.

Although the former statesman was 1,85 m tall, it was proposed that the final statue be 2 m high for increased visibility at a distance or from below. The sculpture, cast in 150–250 mm thick bronze, weighs 120 kg and is hollow.

Project implementation

Due to the numerous stakeholders involved, a task team comprising DEDAT, the City of Cape Town and Heritage Western Cape was established for the project's implementation. Because this was a joint project, and the statue was to be erected at a City of Cape Town asset (city hall), a public participation process was required before design could commence.

The task team made recommendations for the procurement of the statue, and a call for proposals was issued by DEDAT, inviting interested service providers to submit their ideas of what the statue should look like. DEDAT evaluated the proposals received, and shortlisted the service providers based on set criteria. Cape Town-based artists Xhanti Mpakama and Barry Jackson were commissioned as the sculptors of the statue.

The artists worked with extensive archival reference material, including photographs and film footage of the balcony speech, to create a maquette. The maquette was then scaled to full size, refined and remodelled in clay, and again submitted for approval by the client team before moulding and bronze-casting.

The statue is positioned on the city hall balcony, in the designated exhibition space, and is freestanding on a steel base. It has no impact on the fabric of the city hall building and poses no health and safety risk. The installation is supported by all the necessary structural engineering approvals and warranties.

The sculpture was unveiled on 24 July 2018. The opening date for the exhibition inside the city hall is yet to be confirmed.

Sustainability lessons

SDG 4: Quality education: Target 4.7 (p.101)

SDG 8: Decent work and economic growth: Target 8.9 (p.101)

SDG 11: Sustainable cities and communities: Target 11.4 (p.102)

SDG 12: Responsible consumption and production: Target 12.2 (p.102)

The project forms part of Project Khulisa, a Western Cape government project aimed at supporting those economic sectors with the greatest growth and job creation potential. Among others, the project seeks to add up to 100 000 jobs to the tourism sector. The visitor experience at the city

hall serves to unlock economic opportunities relating to cultural and heritage tourism in the greater precinct, such as the Grand Parade, the Castle, the Old Granary, Church Square, the Iziko Slave Lodge, the Company's Garden and St George's Cathedral. By leveraging this unique heritage, the aim is to build an attraction that will draw visitors to the region, thereby enhancing the regional and city economy.

The initiative is aligned with a number of SDGs. Among others, by protecting and safeguarding cultural heritage, it helps make cities inclusive, safe, resilient and sustainable (in line with SDG 11), while also advancing sustainable tourism that promotes local culture (a target of SDG 8).

Moreover, the statue was designed to have minimal interference with the architecture of the city hall, given its status as a heritage building.

Mandela's legacy was also honoured and recognised internationally when the City of Aachen renamed a park after the South African Nobel Peace Prize winner. The name change to "Nelson Mandela Park" stems from an application made by the Aachen-Cape Town LA21 Partnership Committee in 2015.





Project 8: Open Streets Cape Town

Problem statement

Cape Town is deeply divided, with social and spatial segregation persisting many years after colonialism and apartheid have ended, as well as dysfunctional public transport systems and unsafe streets and public spaces. Although bicycles and other forms of active mobility offer ways to get around and connect the city, uptake of these transport modes has been slow. People have few opportunities to connect and socialise in neutral and welcoming public spaces. Open Streets challenges the status quo by actively demonstrating the potential of vibrant, people-friendly streets and public spaces to shift the culture of how we live together in our cities and help transform the urban environment.

Project outline

The non-profit organisation (NPO) Open Streets Cape Town (OSCT) runs the Open Streets days programme and does additional advocacy and campaign work to promote the potential role of streets in sustainable urban development. Since 2013, this citizen-driven initiative has grown into a movement of people – friends, volunteers, partners and communities – who are committed to seeing the Open Streets philosophy of “streets for people” becoming a reality. The programme has also built meaningful connections between local government, community partners, the private sector and the global urban development community, and serves as a connector and catalyst for change.

By temporarily closing a street to motorised traffic, the aim is to bring people together to experience streets as places of connection and belonging, break down social barriers and build a sense of community in neighbourhoods across Cape Town. This helps create a connected, safe and inclusive city.

Project design

The first Open Streets initiative in Africa was inspired by the Ciclovía programme of Bogotá, Colombia, which creates over 100 km of car-free streets every Sunday and on public holidays. For OSCT, a core initial goal was to help create a more cycling-friendly city, although this quickly expanded into generally changing how streets are used, perceived and experienced, creating shared spaces that embody respect, and helping bridge the social and spatial divides of Cape Town.

OSCT built on earlier initiatives of the Western Cape Provincial Government and the City of Cape Town, who initiated car-free festivals in 2003 and 2004, as well as an Open Streets event in 2012, also inspired by Bogotá's Ciclovía. The City of Cape Town has been a key partner in developing the Open Streets programme, providing grant funding and ongoing endorsement.

The following values underpin OSCT's approach:

- **Citizen-driven** - relying on engagement with, and input from, residents and communities
- **Experimental** - learning by testing and doing
- **Socially conscious** - being aware of Cape Town's reality and working to respond accordingly
- **Imaginative** - creatively designing interventions and programmes
- **Resourceful** - finding ways to solve problems and overcome challenges
- **Reliable** - delivering on its promise
- **Respectful** - treating people as human beings first, and role players second
- **Inclusive** - welcoming everyone at Open Streets days and in taking part in city making
- **Adaptive**, - learning from experience and adapting its programmes accordingly

Project implementation

The Open Streets programme has taken root in five parts of Cape Town (Woodstock, Bellville, the central city, Langa and Mitchells Plain), with 21 Open Streets days hosted over six years, attracting up to 15 000 participants each time*.

Open Streets days, organised in collaboration with community partners and local government, actively demonstrate the potential of vibrant, people-friendly streets and public spaces to change behaviour and how we co-exist in our cities. The programme promotes sustainable mobility, creative expression, social connection, local cultures and values, activism, economic opportunities and healthy recreation.

In 2018, OSCT was a winner in the first global Transformative Urban Mobility Initiative (TUMI) challenge. This success enabled it to host an Open Streets learning exchange later that year, which catalysed a growing network of African cities hosting similar activities (including Kampala, Addis Ababa, Kigali and Abuja). The City of Cape Town's partnership with the City of Aachen has unlocked possibilities to share this successful Cape Town sustainability programme with the Aachen team, taking some inspiration from our experience here.

Sustainability lessons

SDG 11: Sustainable cities and communities: Target 11.2 and 11.3 (p.102)

OSCT creates a platform to encourage behaviour change towards a more sustainable urban environment, in support of SDG 11 targets to "provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety" and to "enhance inclusive and sustainable urbanisation".

*<https://youtu.be/wdauv5LbGXQ>

Practical outcomes of Open Streets days in Cape Town have included:

- experiencing the potential of streets and public spaces to be safe, vibrant and inclusive;
- a meaningful coming together of people and communities in positive, inclusive and diverse ways;
- experiencing sustainable mobility modes (walking, cycling, skating) in a safe environment;
- economic opportunities for local businesses along Open Streets routes, as well as mobile traders;
- opportunities for all ages to engage in healthy recreational activities;
- the strengthening of local stakeholder networks, collaborating to host a successful Open Streets day;
- creating platforms for NGOs, sports clubs, civic organisations, etc. to promote their work and connect with their communities; and
- providing platforms for local government departments to involve communities in various programmes.

These outcomes have resulted in:

- the breaking down of social barriers (racism, fear, mistrust, etc.);
- stronger connections between communities;
- an increased sense of community in neighbourhoods;
- an increased sense of belonging in streets and public spaces;
- an increased sense of place, pride and ownership in communities;
- safer streets and public spaces;
- more sustainable mobility behaviour; and
- the expression of creativity, local cultures and values.





Project 9: Oranjezicht City Farm outreach

Problem statement

South Africa is one of the most unequal societies in the world and faces the impact of climate change, the persistent legacy of apartheid, and the typical disconnectedness associated with increasingly digital lives. In general, South Africa's urban communities are socially, ecologically and economically fragile.

The SAUFF Trust is an NPO that works through food and farming to strengthen South Africa's urban communities and the ecosystems that sustain them. The trust was established in 2012, two years after the inception of the Oranjezicht City Farm (OZCF), a 0,25 ha community food garden on a heritage site on the slopes of Table Mountain.

At the time, subsistence farming was practised in underresourced communities in Cape Town, and smallholder commercial farming in the Philippi horticultural area, but not many community food gardens existed. In response, the SAUFF Trust set out to support collaborative urban food gardens, social farms and markets in order to strengthen and build intra- and intercommunity social cohesion, improve household food and nutrition security, and conserve and protect natural urban ecosystems.

Project outline

The direction and mission of the SAUFF Trust was informed by the insights gained from establishing the OZCF. A key approach of the trust is to conceptualise, design and pilot innovative methods and models, and apply the lessons learnt to projects in other parts of Cape Town to ensure that the benefits and impacts of urban social farms can be scaled up and supported in other communities. This was also the rationale behind the SAUFF Trust outreach programmes, which include collaborative initiatives in Vredehoek, Langa and Dunoon.

The two broad aspects of the trust's work are to help establish new urban farms, and to engage and support existing urban farms, in diverse contexts. Therefore, each SAUFF Trust outreach project has different goals and objectives, tailored to the specific needs and site-specific context of communities and partners.

The Good Hope Seminary Junior School, while situated in the affluent Cape Town neighbourhood of Vredehoek, is mainly attended by learners from the Cape Flats. This means that the school community (students, parents and teachers) is geographically removed from the school, and social cohesion and connection between the school and the surrounding Vredehoek community is weak. Establishing a Good Hope City Farm at the school was conceived as a way to directly support learner education, forge a relationship between the school community and Vredehoek residents, and inspire other stakeholders to engage in community food gardening wherever they reside.

In general, the other SAUFF Trust outreach projects that emerged from the experience at the Good Hope City Farm are all underpinned by the same goal, namely to grow communities through growing food.

Project design

Since each community with which the SAUFF Trust engages has unique priorities and needs, the trust's outreach projects all have different methods, features and deliverables. Yet all share the objectives of co-creating context-specific innovations with the community, providing context-specific support that avoids long-term dependency, while addressing specific gaps, which may include meeting technical, information or network needs, connecting projects, seeking funding and other resources, or playing a facilitation role.

The Good Hope City Farm was intended to be a signature farm that covers 7 000 m² of the school's 5,2 ha grounds. A 10-year agreement was entered into with the school

governing body and the Western Cape Department of Education to establish the farm at the school, and a farm design, implementation plan and operating model were developed. Over R5 million was raised for the project.

The Aachen-Cape Town LA21 Partnership, having collaborated with Abalimi Bezekhaya on subsistence and livelihood-driven urban agriculture for more than a decade, started engaging with the SAUFF Trust in 2016 with a specific focus on social urban agriculture. As part of the Good Hope Lab (p. 42) in 2018, 30 students from the Department of International Urbanism at the University of Stuttgart, the School of Architecture, Planning and Geomatics at the University of Cape Town, and the Institute of Landscape Architecture at the RWTH Aachen University explored the potential of urban farming as a catalyst for sustainable development and social cohesion in Cape Town. The study focused on the Good Hope City Farm, and students provided input and ideas to address issues of potential farm function, design and approaches from an urban design and landscape architecture perspective. The insights from this process resulted in interesting spinoffs which were applied in support of other projects.

For instance, site visits during the Good Hope Lab brought members of the SAUFF Trust to Dunoon's learning and innovation precinct, which led to a new urban agriculture collaboration in that community (p. 41). In addition, one of the RWTH students participating in the Good Hope Lab went on to develop designs and plans for the Hlumani community centre in Khayelitsha (p. 26), which will be located at an existing urban farm and will include a hall for packaging harvested vegetables and for communal celebrations.

As with the Good Hope City Farm, the SAUFF Trust's approach is to develop innovations that aspire to scale, with an overall objective to improve the robustness and effectiveness of urban social farming projects in bringing positive benefits to communities.



Project implementation

Plans to establish the Good Hope City Farm have encountered various challenges, including changes in school leadership and governors, the protracted drought in the Western Cape, and technical delays in establishing a viable borehole. Over the four years of planning and preparations, the urban agriculture context in Cape Town has also changed and the priorities have shifted. While, today, it appears unlikely that the farm will be established as originally conceived, the process insights, knowledge, relationships and lessons learnt have been vital for other SAUFF Trust outreach projects, in particular for the design and project plans of two other sites.

The first is a collaboration between the SAUFF Trust and the non-profit community development trust The Masakhe Foundation. The project focuses on personal and professional youth development in Langa through informal apprenticeships and training in art and information technology, among others. The NPO leases land from the Red Cross (approximately 3 000 m² in Lerotholi Avenue) and has a vision of establishing an urban social farm and incorporating food gardening as a practical training and networking component for the youth to complement its existing arts facilities and programmes. The SAUFF Trust has helped accelerate and integrate the food component of this vision, and assisted in developing a business plan for the farm that is aligned with the NPO's overall vision. The SAUFF Trust will also provide capital funding and technical support for farm design and operational planning. Many of the lessons learnt from the Good Hope Lab informed this collaboration.



The second project, the Langa Urban Farmer Collaboratory, is a partnership with the local civil-society organisations Langa Quarter and Urban-Rural Development, and the City's local subcouncil. Many separate small-scale food gardens in Langa currently source and purchase inputs (such as seeds and compost) and find markets for selling their produce independently

of each other. The Langa Urban Farmer Collaboratory seeks to bring these separate food gardens together in an informal cooperative so as to coordinate the collection of inputs and the sale of produce, and to share knowledge and networks. From this strengthened position, these farmers will have expanded opportunities for growth, market access and further development.

Furthermore, the SAUFF Trust collaborates with the City on an ongoing basis in relation to urban agriculture and food security, with the aim of supporting and building networks of farmers, microfarmers and food gardeners in various communities.

Sustainability lessons

SDG 2: Zero hunger: Target 2.1 (p.101)

SDG 11: Sustainable cities and communities: Target 11.3 (p.102)

The SAUFF Trust outreach projects seek to build communities by involving them in developing solutions, and by promoting social cohesion, collaboration and partnerships. The projects further aim to address major social challenges by bringing the many benefits of urban social farming, such as improved safety and security, as

well as education, training and awareness, to communities across Cape Town. At the same time, they address historical inequities in accessing natural resources and build community resilience to shocks such as climate change (SDG 11).

The trust's projects alleviate poverty by improving household food and nutrition security, and helping urban microfarmers and food gardeners gain access to agricultural inputs, markets and, thus, a form of income. They also ensure access to nutritious food for all, and supporting small-scale farmers. Furthermore, the SAUFF Trust's contribution to skills development and training in urban agriculture, and support for local food-related SMMEs, help create economic opportunities. These objectives align with the targets of SDG 2: Zero hunger.

In general, urban food gardens and social farms offer a multitude of social, economic and environmental benefits. They provide learning and skills development opportunities, improve safety and security, promote social cohesion, and help build community resilience, while enhancing urban greening and supporting biodiversity efforts. Through experimenting with, developing and applying innovations and models, the SAUFF Trust leverages and scales up these positive impacts.





Economic portfolio

The economic portfolio features projects that are designed and implemented to stimulate economic activity and generate economic growth. Projects in this section are aimed at creating sustainable employment opportunities, alleviating poverty and ensuring optimal use of existing resources in a responsible and balanced manner.



Project 10: Cape Town-Aachen robotics symposium

Problem statement

The field of robotics is evolving rapidly worldwide. Whether autonomous cars or service robots, the interest in and application of mobile robotics is increasing. The robotics community benefits considerably from the exchange of knowledge and the use of open-source software.

Project outline

When a delegation from Aachen visited Cape Town in early 2019 in relation to the 20th anniversary of the twin cities partnership, many common interests and associated robotics projects were identified on both sides. After a fruitful discussion with partners from universities in the Cape Town region (Stellenbosch University and the University of Cape Town), as well as Nelson Mandela University in the Eastern Cape, South Africa, a need for more intense exchange and collaboration in the field of mobile autonomous robotics was identified. This led to the idea of a conference to be hosted in July 2019 in order to establish a German-South African forum to exchange research ideas, find project partners and strengthen ties between researchers and practitioners from the two countries.

Project design

Stellenbosch University and FH Aachen organised the first Cape Town-Aachen robotics symposium, with support from the Robotics Association of South Africa. The event involved a wide range of contributions and themes, from robotics research and applications, to education and outreach programmes that use robotics to enhance students' interest in the fields of science, technology, engineering and mathematics (STEM).

Project implementation

Having secured considerable support for the event, and input on its potential focus, Stellenbosch University's Stellenbosch Institute for Advanced Study (STIAS) was chosen as the symposium venue for the event on 1 and 2 July 2019. The programme covered the following fields:

- robotics in classrooms or other educational activities;
- agricultural applications;
- urban search-and-rescue robots;
- unmanned aerial vehicles (UAVs) and flying robots;
- wildlife conservation; and
- autonomous unmanned ground vehicles (UGVs).

As noted by one of the keynote speakers, Prof Alexander Ferrein (FH Aachen, MASCOR Institute), who is involved in a range of German–African research and education projects, there are considerable opportunities for collaboration in the field of mobile autonomous robotics. Together with colleague Prof Stephan Kallweit (FH Aachen, MASCOR), he underlined the vision of joint development work by the universities of Stellenbosch and Aachen, and a stronger exchange of ideas between students, researchers and lecturers on both sides. South African keynote speakers Dr Willie Smit and Dr Willem Jordaan (Stellenbosch University) reiterated the need for collaboration, and generated a range of concrete ideas for possible joint projects for a wide variety of applications and sectors, including research, education, outreach, academia, industry, government and the NGO sector.

Sustainability lessons

SDG 9: Industry, innovation and infrastructure: Target 9.2 (p.101)

The inaugural Cape Town–Aachen robotics symposium provided a number of lessons. Debate on the various symposium themes and topics delivered the following conclusions and recommendations:

- **UAV technology:** As the need to protect and preserve wildlife in protected areas in South Africa becomes more urgent, interest in the use of mobile robotics, whether ground or air-based, to protect threatened species is increasing. A range of research groups are already working in this field, including a group of roboticists from the FH Aachen MASCOR Institute who are supporting local rangers. However, there is a need for greater exchange between the individual research groups, and for a more integrated structure to, for example, enable applications for government grants, such as European Commission research projects.
- **Robotics in education:** Robots and programming can play a significant part in education, not only in a university setting, but also at school level. New and affordable technologies can prepare and train the next generation of roboticists. Notably, the use of open-source software, such as the well-known Robot Operating System (ROS), which nearly all the participants at the symposium had used, may prove useful in education environments. In addition, open-source software and hardware can also play a role as a technology incubator in South Africa.
- **Agriculture:** In relation to agriculture, as a primary South African and Western Cape industry, robotics can have a strong impact in addressing Cape Town's challenges. Considering that Cape Town is a water-scarce city, for example, robotic spraying systems can irrigate crops with precision and efficiency, and thereby achieving considerable water savings.

- **Solar plants:** A notable research focus and priority of Stellenbosch University is the design, operation and maintenance of solar power plants. In particular, the manual cleaning of these plants' parabolic mirrors is labour intensive and time consuming. However, a combination of ground-based and aerial-mobile robots may provide an alternative to manual cleaning. Controlled via a ground station (in less remote areas), the robots could maintain the solar power plant autonomously, or could be teleoperated. To start collaboration on this project, a dataset for a simulation environment was initiated for a first evaluation of possible kinematics and algorithms to be performed.

Overall, it was clear from the Cape Town-Aachen robotic symposium that collaboration in this field could create significant value for all researchers involved. The symposium format also proved vital for collaboration, knowledge exchange and joint project development, and aligns closely with SDG 9 targets, including supporting "domestic technology development, research and innovation in developing countries".





Project 11: Philippi catalytic precinct project

Problem statement

The Philippi horticultural area (PHA) has a long history as the breadbasket for the Cape Town metropolitan area, delivering an annual yield of more than 100 000 tonnes of fresh produce. Its microclimate is ideal for producing horticultural crops, and the abundance of water from the Cape Flats aquifer makes this 3 000 ha of farmland the most productive peri-urban agricultural hub in South Africa. However, only a third of the horticultural land is cultivated, while the rest is fallowed, or used as dumping sites. In recent years, the Philippi area has also faced challenges such as the growth of formal and informal settlements, a lack of social and physical infrastructure, a lack of adequate access to and from the area, extreme poverty, and associated community breakdown. Therefore, realising the economic potential of Philippi will require coordination, networking and collaboration between stakeholders. There is also a need for interlinked physical infrastructure programmes, complemented by economic strategies.

Project outline

The City of Cape Town recognises that the distinct features of the landscape in Philippi make it an ideal location for agri-processing. For this reason, the area has been identified as one of Cape Town's primary catalytic nodes to promote inward densification and sustainability. To build Philippi into a thriving urban hub, the City is developing an economic strategy that comprises tailored interventions based on the unique opportunities in the area.

The Philippi urban agriculture initiative is one of several game-changing developments set to trigger a catalytic shift in the area. This initiative aims to develop vertically integrated agricultural value chains for the Philippi area by engaging the SMME sector to promote a thriving economic community.

Project design

The City, investors and community leaders agree that a holistic approach to the redevelopment of Philippi is needed to facilitate economic growth. In line with this, the City's vision for Philippi forms part of a broad approach to tackle apartheid spatial planning through transit-oriented development. This involves positioning the area as a pivotal node to help make the city more economically and socially integrated.

The urban agriculture initiative will be supported through grant funding to establish a food processing hub, a science-based training hub to explore different types of farming, and an organic waste-to-fertiliser plant to divert waste from landfills. The development of key catalyst sectors in Philippi will see significant job creation and drive social development, education and safety.



Project implementation

In 1998, the City and the Western Cape Provincial Government commissioned a section 21 company, the Philippi Economic Development Initiative (PEDI), to support business activities and create job opportunities in the area. With a permanent presence in the community, PEDI facilitates conversations with the community, forges partnerships and develops strategies to stimulate economic activity in Philippi. This has involved navigating community factions and structures, managing expectations, identifying needs, and collaboratively determining priorities.

Projects worth over R1 billion (ZAR) are now in progress in Philippi. These include:

- the support and improvement of the Philippi Fresh Produce Market (PFPM) for future use as a market channel option for small-scale and community farmers with low profit margins;
- identifying the best opportunities to establish and support manufacturing and processing businesses associated with agricultural value chains; and
- growing the “organic waste to organic compost” project, which produces compost for urban farmers.

Lastly, to build the skills base in the community and surrounding areas, PEDI manages the Philippi Urban Agriculture Academy (PUAA), which trains emerging farmers to become suppliers of fresh produce. The methodologies employed at the PUAA are shared with a growing network of urban small-scale farmers to bring their crops to a standard that can be traded at the highest price in local, national and international markets.

Sustainability lessons

SDG 2: Zero hunger: Target 2.3 (p.101)

SDG 12: Responsible consumption and production: Target 12.2 (p.102)

The value of urban agriculture cannot be overstated. This important local economic sector helps ensure food security by providing healthy and affordable food to the city's poorest residents, and also stimulates economic growth and addresses unemployment. In addition, urban agriculture enables the production of fresh, nutritious food with limited carbon and water footprints, while conserving land and reducing emissions and waste. The objectives of this project support SDG 2 by providing small-scale farmers with access to resources, knowledge, markets and opportunities. Similarly, in line with SDG 12, the project promotes the sustainable management and efficient use of natural resources.

To ensure the inclusive transformation of the Philippi area, the City has developed a precinct-level economic strategy that integrates large infrastructure projects, such as transit-oriented development and the identification of strategic sites for medium-density mixed-use housing developments, with smaller civil-society projects in the area. By adopting an integrated economic strategy for Philippi, this project demonstrates the need to work collaboratively and transversally across line functions and sectors.

Similarly, the City's precinct approach to unlocking economic opportunities and strengthening community partnerships offers a new perspective on how to address hard-infrastructure deficiencies and stimulate an area's economy. This, however, is a gradual process and requires long-term forward thinking to effectively mainstream sustainability principles and operate sustainably.





Project 12: Western Cape Economic Development Partnership

Problem statement

Cities worldwide are facing megatrends such as urbanisation, rapid depletion of natural resources, climate change, and socioeconomic dynamics, resulting in severe development challenges. To address these challenges, leaders need to embrace more sustainable innovations and solutions.

At the heart of sustainability-oriented solutions and innovations is the ability of multiple actors, within different social and institutional boundaries, to work together in a coordinated way. The City of Cape Town's commitment to collaboration is reflected in its slogan "Making Progress Possible. Together". Due to increasing constraints on public-sector funding, the City's programmes need to leverage resources and mandates outside its control to deliver on the Integrated Development Plan (IDP) and other strategic policies and plans.

Project outline

Over the past decade, the Western Cape Economic Development Partnership (EDP) has developed and refined a partnership approach to economic development that promotes the alignment of economic, social, environmental and spatial governance strategies. This is aimed at improving the performance of economic systems and services such as water, energy, food security, public transport, community and business safety, and urban resilience. It further seeks to improve governance for socioeconomic development, and to promote greater responsiveness in the "authorising environment" to business and market needs, community ideas and initiatives, as well as scientific data and analysis.

Project design

The EDP's work focuses on establishing sustainable partnership initiatives to tackle complex ongoing challenges or unutilised opportunities. The partnership process encompasses the following six stages:

- **Stage 1:** Analyse the system. This requires the examination of the system to identify the real issues that require solving, and to understand the relationships within the system. By identifying enablers and inhibitors, stage 1 results in a shared understanding of the root causes of the issues, based on data and real-time information.
- **Stage 2:** Identify partners and stakeholders. This stage involves identifying the stakeholders relevant to solving the issues, deciding on the types of partnerships required (formal or informal, transversal, intergovernmental, cross-boundary and/or cross-sector), and initiating the process of establishing cross-cutting teams to work across silos. Stage 2 typically takes the form of a workshop(s), in which a broad range of role players are included. Partners and stakeholders are assessed in terms of their impact on the issue and the system, the strength of the relationships between them, and their relative importance in the search for collaborative solutions.
- **Stage 3:** Engage stakeholders. In this stage, the key stakeholders from across sectors and with different roles and powers are enlisted. Functional and legitimate processes for managing these stakeholders are co-designed, and collaboration and integration start to be embedded. Stage 3 results in a shared understanding of issues, accountable governance structures, and mutual accountability.
- **Stage 4:** Enable partners. The fourth stage focuses on increasing partners' capabilities to deliver on their shared actions. This entails building adaptive leadership capability within teams, thinking and acting

systemically, and prioritising intentional learning. One of the key results of this stage is an achievement of scale through diffusion, communities of practice, and the extrapolation of principles and values.

- **Stage 5:** Prioritise interventions. Stage 5 focuses on the collaborative development of a set of solutions to be implemented through an incremental, problem-driven and iterative approach that promotes experimentation, innovation and learning. Impact-oriented work is prioritised during this stage, and partnership focus areas are identified. The output from this stage is mutual agreement on a set of priorities and joint actions.
- **Stage 6:** Reflect, learn and adapt. This stage requires that time and resources be allocated to allow for reflection and learning, and that knowledge be shared with partners. Reflection on both successes and failures is essential to stage 6, so as to adapt solutions and strategies in response to lessons learnt.

Project implementation

Formally established in April 2012, the EDP has worked with the City of Cape Town in several areas, including economic development strategy, economic intelligence, regional communications and branding, and engagement with business leaders and civil-society groups on critical issues, such as energy, water and housing.

An example of the working relationship between the EDP and the City is an assessment recently undertaken in Mfuleni to understand the concerns of various stakeholders. Mfuleni is a rapidly growing residential area in Cape Town with limited economic potential. Over a decade ago, the City invested in the development of a business hive in Mfuleni. While the centre supports small businesses, it needs to be upgraded and transformed to promote economic growth and act as a catalyst for economic development. It must become a hub for local manufacturing.

To this end, the EDP and the City embarked on an assessment of stakeholders' concerns. This required analysis and mapping of stakeholders, and a long-term, systematic approach to develop stakeholder relationships and trust. The outcome of this journey is sound relationships between the major stakeholders in the area*.

Relationships were strengthened through one-on-one engagements, workshops and events such as the informal economy summit held in 2019. Other work included the mapping of the Mfuleni centre and surrounding activities to understand how space is utilised, as well as continuous engagement with the forums and businesses in the centre. As a result, a foundational agreement has been reached that the centre must be upgraded and transformed into a fully functional community asset. Along with all stakeholders' buy-in, this agreement is fundamental to the next phase of the redevelopment of the site.

Sustainability lessons

SDG 11: Sustainable cities and communities:
Target 11.3 (p.102)

SDG 17: Partnerships for the goals:
Target 17.17 (p.102)

Achieving socioeconomic development goals and objectives requires increasing partnerships across departments, jurisdictional boundaries, spheres of government and with external sectors, such as the private sector, civil society and academia. The EDP is a partnership builder par excellence, encouraging and supporting effective collaborative ties between stakeholders, in line with SDG 17.

Furthermore, recognising that the challenges cities face are too significant and complex for any single sector, discipline or sphere of government to resolve, the EDP promotes inclusive and sustainable urbanisation

by building capacity for participatory planning and management. To achieve SDG 11, public-sector managers need to rely increasingly on skills and activities such as convening, facilitating, negotiating, mediating and collaborating across boundaries – something that can only be achieved through an integrated partnership system.



*For more information: <https://storymaps.arcgis.com/stories/98f3861f30764a4494145d80e7dc6578>



Project 13: Low-income organic-waste diversion trial in Langa and Wolwerivier

Problem statement

Cape Town's landfill airspace is rapidly dwindling. While the City of Cape Town makes every effort to reduce waste going to landfill, more needs to be done. Since 2018, the Western Cape Department of Environmental Affairs and Development Planning has prioritised organic waste for diversion, while residents have been able to drop off their garden waste at a minimum of 20 City drop-off sites for many years. The City has also provided more than 22 000 home composting containers to residents across the metro free of charge (see p. 73). However, very few waste minimisation interventions are targeted at organic waste diversion in low-income areas.

Project outline

This project sought to identify and pilot two cost-effective approaches for organic food-waste diversion in low-income areas. Working with operational branches of the Solid Waste Management Department and the relevant subcouncils, the City of Cape Town's Waste Minimisation Unit identified Langa and Wolwerivier as suitable locations to test the feasibility of such an intervention. The approach needed to be cost effective and scalable, create local employment, offer local waste beneficiation opportunities and reduced carbon emissions, and result in waste diversion.

A local City-owned property was to be used in Wolwerivier, while available school land (Siyabulela Primary School) was earmarked in Langa. The project aimed to invite 100 participants in each area to participate in diverting their household organic waste.

Project design

The project was registered as an Expanded Public Works Programme (EPWP) research project spanning eight months to allow participants to establish new waste management practices and behaviour. In Langa, the premise was that the learners at Siyabulela Primary would be the conduit through whom participating households' organic food waste would be brought to the project site, where the waste would be composted (i.e. following a drop-off model). In Wolwerivier, however, the appointed EPWP team collected the organic food waste directly from the participants' homes (i.e. following a community waste collection model). No motorised equipment was used to collect the organic waste in either area, as all participants lived within walking distance of the sites.

Collection or drop-off schedules were established and communicated to participants. Participants were each issued with the necessary project information, including guidance on which organic waste should be included, as well as a sealable 5-litre bucket to store their organic waste.

On collection or drop-off day, each participant's details (name and address) were captured, along with the weight of their organic waste, measured using a hanging scale. The team also recorded each participant's compliance with the project requirements. Where needed, additional education and guidance or instructions were provided.

Once the data were recorded, the organic waste from each container was decanted into the designated compost heap, and the containers were cleaned and returned to participants. The organic waste was mixed in with chipped garden waste, watered if necessary, and covered with thick plastic to accelerate the composting process. Compost heaps were turned and watered for six to eight weeks. The compost was then sifted, weighed, and either prepared for use in the adjacent food garden at the Langa project, or supplied to interested community members.

Project implementation

The planned implementation period for this project was October 2019 to May 2020, but ended up being only six months (up to 26 March 2020) due to the national Covid-19 lockdown. During this time, the team collected valuable data, and 20,5 tonnes of organic food waste was diverted from landfills.

During the expected slowdown in the December school holidays, with no learners attending school, the Langa team collected the organic waste directly from the homes of learners who had not gone away for the holidays. To ensure enough feedstock for the compost heaps, the Langa team also recruited a private business that sells fruit and vegetables (Mkenya Fruit Sellers) to redirect its organic waste to the project from December 2019 to March 2020.

From the 100 participants enrolled in each project area, the project achieved an average active participation rate of 42% (Wolwerivier) and 77% (Langa) throughout the six-month trial. Langa participants diverted an average of 7 kg of organic waste per household per month and peaked at 15 and 11 kg per household in the months of February and March 2020 respectively. Wolwerivier participants averaged 19 kg per household per month, peaking at 22 kg per household in January 2020.

Overall, the Wolwerivier project area processed and issued 390 kg of compost to interested community members, including the local crèche, which had its own food garden. In addition, 25 kg of fresh food waste was provided to the local pig farmers every week, totalling 200 kg for the duration of the project. All the compost processed by the Langa project, totalling 4 860 kg, was directed to Siyabulela Primary's food garden. At the end of the project, however, each site still had four unsifted compost heaps.

Sustainability lessons

SDG 11: Sustainable cities and communities:
Target 11.6 (p.102)

SDG 12: Responsible consumption and production:
Target 12.5 and 12.8 (p.102)

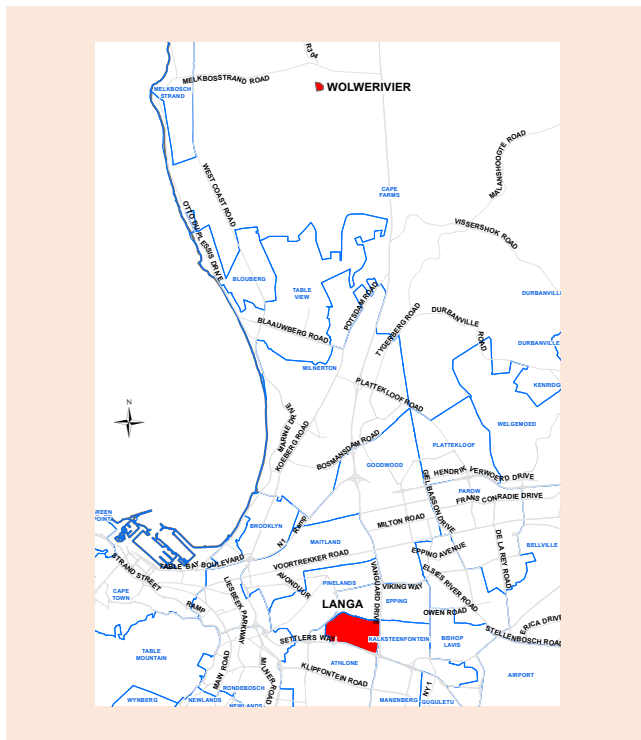
The organic-waste diversion trial in Langa and Wolwerivier achieved multiple sustainability objectives, particularly targets associated with SDG 12 and SDG 11.

It enhanced resource efficiency through diverting organic waste, while at the same time reducing pressure on the City's space-constrained landfills. The diversion of this waste further resulted in reduced greenhouse gas (methane) emissions associated with organic waste,

and generated quality organic compost for various beneficiaries, including food gardens.

Moreover, the project successfully supported local economic opportunities, and facilitated community participation by promoting local employment and waste beneficiation opportunities and facilitating skills development. Community involvement also provided an opportunity to share information on, and raise awareness of, sustainable development and lifestyles.

Finally, by reducing the need for organic waste collection and choosing to process it locally, the project offers a possible way to improve productivity and efficiency for the City's waste collection services going forward.





Ecological portfolio

These projects are directly linked to the capacity of the biosphere to meet the needs of current and future generations. Natural resources are responsibly used and enhanced in the short term to ensure their continued availability in the long term. Projects in the ecological portfolio are primarily focused on empowering people and organisations to undertake their activities and obligations in an ecologically sustainable manner.



Project 14: Aachen city administration's new policy for business trips

Problem statement

Managing air pollution and improving quality of life are important goals for the City of Aachen and can be achieved through various measures. To set an example of sustainable mobility management, the Aachen administration established a new policy for business trips. The policy contributes to more climate-friendly mobility by introducing a new scheme that facilitates intermodality and multimodality.

Based on a dedicated municipal resolution, and strongly supported by the local government, the process commenced in 2014. The initiative provides a strong example of good practice in change management and involves several interlinked areas, such as stimulating behaviour change by readjusting incentives, and promoting sustainable mobility.

Project outline

For many years, the City of Aachen's policy has been to reimburse employees who use their private cars for business trips, and to partially subsidise parking for staff. This, however, incentivised unsustainable mobility modes and behaviour, which contributed to heavy commuter traffic, poor air quality, carbon emissions and less available parking space.

The objective of Aachen's new municipal fleet management approach is to rethink mobility behaviour, to ensure that Aachen leads by example and to pioneer ways to decrease commuter traffic. The initiative seeks to raise awareness of sustainable mobility by introducing the concept of intermodality and multimodality for all employees, thereby reducing CO₂ emissions.

Project design

With the necessary political support in place, it proved beneficial to partner with a specialised consulting company for the operational stage of the initiative. The process comprised three phases, namely analysis, piloting and rollout.

Project implementation

As a first step, the business trips of five centrally located municipal departments were analysed. Data were gathered from all employee drivers, representing 122 private cars and six municipal vehicles (Dienstwagen) and accounting for 2 200 business trips over six weeks.

Details on the distance and time of day of the trips, as well as the number of passengers and amount of luggage, were logged. Through detailed analysis, the likely peak demand for a future carpool were identified. Notably, the information highlighted that almost all trips by the departments analysed could be undertaken with compact cars or even microcars. Based on the analysed data, a carpool was introduced for the pilot department in 2016, and the use of the new system became mandatory for all inner-city departments in 2018.

Since a focus of the initiative was to shift mobility from car-dependent transport to multiple modes, the City also introduced an obligatory hierarchy along with its new fleet concept. Employees who need to undertake business trips are encouraged to either walk, cycle (using their own bicycle or a rental pedelec) or use public transport. Where this is not possible, they can use an e-vehicle from the new City fleet. At times of high demand, with no e-vehicle available, the City collaborates with a local car-sharing partner to cater for "overflow" demand. The logging of route information and vehicle bookings is done through the locally developed app MoVa. A personalised "mobility card" for all employees serves as a ticket for public transport, as well as an access card to the e-cars and rental pedelec stations. The new, fully electric carpool, in combination with car-sharing, public transport and cycling, now forms the backbone of City staff's business trips.

Sustainability lessons

SDG 11: Sustainable cities and communities: Target 11.6 (p.102)

Many lessons have been learnt from this multipronged project. The overall intention of the initiative was to change an established system and mobility practice and facilitate sustainable mobility, thereby supporting enhanced resource efficiency, especially through improving air quality and reducing emissions – all in pursuit of SDG 11.

Today, the new policy serves as an important communication tool for a citywide mobility management programme initiated by the City. As part of this programme, the City of Aachen consults and engages with companies willing to change their mobility management. This can only be done credibly if the City leads by example and is recognised as a "first user". Therefore, the initiative seeks to maximise opportunities for replication.

A number of further important lessons can be drawn from the project. Firstly, cooperating with specialist consultants in performing the structured analysis in the first project phase proved fruitful. In particular, this enabled the calculation of potential emissions savings. Secondly, the availability of funding (national and European Union) was vital for launching the project, as was consistent high-level political support for the shift towards a sustainable new policy for business trips. In this respect, the initiative promotes transparent and democratic processes at a high level. Finally, the project was embedded in the broader context of the Aachen SUMP (Sustainable Urban Mobility Plan), the City's Clean Air Plan and renewable-energy targets. This integrated planning approach provides a robust example of ensuring strategic alignment.

Aachen's new policy for business trips shares synergies and approaches with the City of Cape Town's Travel SMART programme. Travel SMART too was originally aimed at reducing trips by City staff, but was later extended as a pilot to several large employers in the central city to support behaviour change and encourage shifts to more sustainable modes of travelling to and from work.



Project 15: Aachen Euregiozoo supports African penguins

Problem statement

The African penguin has been breeding on Boulders Beach, Simon's Town (along the southern coast of Cape Town, South Africa), since 1986. Initially, the breeding area was limited to a section of Table Mountain National Park (Boulders Beach), which is managed by SANParks (South African National Parks). However, with the steady increase in the number of breeding pairs in Simon's Town, the penguin habitat now extends beyond the national park to areas managed by the City of Cape Town, the South African National Defence Force (SANDF) and private properties.

The penguins breeding in this area face various challenges, including food shortages at sea and regular disturbances while breeding, as the area is mostly open to the public. Disturbances are typically a result of an increase in tourist numbers, dogs that run unleashed on the beach, or wild cats and other predators that move from Table Mountain to coastal areas. Sometimes, penguins select breeding grounds on privately owned properties, which may result in conflict with property owners and residents. In addition, to move between the sea and their breeding ground in Simon's Town, the penguins have to cross busy roads.

The African penguin has been on the IUCN Red List since 2010. Today, only 2% of the historic population remains. To enable the African penguin colony to continue to breed successfully in Simon's Town, local organisers and managers established the Burgher's Walk project (now known as the Simon's Town penguin colony project) in 2008.

Project outline

Although the Aachen Zoo is a relatively small zoo with around 900 animals and 28 employees, it is very popular with Aachen families and attracts around 400 000 visitors per year. Founded in 1966, the Euregiozoo extends over approximately nine hectares, is accessible and centrally located, with low entrance fees and numerous playgrounds. In 2007, the zoo was admitted to the Association of Zoological Gardens, which is an honour reserved only for scientifically managed zoos with strict species protection guidelines and breeding programmes.

The director of the Aachen Zoo, Wolfram Graf-Rudolf, took over the position in 2000. He brought his passion for Cape Town to the job and developed a campaign to protect the African penguin colony in Cape Town, linked to African penguins in the Aachen Zoo.

Project design

As part of the initiative, a toy (stuffed) version of the African penguin named Boldi was introduced as the campaign ambassador. The soft toy is sold for € 10 (approximately ZAR200) in the Aachen Zoo. Boldi is well advertised, and has become a popular souvenir for visitors, in part because the African penguin is the icon animal of the Euregiozoo. The zoo also accepts direct donations in support of the penguins, which go directly to the Southern African Foundation for the Conservation of Coastal Birds (SANCCOB), without recouping any overhead expenses.

Project implementation

The donations from Aachen Zoo are the main source of funding for the management of the African penguin colony at Boulders Beach. New fences and repairs are needed on an ongoing basis to protect the breeding colony, which has shrunk by 1 400 penguins over the past 14 years.



The Aachen donations also fund the salaries of four penguin rangers. Along with a manager funded by the City of Cape Town, the team of penguin rangers monitors the penguin colony in Simon's Town on a daily basis, carries out important counts of breeding pairs, ensure the relocation of penguins breeding in unsafe areas (with heavy traffic or the risk of dogs and wild animals) and carry out important habitat protection projects (such as erecting barriers on busy beaches to reduce the disturbances to breeding penguins). They maintain tourist infrastructure that allows visitors to observe the penguins breeding without disturbing them, and are always available to respond to visitors' questions and ensure that tourists adhere to the barriers and code of conduct for visiting the breeding site. The rangers also communicate and cooperate directly with SANCCOB and transport abandoned chicks and eggs, as well as injured or oily penguins and other seabirds, to the SANCCOB breeding station (sometimes even daily), where the animals are treated by veterinarians, raised and, after rehabilitation, released back into the wild. Between 2012 and 2018,

the penguin rangers transported nearly 2 000 African penguins (eggs, chicks and injured adults) to SANCCOB, of which over 80% have been successfully released back into the wild.

Sustainability lessons

SDG 15: Life on land: Target 15.1 (p.102)

SDG 17: Life on land: Target 17.17 (p.102)

The Aachen Euregiozoo's support for the African penguins at Boulders Beach is proof that a fairly simple, straightforward project and partnership can have a significant impact, as advocated by SDG 17. And by combining awareness raising with direct and accessible "crowdsourcing-type" financial support, the project mobilises financial resources from all sources to conserve the African penguin ecosystem in Cape Town, thereby aligning with SDG 15. Leadership, particularly the zoo director's ongoing commitment to support SANCCOB, has also played a significant part in the success of the campaign.





Project 16: Home composting programme

Problem statement

Cape Town generates more than 2,5 million tonnes of waste every year, of which over 25% is organic waste. When organic waste is landfilled, it decomposes and produces methane gas. The global warming potential of methane is approximately 24 times that of CO₂ over a 100-year period. This is not only detrimental to our environment, but also frustrates the City of Cape Town's efforts to achieve its climate change goals. For this reason, it is critical to find ways to divert organic waste from landfills wherever possible. This will be beneficial for the environment and will have the added benefit of delaying a possible "Day Zero", when landfill space will have run out.

Composting organic waste generates much less methane gas per tonne of waste than when the same waste is landfilled. It also offers socioeconomic benefits relating to soil quality and food security. With these potential benefits in mind, the Waste Minimisation Unit of the City's Solid Waste Management Department began exploring a home composting programme in 2013, which has since evolved into a highly sought-after and successful ongoing initiative of the municipality.

Project outline

The home composting programme enables Cape Town residents to compost their organic waste and divert it from landfills. In an initial feasibility study, the City tested whether residents from different areas in Cape Town would use home composting containers, and how much organic waste per household would be diverted from landfill. Approximately 5 000 home composters per year have been purchased, for phased annual distribution to households, and their rollout has continued since April 2016.

The programme entails the provision of home composting containers, or "home composters", to Cape Town

households free of charge. The composters are equitably distributed to residents living across town. The initiative is designed to encourage the diversion of organic waste at household level and is equally popular and successful in all Cape Town neighbourhoods, irrespective of income level or demographics. The home composting programme is implemented in an integrated manner by various Solid Waste Management operational branches. The programme's primary constraint is budget and resources, so it lends itself to significant expansion should budget and resources increase.

Project design

In the initial feasibility study, the City provided 677 households from four different neighbourhoods with a free home composter and asked them to record and report monthly on the quantity and type of organic waste composted over nine months. The participants were also surveyed on their experience using the home composters. The positive results from this study led the City to purchase and distribute at least 5 000 free home composters per year to residents. It was agreed that the home composting programme would offer composters to Cape Town residents in formal households with a garden or yard, which is a requirement for successful composting.

Initially, residents applied for home composters by completing and submitting an online form and attaching their identity documents and municipal accounts. Once approved, the City would deliver the home composter to the household. In 2017, however, the City introduced an area-by-area approach. Distribution occurs on an area-targeted basis according to a predetermined process. The home composting programme typically distributes more than 5 000 composters in approximately 12 subcouncils every year, alternating between targeted subcouncils from one year to the next to ensure even distribution throughout town.

To ensure fairness, residents collect their home composters from distribution venues such as community halls on a first-come first-served basis. Each home composter is recorded on the recipient's municipal account to keep track of ownership, even though the composter is provided free of charge. Demonstrations and information on how to compost and which organic waste to include are also provided to all recipients.

Project implementation

The results of the home composting programme feasibility study were very encouraging, with 91% of the surveyed residents (616 out of 677 households) actively participating for nine months. An average of 16,9 kg of organic waste per household (composting container) per month were composted during the study, which boded well for the future rollout of home composters.

From participants' reports, it was calculated that an average of 1,48 tCO₂e (tonnes of CO₂ equivalent) are emitted per tonne of household organic waste landfilled, compared to only 0,17 tCO₂e per tonne of waste composted, saving 1,31 tCO₂e emissions per tonne. A number of the participants surveyed also found composting to be useful, and the compost beneficial for their gardens. Overall, the response to the feasibility study was overwhelmingly positive.

In 2016, therefore, the home composting rollout was initiated by means of online application forms. The public response to the rollout was so enthusiastic and overwhelming that the City received over 5 000 applications within five days of inviting residents to apply for home composters. This unexpected demand demonstrated Capetonians' enormous appetite for home composting. Unfortunately, it also placed some strain on the application system and staff's ability to process applications on time. As a result, a number of applicants could not be accommodated in the first rollout phase.

The City also noted that the home composters were not distributed evenly across the city, and that individual home composter delivery came at a high cost in terms of money and carbon footprint.

This led to the switch to an area-targeted composter distribution model in 2017, through which the City has since successfully distributed more than 5 000 home composters per year. The new model ensures equitable distribution of home composters to all subcouncils throughout Cape Town. The on-site distribution teams follow an integrated collaborative approach across various branches of the Solid Waste Management Department, and are guided by a mutually agreed standard operating procedure to ensure that all team members clearly understand their roles.

The on-site teams generally visit two distribution venues per subcouncil – typically community or recreation halls, civic centres or libraries – for two to three days per venue, with a limited number of composters available on each operating day. Residents from many different backgrounds are happy to queue and wait in line to receive their free home composters.

To spread the word about an upcoming rollout, area-specific information is posted on the City's website. In addition, advertisements are placed in community newspapers, on social media and at Council offices a few days prior to distribution day. This is supplemented with face-to-face advocacy by on-site teams, using pamphlets to explain the benefits of home composting to communities.

Since the home composting rollout began in April 2016, the City has distributed more than 22 000 free home composters. If the average household composts about 16,9 kg of organic waste per month, as found in the feasibility study, this equates to the expected composting of more than 370 tonnes of kitchen and garden organic waste per month, or more than 4 440 tonnes per year.

Sustainability lessons

**SDG 11: Sustainable cities and communities:
Target 11.6 (p.102)**

**SDG 12: Sustainable cities and communities:
Target 12.5 (p.102)**

The home composting programme successfully diverts organic waste from landfills. This has a number of environmental sustainability benefits, including a significant reduction in carbon emissions, saving 1,31 tCO₂e emissions per tonne of waste composted, and the minimisation of waste (SDG 11 and SDG 12). A third sustainability benefit is the separation of organic waste at source in individual households. This results in less contamination of other household waste, which can improve its value for potential recycling. Moreover, the home composting programme provides socioeconomic benefits such as improved soil quality and food security, and enables households to grow their own fresh produce more successfully, and potentially distribute it should they wish.

Valuable lessons have been learnt from the programme, including that most communities in Cape Town, irrespective of demographics or income level, appreciate the value of, and are interested in, home composting. These residents are prepared to walk to a venue, queue for a home composter, and carry it back to their households, eliminating the need for expensive and carbon-intensive delivery models. Perhaps the most important lesson, however, has been that environmental and socioeconomic sustainability can be improved through a single programme.





Project 17: Ozone treatment of wastewater at the Aachen-Soers wastewater treatment plant

Problem statement

The Aachen-Soers wastewater treatment plant (WWTP) is the largest sewage treatment plant on the river Wurm. The WWTP's service area extends over 70 km², including central Aachen and its Laurensberg and Haaren districts, as well as parts of the nearby municipality Würselen. The plant has 500 km of sewer canals, comprising 240 km mixed-water canals, 115 km wastewater canals and 145 km rainwater canals, as well as 14 wastewater pumping stations and 16 stormwater retention facilities.

The daily plant load is approximately 60 000 m³ in dry weather conditions, but can increase to 200 000 m³ in wet weather. Fifty per cent of the wastewater treated originates from industrial production (mostly local producers of confectionery products), and the remainder from Aachen households.

In dry weather conditions, the nearby river Wurm contains up to 80% wastewater, discharged mainly from the Aachen-Soers treatment plant. This flows through a nature conservation and recreation area, and later discharges into the river Maas via the Rur, which supplies parts of the Netherlands with drinking water. Therefore, if the wastewater is not sufficiently treated at the WWTP, this can affect the water quality of the Wurm and the production of drinking water in the Netherlands.

While wastewater treatment has significantly improved in recent years, the elimination of substances such as antibiotic residues remains inadequate. These substances, mostly of human origin, may affect plants and animals in the receiving waters, which are already at trace levels. One common example is the presence of endocrine disruptors in waterbodies. These chemicals influence the hormonal system and have an impact on fish populations.

Project outline

An extensive research project is being undertaken to protect the ecologically sensitive watercourse from chemical and microbiological contamination emanating from the large sewage treatment plant. As part of the project, the Eifel-Rur Waterboard has built a large-scale ozonation plant to evaluate the impact of ozone treatment on water quality. More specifically, the aim is to investigate whether a reduction of micropollutants through ozone treatment can help achieve good ecological status in receiving waterbodies. To this end, the river Wurm, as the receiving waterbody, and the Aachen-Soers WWTP were assessed both before and after the implementation of ozonation.

In addition, the project is exploring the optimisation of the ozonation process based on investigations conducted at the pilot-scale plant, with the purpose of contributing to the design of large-scale ozonation plants.

Project design

The ozonation process is the fourth treatment stage for removing trace elements from the wastewater. The large-scale ozonation plant is designed to treat the entire wastewater volume of the Aachen-Soers WWTP. In the two chambers of the contact reactor, the ozone is bubbled into the wastewater via 112 diffusers for at least 12 minutes. After ozonation, the wastewater is treated in a clear water nitrification and sand filtration unit.

Project implementation

The large-scale ozonation demonstration plant at the Aachen-Soers WWTP was launched in April 2018 and is currently the largest of its kind in the European Union. The demonstration facility treats the total water flow of the WWTP. Ozonation has since been implemented as the fourth and final regular purification stage of the wastewater before it is released into the river Wurm.

Sustainability lessons

**SDG 9: Industry, innovation and infrastructure:
Target 9.5 (p.101)**

**SDG 12: Sustainable cities and communities:
Target 12.4 (p.102)**

With wastewater ozonation, ecotoxicity has been reduced and even partially eliminated, with confirmation of a one to three log-level reduction in *E. coli* and enterococci bacteria (including antibiotic-resistant variants). This aligns well with the SDG 12 target of the environmentally sound management of chemicals and all wastes throughout their lifecycle. Initial assessments also point to slight improvements in the overall condition of some aquatic plants in the river Wurm since the ozonation facility has been commissioned, although it remains to be confirmed whether this is due to the ozonation plant or other factors.

In addition, the ozonation project represents an upgrade in technological capabilities to build inclusive and sustainable industries, which supports SDG 9.





Project 18: everwave

Problem statement

It is estimated that a full garbage truck worth of waste is deposited into the world's oceans every minute. This totals 8 million tonnes of plastic a year. If the trend continues unabated, this amount will quadruplicate by 2050.

Worldwide, humans have created five major garbage patches, which have been further shaped by ocean currents. In these patches, marine plastic is concentrated and slowly broken down into smaller pieces and particles. The complex system of currents transports the plastic into the most distant corners of the world. The amount of plastic in the world's oceans is estimated at 150 million tonnes, or roughly a fifth of the weight of all the fish in our seas. Researchers predict that this could grow to one tonne of plastic per three tonnes of fish by 2025. Without drastic intervention, the weight of marine plastic pollution could equal the total weight of all fish in our oceans by 2050.

Plastic has a considerable effect on climate change. The production of plastic releases CO₂ which enters the atmosphere, where it contributes to rising ocean temperatures. The ocean of the future will be warmer and more acidic, with severe effects on coral reefs, biodiversity and marine food chains. Although approximately a quarter of all known marine organisms depend directly on coral reefs for food and habitat, these reefs cover only one thousandth of the ocean floor surface. Rising temperatures result in coral bleaching, causing corals to fade and die. Plastic waste poses an additional risk to corals, as it rubs against and sometimes smothers and harms their surface, and blocks essential sunlight. The decline of coral reefs has a drastic impact on entire marine food chains and ecosystems.

Project design

Plastic waste is harmful to the environment in general, and particularly so when it enters our oceans. The German NPO everwave, launched in 2017, which has recently turned into a social enterprise, has made it their mission to rid rivers and oceans of plastic pollution. To address the problem of marine waste and support healthy oceans, everwave follows a holistic approach that covers both technical and social dimensions of the problem. Therefore, the two interlinked focal points of everwave's work are based on "technical innovation" and "ecological inspiration".

Project implementation

Technological innovation: To prevent more plastic from polluting our seas, everwave is developing solutions along rivers, which transport most of the waste into our oceans.

The development of a specially designed floating platform that extracts plastic waste from rivers before it can damage aquatic ecosystems has been one of everwave's central themes. The platform has progressed from a first small-scale trial, to the first prototypes, to ready-to-use platforms. Development included basic tests of individual components of the platform, as well as complex test rigs where the overall structure of the platform as a whole is investigated. The platform itself is passive, but its structure directs the water so that plastic parts end up in a reservoir. The work on the physical prototype, developed jointly with the Institute for Hydraulic Engineering and Water Management at the RWTH Aachen University, has shown that the principle of passive construction works in practice. Field trials were planned for 2020 to test the platform in rivers.

In addition to the passive platform, a waste collection boat named AILHA (Artificial Intelligence-Enhanced Litter Harvester) has been designed. The basis of the design is a collection boat from an everwave partner that has been adapted to use for plastic collection in rivers.

Sensors on the boat and on flying drones are paired with artificial intelligence, which detect accumulations of plastic waste, and even the composition of the waste. It is anticipated that the boat will be able to detect its surroundings independently, collect plastic waste around the passive platform, and also collect waste from smaller rivers, channels and other areas where the platform cannot be positioned. The data recorded by the sensors and evaluated through artificial intelligence also provide important research inputs. A digital platform is planned next to support the use of the data so acquired.

Ecological inspiration: everwave's second focal point is to raise awareness of important environmental issues, such as marine waste and climate change. Many environmental challenges are interlinked, and education is key to solving them. Through their awareness-raising activities, everwave aims to motivate people to use resources responsibly and consciously, and seeks to demonstrate how sustainable action can be successfully incorporated into everyday life. Work includes interactive events and creative public relations activities, such as the development and introduction of their "EmergenSEA" educational kit.

The educational kit has been developed in cooperation with educators. It is designed to be used in a simple module and as a building block for further education to enable tailored lessons on marine conservation. Educators can set their own priorities, adapt the material to their own needs, and demonstrate the theory with many practical elements, including games and experiments. The kit provides an opportunity to raise awareness of oceans, plastic pollution and resource protection among learners in an interdisciplinary way.

Sustainability lessons

SDG 14: Life below water: Target 14.1 (p.102)

everwave is an NPO, so "funding" and related bureaucratic obstacles are an ongoing challenge that require perseverance from the entire everwave team.

Nevertheless, the organisation is adaptive and flexible. The original idea of everwave was to remove plastic waste from the Great Pacific garbage patch, a large garbage vortex in the Pacific Ocean. However, after extensive consultation with experts and researchers, everwave decided to modify this original mission and make a profound technical shift from an exclusive focus on the open seas to rivers. This adjustment was the outcome of a learning process, and although it brought new technical challenges to the fore, these were outweighed by the benefits. In support of SDG 14, everwave's priority is to prevent plastic waste from entering rivers in the first place,

or at least prevent it from being transported from rivers into the open seas. Collected plastic is also often in a recyclable or upcyclable condition, creating added value for local stakeholders.

everwave believes there is an urgent need to move towards wider deployment to prove that the concept works in practice. To this end, the first field trial was planned for 2020 in Madagascar and the boat is currently in operation cleaning a dam in Visegrad (Bosnia-Herzegovina). In demonstrating everwave's holistic approach, local stakeholders will be engaged in a process of co-creation to find the most suitable approach for the site.





Project 19: Premium Ways into Aachen's greenery

Problem statement

Urban residents and visitors' needs and preferences relating to leisure activities have changed in recent years and have been particularly influenced by Covid-19 lockdowns. Citizens and tourists are increasingly looking for recreational opportunities on their doorstep, requiring the least amount of effort and travel. For this reason, the need for peri-urban greenery is growing.

At present, however, this need is not being met. Challenges relating to urban greenery include that footpaths are not wide enough or are blocked by cars, that there are not enough secure crossings, and insufficient greenery and benches. Access to drinking water, lighting and information in green open spaces is also inadequate. To the City of Aachen, the most important priorities in this regard are to improve pedestrian safety and accessibility, enhance greenery, provide places to rest, enhance the inner-city microclimate, and link tourism signage to regional hiking trails and the intersection system.

Project outline

To this end, the City of Aachen's Urban Planning Department has developed the concept of a network of high-quality walkways into Aachen's greenery. The Premium Ways concept uses walkability and short distances to encourage people to travel on foot instead of by car. The medieval, predominantly "stone" city centre is surrounded by large parks and green corridors in the river valleys, all within a radius of 1-1½ km, or a 20-minute walk. Through Premium Ways, the quality of the main footpaths will be enhanced to make inner-city spaces more attractive. Further objectives are to create specific resting and meeting spots, such as benches at regular intervals (every 200 m), enhance the quality of green open spaces, and improve accessibility and safety.

Project design

The Premium Ways concept comprises 10 paths along Aachen's historic gate roads, which lead radially from the inner city to the outskirts of town. These walkways already connect small district squares and green oases along short routes. In future, crosslinks are planned to connect the radial Premium Ways so as to form a "green ring".

Project implementation

Premium Ways is a large-scale project that will be implemented in phases. To allow for proper coordination and a step-by-step approach, a timeframe of up to 15 years is anticipated to final completion.

One of the paths in urgent need of development is Premium Way 3. This will improve the footpath connection between the city centre and the densely populated Frankenberger district (with its green spaces around the Frankenberg castle and the Moltkepark), which is, in turn, connected to the outer green areas. In addition to expanding the sidewalks and adding trees and humps at the crossings, the most important improvement will be the redesign of the district square along the street. The square is currently more of a parking area than a square for pedestrians. Plans for the square are to reduce the number of parking lots significantly, narrow the street, unseal the square, enlarge plant beds considerably, and add benches, lighting and a "play point".

During the 2019 European Mobility Week, three public participation events were hosted, namely "Fair together" (a mobility pop-up store in the city centre) and two guided walks around Premium Ways 3 and 7. These events were used to gather citizens and residents' inputs and have the City's plans evaluated.

Sustainability lessons

**SDG 11: Sustainable cities and communities:
Target 11.4 and 11.7 (p.102)**

SDG 13: Climate action: Target 13.1 (p.102)

Supporting both SDGs 11 and 13, the project is a key element of the 2022 city centre concept, which will be gradually implemented. Results and inputs from the Premium Ways public participation processes have been integrated with the City's Traffic Development Plan 2030, objectives for active local mobility, and measures for climate change mitigation and adaptation.

As desirable as the vision of the completed network is, implementation is to be undertaken step by step. In this process, an overview of measures is firstly drafted, which includes site plans, rough cost estimates and a prioritisation process. Measures are then specified and funding applications submitted. To remain cost-efficient, the measures are coordinated with the local utility company and other stakeholders to ensure that all planned pipeline work is completed before structural changes are made. The routes are developed one by one to avoid the disrupting the disbursement of approved funds due to human resources being otherwise engaged or constrained.

While Aachen has vocal and active cycling associations, a strong lobby for pedestrian traffic does not exist, which means that competition is fierce for space on the Premium Ways. In addition to space for pedestrians, the Premium Ways are also intended to provide space for trees and greenery. Therefore, citizen participation and sound communication are vital for the success of the project.



Project 20: Source to Sea river corridor project

Problem statement

Cape Town's natural environment is its strongest economic asset. Yet ecological and social degradation is also the city's most significant sustainability challenge. Heavily engineered and polluted urban rivers have resulted in degraded habitats and damaged urban ecosystems, which tend to become negative open spaces associated with "crime and grime". The challenge is to transform socially and ecologically fragmented river corridors and realise their green infrastructure value and benefits for adjacent communities.

Restored river corridors will contribute to the ecological, social and economic sustainability of these important assets and will deliver a range of benefits. Along many of Cape Town's waterways, the opportunity exists to create extensive, interconnected footpaths that can link communities and provide urban and peri-urban recreation. Corridor restoration projects provide an important platform from which to engage various stakeholders and promote optimal working relationships and holistic management of urban protected areas and riverine systems. Broadening access to natural assets, generating employment, improving safety and security, and transforming negative open spaces are all issues that could be holistically and innovatively addressed by reversing ecological degradation and implementing sound river management principles.

Project outline

The Source to Sea river corridor pilot currently focuses on river corridors in the Zandvlei catchment, which connects Table Mountain National Park (a nationally protected area) with Zandvlei estuary (a protected municipal area). The project seeks to enhance the quality of life for local communities, while maximising recreational opportunities and protecting ecosystem services. It also prioritises the management of water quality and quantity so as to support biodiversity. In addition, the project hopes to provide non-motorised transport (NMT) routes and contribute to the green economy.

The founding partners of the project are the City, SANParks, ICLEI: Local Governments for Sustainability, and the Wildlife and Environment Society of South Africa (WESSA). It is hoped that additional partnerships will be forged as the project grows.

Project design

Source to Sea aims to maximise urban natural recreational space by restoring degraded river corridors and waterways, thereby encouraging their use. The rivers meander through varied socioeconomic areas and allow for a wide range of stakeholders to be part of the transformative vision, with the added benefit of potentially enhancing social cohesion.

Many of the aims and objectives of Source to Sea are similar to those of the Aachen Premium Ways project (p. 81), as both cities seek to increase safe access to pedestrian and NMT routes in existing green corridors. With its Premium Ways, Aachen is looking to encircle the city and link it with pathways in its urban core. A similar opportunity exists in Cape Town through the development of a number of designated and mapped pedestrian routes. Many of these routes, such as the one explored by a recent Aachen delegation visiting Cape Town, follow a specific historical or heritage theme, such as monuments to the city's slave history or its heritage water resources.



Project implementation

Source to Sea comprises a number of different elements, one of which is the river ambassador programme, a partnership between the City and the NGO Cape Town Environmental Education Trust (CTEET). The programme trains previously unemployed residents in a range of skills relevant to river corridor management and maintenance, including rehabilitation, community engagement and pathway creation, and then deploys them to work on the river corridor.

Communication and awareness tools such as a website and video have been developed. These communicate the vision for, and information on, the project with a view to facilitating further stakeholder engagement. A curriculum-based “Adopt a River Reach” education programme has also been introduced to engage schools situated in close proximity to the river. In addition, the programme provides an opportunity for the river corridor to serve as an “outdoor classroom” for learners.

In support of a green infrastructure approach, a project is being initiated to de-canalise and re-naturalise a section of the river to demonstrate the resilience benefits of creating liveable urban waterways.

Sustainability lessons

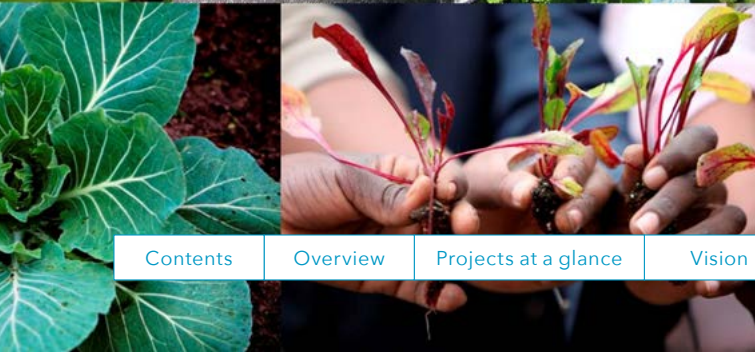
**SDG 11: Sustainable cities and communities:
Target 11.7 (p.102)**

SDG 13: Climate action: Target 13.1 (p.102)

This project could present a classic chicken-or-egg causality dilemma: Until the paths and corridors are perceived as safe, few residents will make use of them; however, one of the best ways to improve safety would be by increasing foot traffic. Furthermore, the difficulties associated with integrating socioeconomic groups along the corridor could hamper project development. Resource constraints pose a further challenge to project implementation and the ability to retain people in job creation programmes. The river ambassador programme hopes to overcome the retention challenge by offering accredited qualifications, which have shown to be a retention factor for people involved in other, similar programmes. Although collaborative partnerships (both internal and external to the City) have been a strength of the project, these take sustained effort to develop and maintain.

While much can be learnt from similar initiatives in other countries, the South African context is unique. Although the need for well-maintained functional river corridors and corresponding recreational areas is undeniable, it stands alongside many other social needs that could be considered of higher priority. However, the Covid-19 pandemic has highlighted the importance of urban green spaces, and the physical and mental health benefits they provide.

Despite the many challenges to overcome, Source to Sea represents an innovative way to solve multiple urban challenges in an inclusive intervention, aligning with SDGs 11 and 13, and could strengthen Cape Town’s position as a leader in sustainable urbanisation in Africa.



Project 21: The Aachen Climate Ticket

Problem statement

Everyone has a carbon footprint. In Germany, average emissions are approximately 11 tCO₂e per person per year. By adopting more climate-conscious lifestyles (flying less, consuming less animal products, or turning down a thermostat), per person emissions can be reduced. Nevertheless, irrespective of lifestyle and consumer choice, individuals cannot completely avoid emitting greenhouse gases. The Aachen Climate Ticket initiative seeks to raise awareness of, and respond to, this reality.

Project outline

Where CO₂ emissions cannot be completely avoided, emissions can be offset by (co-)financing climate protection projects that would otherwise not be implemented or, at least, not to the same extent. The primary purpose of the Aachen Climate Ticket is to compensate for aviation emissions that cannot be avoided in one part of the world, by funding projects that both mitigate climate change and support sustainable development in another part of the world. In addition, the initiative seeks to raise awareness of global interconnectedness and foster cooperative north-south relations.

Project design

While the concept of CO₂ offsets may seem a common, although not yet mainstream, practice today, the Aachen Climate Ticket was initiated over 10 years ago. The project is designed for voluntary compensation targeted at individuals who want to offset their aviation emissions. It is currently the only local climate ticket in Germany and, therefore, the only local initiative of its kind that directly supports measures in Aachen's sister city, Cape Town.

Project implementation

The partnership association uses the financial compensation for CO₂ emissions caused by air travel to support projects that contribute to climate protection and support food security, service delivery and sustainable livelihoods in low-income areas in Cape Town.

The mechanism is simple: For every flight hour, €5 is collected as the estimated carbon offset amount of the resulting emissions. Since the start of the project in 2009, the Climate Ticket has raised more than €40 000, which has made a significant contribution to local, small-scale projects in Cape Town, with visible outcomes.

Donations are administered as transparently as possible. All operational work is done on a voluntary basis by long-standing and trusted members of the partnership association. Thus, all financial compensation is put towards the projects, without recouping overhead costs or handling fees. The donations are made available to projects of partner organisations in Cape Town, such as Abalimi Bezekhaya and other community-based organic food garden projects. The funds are used for, among others, horticultural training of young farmers, cultivation of seedlings, buying and selling of compost and manure, and planting and maintenance of windbreak hedges. The donations also support food garden projects in local schools and help fund irrigation systems, such as pumps and rainwater collection tanks. This contributes to sustainable livelihoods, and considerably improves nutrition available to local microfarmers and households. Abalimi Bezekhaya, in particular, supports women.

Unemployed township residents of all ages receive training, which equips them with the knowledge and confidence to continue practising and improving their skills. Farmers are supported to grow their own organic vegetables to feed their families, and, if the harvest exceeds their own needs, to sell their produce to markets outside their immediate neighbourhoods. This supports

sustainable livelihoods, food security, and improved family nutrition. Notably, surpluses also support the well-being of single mothers who have no alternative forms of income. If vegetables are marketed directly, small farmers benefit from a secure and fair income, and customers receive vegetables that are reasonably priced, organically grown and locally produced.

Sustainability lessons

SDG 2: Zero hunger: Target 2.1 (p.101)

SDG 13: Climate action: Target 13.1 (p.102)

Currently, air travel does not internalise or reflect the true costs of carbon pollution and associated climate impacts. Until there is a proper price on carbon, voluntary carbon offsets provide a step in the right direction. Therefore, the Aachen Climate Ticket helps enhance resource efficiency in general, and climate mitigation in particular, through offsetting aviation emissions, in support of SDG 13.

Interestingly, the organisers have noted that information about the Climate Ticket often raises awareness of the consequences of air travel, and of habits, lifestyle and consumer choices more broadly. This is often used as an entry point for further learning and behaviour change.

In addition, the food system in Cape Town, as in most other cities globally, is changing, in a way that is not always favourable to farmers and local market structures. Therefore, a further aim of the Climate Ticket, through its partnership with CBOs and community-based gardens in Cape Town, is to improve food security and support short food chains and local food systems. Thus, in line with SDG 2, the project seeks to alleviate poverty by addressing basic needs, supporting livelihood development and improving access to income.



Project 22: Waste education at the Aachen Stadtbetrieb

Problem statement

According to German law, if waste cannot be avoided, it must be separated to promote reuse, recycling or recovery. In general, the generation and management of waste should conserve raw materials and protect people and the environment. In this regard, five priority levels are pursued, namely:

- avoidance;
- preparation for reuse;
- recycling (materials recovery);
- other recovery, in particular energy recovery and backfilling; and
- removal.

To achieve this goal, buy-in at all levels is needed to deal with waste. For this reason, the Aachen Stadtbetrieb (municipal utility company) has developed a set of waste education interventions to raise awareness and facilitate behaviour change.

Project design

To Aachen's municipal utility, a pedagogical approach to waste avoidance is key: Teaching environmental awareness and sustainable behaviour starts with young children. Therefore, the Waste Consulting Department has created a waste education programme specifically targeted at kindergartens, schools and other education institutions, which provides various materials and initiatives to raise awareness from an early age, in a playful and barrier-free manner.

Project implementation

Playful approach - sustainable from childhood: Aachen's municipal utility company offers guided tours of its waste management premises from April to September. During these tours, waste consultants introduce small groups of children to the work of waste management and city cleaning. With the help of the "Ton Berta"³, knowledge about waste separation is conveyed in a playful way. In the waste management yard, the children can experience what has been collected in the city by emptying a street sweeper. The tours are free of charge for all daycare centres and primary schools in Aachen.

In a further effort to introduce children to waste avoidance, the municipal authorities organised an art competition in 2016. Children were invited to create artwork on the themes of waste collection, city cleaning and waste separation. The Stadtbetrieb received more than 180 entries, many of which were featured on the 2017 waste calendar. With a print run of around 70 000, the calendar informs Aachen households about collection schedules and additional offers from the Stadtbetrieb's Waste Management Department.

Moreover, children are sensitised to the work of the Waste Management Department through a handicraft sheet of their own "garbage truck for the home". The sheet is available for download on the Stadtbetrieb's website, and from waste collection teams as a giveaway when waste is collected.

For the past 20 years, the Aachen municipal company has also been distributing lunchboxes (around 2 000 per year) to all Grade 1 learners in the city area, while waste advisors provide tips for a low-waste breakfast. In 2015, a toy campaign was launched with the slogan "The best waste is waste not produced". Once a year, the campaign allows children to hand in a toy they no longer use in exchange for another. This provides an opportunity for learning and experiencing waste avoidance and sustainability in

practice. The campaign has received considerable positive feedback and has been replicated in surrounding cities.

Educational work on waste prevention does not target children only. The Aachen city authorities also provide many incentives and materials for adults. To convey the message of plastic avoidance and sustainability, the "plastic bag exchange campaign" was initiated in 2016. Plastic bags can be exchanged for high-quality bags of certified organic cotton. The plastic bags collected were subsequently sent for professional recycling. In 2018, in turn, the "coffee-to-go campaign" was launched to avoid the use of disposable cups. Here, citizens could win a limited-edition high-quality porcelain cup displaying the city silhouette. Significant information about plastics, reusable materials and sustainability was provided as part of the competition.

Information - uncomplicated, anywhere and anytime:

In addition to these specific campaigns, the waste advisors of the municipal company also regularly attend various trade fairs, where they distribute a significant volume of information material. These include the annual "Euregio Wirtschaftsschau" with more than 100 000 visitors, open days in the districts, and at the depot or central contact points in town.

In addition, the Aachen municipal company promotes waste avoidance, sustainability and recycling throughout the city by means of flyers, brochures, the annual waste calendar, vehicle branding, posters and stickers, and on the internet with its own "Waste ABC". For instance, the "sorting aid", a flyer in A4 format, is available in seven languages and explains how to dispose of the respective waste types correctly. Waste advisors are also available telephonically or on email to guide Aachen citizens in terms of waste management practices.

³ Ton Berta is a garbage can come alive, with a unique persona, that helps youth relate to waste management and environmental sustainability in a child-friendly way.

Sustainability lessons

SDG 4: Quality education: Target 4.7 (p.101)

SDG 12: Responsible consumption and production: Target 12.5 and 12.8 (p.102)

The proper handling of waste is critical for environmental protection. The Aachen Stadtbetrieb regards waste education as a decisive factor in pursuing environmental sustainability and climate protection, thereby pursuing

SDGs 4 and 12. This includes promoting waste-conscious consumer behaviour, sustainable use of products, and the correct handling of waste. In relation to the latter, consistent waste separation improves recycling success and, thus, reduces resource and material use, the energy consumption required for producing materials and, importantly, associated CO₂ emissions. The consultants from the Waste Management Department are committed to achieving these objectives.



As a blueprint for global development, the SDGs bring together all stakeholders to address the complex challenges we face, including poverty, inequality, climate change, environmental degradation, peace and justice.



The sustainable development goals - a massive co-creation effort

Guest column by Dr Dorothea Ernst⁴

Five years ago, the United Nations launched the 2030 Agenda for Sustainable Development with the telling title “Transforming our World”. The 2030 Agenda is detailed in the 17 sustainable development goals (SDGs) and 169 subgoals, addressing the main global challenges humanity currently faces. The SDGs are remarkable in that, only 70 years after the end of the Second World War, humanity managed to set itself bold common goals - in a peaceful though tough negotiation process - involving all nations and stakeholder groups, including policy bodies, business, NGOs, education, spiritual organisations and civil society.

The various stakeholders had learnt important lessons from former processes and agendas. The previous UN Agenda, the millennium development goals (MDGs), which applied from 2000 to 2015, focused on developing economies, while developed economies could continue with “business as usual”. This had the uncomfortable result that, although most of the eight MDGs were achieved, global challenges such as climate change, pollution and migration had increased, mainly to the disadvantage of the poor.

With a third of the SDGs’ validity period having passed, it is time to take stock. In recent years, I have witnessed a remarkable increase in dialogue and understanding of the scale and nature of the transformation required.

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In my perspective, this became possible because the SDGs offer all people in the world a common conceptual and action frame, and – probably even more importantly – a common language.

The coloured icons of the SDGs, for instance, are universal and easy to use. Nowadays, the SDG icons are found everywhere: on beer mats, T-shirts, conference announcements, in business sustainability reports, schoolbooks, and now also in this joint Mayor’s Portfolio of Urban Sustainability.

The joint Mayor’s Portfolio of Urban Sustainability, which includes a set of projects from the City of Aachen and their framing in terms of the SDGs, is quite special, as sustainable development has played a major part in the Cape Town–Aachen partnership since its establishment 20 years ago. The city-city partnership in itself is a strong illustration of SDG 17. Since its early days, the partnership has embraced the three principles of sustainability, learning from each other, at eye level. While preparing the Aachen Mayor’s delegation for its visit to Cape Town in 2019, a mapping of all partnership activities was done. This revealed that the focus of the partnership activities in the past had been on SDGs 1, 2, 4, 13, 15 and 16. The use of the icons helped highlight and acknowledge our work to date, and enabled us to start envisioning common interests for future cooperation.

Where are we now?

In 2021, we find ourselves in the midst of the global Covid-19 crisis. The virus slowed humanity down, raised

awareness of global, national and local aberrations, increased digital (especially videoconferencing) literacy, and ignited an amazing level of creativity and entrepreneurship. It has also reminded us of how fragile and precious life is. And it has taught us that we can change our behaviour quickly if life is threatened. In fact, Cape Town experienced a similar shock during the water crisis of 2017 and learnt its lesson well. This offers hope that transformation is indeed possible. It is a question of individual intention, courageous leadership and clear direction, which the SDGs provide.

Agenda 2030 is global. Implementation, however, happens locally. Cities or regions will play a major part. They are small enough to be overseen, and, at the same time, complex enough to represent the entire socioeconomic system that needs to be transformed from an unsustainable, linear value-chain-dominated, profit-driven approach to a circular economy, in which multiple impacts – ecological, social, economic and personal – are balanced. Different concepts such as Kate Raworth’s doughnut economy are currently being explored at city level. Co-creation and trustful collaboration, at eye level, are key success factors of these endeavours, which prove to hesitant political and business leaders and decision makers that alternative ways of organising human life are possible, viable and, in fact, favourable.

I am confident that we have a bright future ahead of us, provided that we have the courage to step up and each contribute our small piece of the puzzle to “Transform our World”.

Conclusion

The partnership between the cities of Aachen and Cape Town has made a meaningful contribution to urban sustainability in both cities. This joint publication showcases projects and initiatives that have been realised through the partnership, highlights the value of this longstanding cooperation, and celebrates the deep collaboration and mutual support that has characterised it. More broadly, the publication provides an opportunity to continue sharing knowledge and lessons between the two cities on implementing and embedding sustainability in our projects and services delivery, and deepen our understanding of sustainability in our respective socioeconomic, environmental and spatial contexts.

Many of the projects featured in this Cape Town–Aachen Mayor’s Portfolio of Urban Sustainability are driven by education institutions that form part of the partnership, and highlight the importance of knowledge-sharing, intercultural exchange and cooperative learning. These include the Good Hope Lab, school exchanges programme and the Hlumani community centre. Other projects are led by the cities of Cape Town or Aachen and are of mutual interest to both, or involve synergy or similar approaches. The projects such as Premium Ways into Aachen’s greenery and Source to Sea are examples of such synergy, with both projects seeking to enhance green infrastructure and improve access to green public open space in the respective cities. Both projects also involve broad participation and engagement with wide-ranging stakeholders, and an integrated approach to green open-space planning. Finally, the publication contains initiatives led by stakeholders from civil-society, cultural and business institutions involved in the Aachen–Cape Town partnership. These include Open Streets Cape Town and the Oranjezicht City Farm outreach.

All the projects in this publication are closely aligned with, and seek to further, one or more of the SDGs and the 2030 Agenda for Sustainable Development, in the spirit of the Aachen–Cape Town partnership. They also contribute to the growing body of knowledge and practice with regard to urban sustainability in both cities.

The publication brings a number of lessons to the fore. It highlights the importance of multistakeholder partnerships for knowledge sharing and the mobilisation of resources and experiences. This type of collaboration is essential to achieve sustainability in our highly dynamic and interconnected world. It underscores the complexity of navigating and embedding sustainability in different socioeconomic and environmental contexts. In addition, it demonstrates the importance of reflection, flexibility and responsiveness while embedding sustainability in projects, policy and service delivery.

Finally, the Cape Town–Aachen Mayor’s Portfolio of Urban Sustainability illustrates project managers’ creativity, innovation and commitment to sustainability, both in the two city administrations and in partner organisations. We hope this inspires project managers in both cities to replicate and implement the lessons captured in this publication, continue embedding sustainability principles in project planning, implementation and management, and strive towards a better and more sustainable future for all. To this end, the cities of Aachen and Cape Town will continue cultivating and building on their partnership to further the common goal of a sustainable future in both cities.

Zusammenfassung

Die Partnerschaft zwischen der Stadt Kapstadt und der Stadt Aachen hat einen bedeutenden Beitrag zur Verwirklichung von urbaner Nachhaltigkeit in beiden Städten geleistet. Diese Publikation stellt Projekte und Initiativen vor, die im Kontext der Partnerschaft realisiert wurden oder von besonderem Interesse sind und unterstreicht den Wert dieser langjährigen Partnerschaft. Darüber hinaus bietet die Publikation die Möglichkeit, den Wissens- und Erfahrungsaustausch zwischen unseren Städten über die Umsetzung und Verankerung von Nachhaltigkeit in unseren Projekten und Dienstleistungen fortzusetzen und unser Verständnis von Nachhaltigkeit in unseren jeweiligen sozioökonomischen, ökologischen und räumlichen Kontexten zu vertiefen. Schließlich bietet sie die Gelegenheit, der intensiven Zusammenarbeit und gegenseitigen Unterstützung Anerkennung zu zollen, die diese Partnerschaft kennzeichnet.

Die Publikation stellt verschiedene Partnerschaftsprojekte vor. Viele dieser Projekte werden von Bildungseinrichtungen vorangetrieben, die ein Teil der Partnerschaft sind, und unterstreichen die Bedeutung von Wissensaustausch, interkulturellem Austausch und kooperativem Lernen. Dazu gehören die "Good Hope Lab", Schüler*innenaustausche und das "Hlumani Community Centre".

Darüber hinaus werden in der Publikation Projekte vorgestellt, die für beide Städte von gegenseitigem Interesse sind, Synergien beinhalten oder ähnliche Ansätze beider Städte hervorheben. Die „Aachener Premiumwege“ und das „Source to Sea river corridor project“ sind Beispiele für eine solche Synergien, bei denen beide Projekte darauf abzielen, die grüne

Infrastruktur und den Zugang zu öffentlichen Grünflächen in beiden Städten zu verbessern. Darüber hinaus beinhalten beide Projekte eine breite Beteiligung und Einbindung verschiedenster Interessengruppen sowie einen integrierten Ansatz für die Planung von grünen Freiräumen.

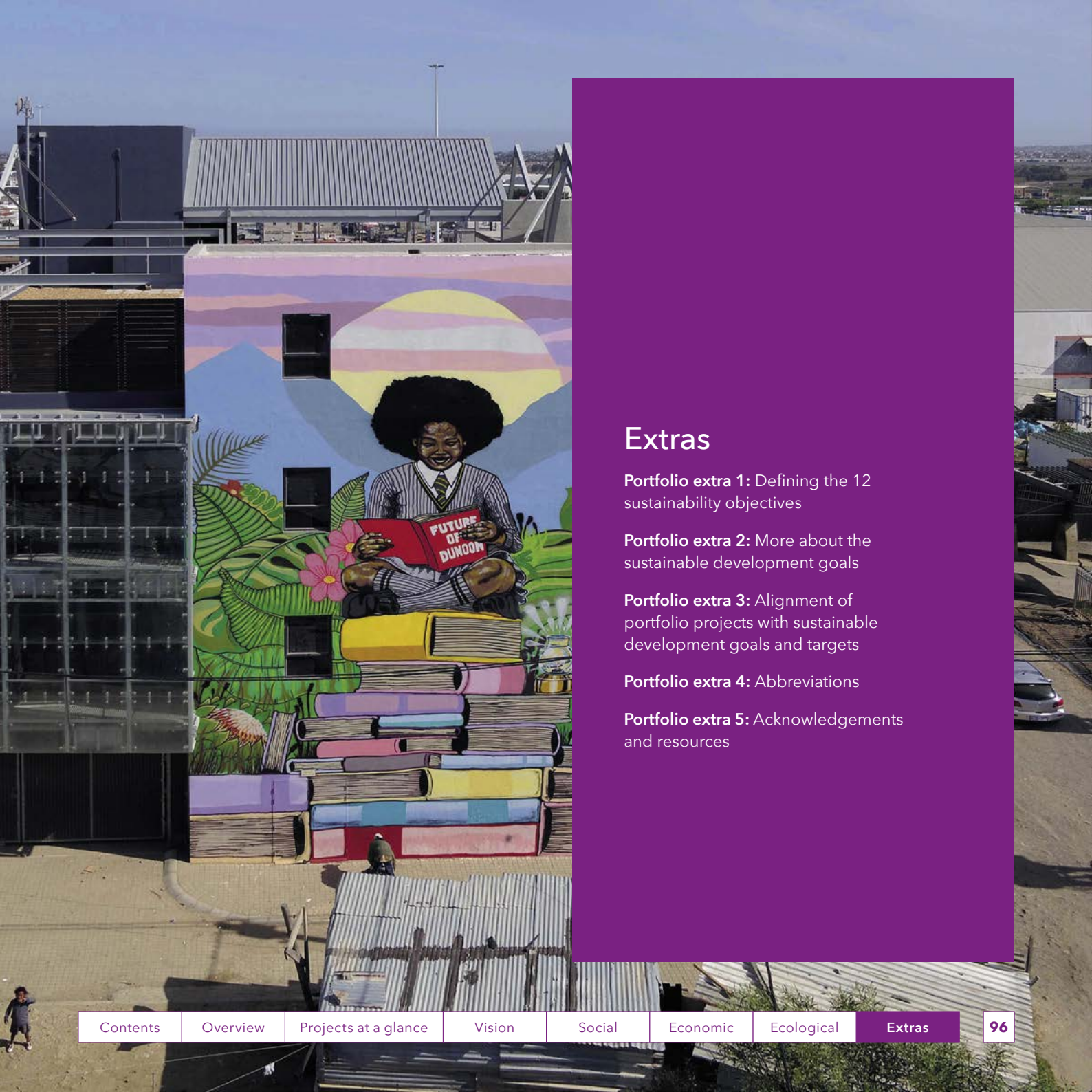
Schließlich werden Initiativen vorgestellt von Akteuren aus der Zivilgesellschaft, kulturellen Einrichtungen und Unternehmen, die an der Aachen-Kapstadt Partnerschaft beteiligt sind. "Open Streets Cape Town" und die "Oranjezicht City Farm" sind Beispiele für Initiativen, die durch die Partnerschaft unterstützt und gefördert wurden.

Alle Projekte in dieser Publikation sind eng auf eines oder mehrere Nachhaltigkeitsziele [SDGs] und die Agenda 2030 ausgerichtet und versuchen, diese im Sinne der Aachen-Kapstadt Partnerschaft zu fördern. Darüber hinaus tragen diese Projekte alle zum wachsenden Wissen und der Praxis der urbanen Nachhaltigkeit in beiden Städten bei.

Die Publikation rückt eine Reihe von Lehren in den Vordergrund: Sie unterstreicht die Bedeutung von Multi-Stakeholder-Partnerschaften für den Wissensaustausch und zur Mobilisierung von Ressourcen und Erfahrungen. Eine solche Zusammenarbeit ist für die Verwirklichung von Nachhaltigkeit in unserer hochdynamischen und vernetzten Welt unerlässlich. Sie unterstreicht die Komplexität im Lenken und Verankern von Nachhaltigkeit in unterschiedlichen sozio-ökonomischen und ökologischen Kontexten. Außerdem zeigt es die Bedeutung von Reflexion, Flexibilität und Reaktionsfähigkeit im Prozess der Einbettung von Nachhaltigkeit in Projekten, Politik und Dienstleistungen.

Schließlich zeigt die Publikation Kreativität, Innovation und Engagement der Projektmanager*innen für Nachhaltigkeit, sowohl innerhalb der Verwaltung beider Städte als auch bei beteiligten Partnerorganisationen. Wir hoffen, die in dieser Publikation festgehaltenen Erkenntnisse motivieren Projektmanager*innen in beiden Städten, nachhaltiges Planen wiederholt umzusetzen. Das gemeinsame Portfolio der Bürgermeister*innen soll Verantwortliche in beiden Verwaltungen ermutigen,

weiterhin Nachhaltigkeitsprinzipien in Projektplanung, -durchführung und -management einzubinden und eine "bessere und nachhaltigere Zukunft für alle" anzustreben. Zu diesem Zweck werden die Stadt Aachen und die Stadt Kapstadt weiterhin ihre Partnerschaft pflegen und ausbauen, um unser gemeinsames Ziel einer nachhaltigen Zukunft in beiden Städten voranzutreiben.



Extras

Portfolio extra 1: Defining the 12 sustainability objectives

Portfolio extra 2: More about the sustainable development goals

Portfolio extra 3: Alignment of portfolio projects with sustainable development goals and targets

Portfolio extra 4: Abbreviations

Portfolio extra 5: Acknowledgements and resources

Portfolio extra 1: Defining the 12 sustainability objectives

1. Building community, for example through:

- facilitating community participation;
- promoting collaboration and building partnerships; and
- promoting social cohesion.

2. Improving quality of life, for example through:

- promoting health and well-being;
- improving living and working conditions, and promoting dignified human settlements; and
- enhancing participation in arts, culture, sports and heritage.

3. Addressing major social challenges, for example through:

- addressing the legacy of apartheid;
- improving safety and security; and
- promoting education, training and awareness.

4. Creating economic opportunities, for example through:

- creating jobs and promoting job creation;
- supporting SMMEs; and
- supporting the informal economy.

5. Improving productivity and efficiency, for example through:

- utilising resources efficiently;
- removing barriers to service delivery; and
- promoting beneficial partnerships.

6. Alleviating poverty, for example through:

- meeting basic needs;
- supporting livelihood development; and
- improving access to income.

7. Enhancing resource efficiency, for example through:

- improving water availability, reducing demand and increasing efficiency;
- promoting energy efficiency and increasing the use of renewable energy; and
- promoting urban densification and efficient land use.

8. Promoting and enhancing ecological integrity, for example through:

- conserving sensitive ecosystems and biodiversity;
- conserving and enhancing ecosystem functions and benefits.

9. Addressing major environmental challenges, for example through:

- reducing the incidence of invasive species;
- reducing waste and pollution, and improving air and water quality; and
- addressing historical inequities in accessing natural resources.

10. Ensuring strategic alignment, for example through:

- promoting cooperative governance and aligning with provincial, national and international priorities and responsibilities; and

- ensuring alignment with key policies and strategies.

11. Facilitating community engagement, for example through:

- building communities' capacity for engagement;
- facilitating public input into governance; and
- supporting existing community structures and initiatives.

12. Promoting transparent and democratic processes, for example through:

- ensuring responsiveness to public needs, and adaptive management in changing contexts;
- promoting access to information; and
- ensuring replicability of project principles/methods.

A successful sustainable development agenda relies on partnerships between governments, the private sector and civil society.



Portfolio extra 2: More about the sustainable development goals

In September 2015, the UN General Assembly (all member states) adopted the 2030 Agenda for Sustainable Development along with the sustainable development goals (SDGs), or the “global goals for sustainable development”. The global goals address the global challenges we face, including those relating to poverty, inequality, climate change, environmental degradation, peace and justice. The aim of the agreement on these goals is to commit efforts towards ensuring that people around the world live better, without damaging the environment, and to promote a better and more sustainable future for all. The SDGs are a universal call to action to “end poverty, protect the planet and improve the lives and prospects of everyone, everywhere”. The 17 goals are all interconnected, and are based on the principle of “leaving no one behind”. In terms of Agenda 2030, member states will work towards achieving these goals within the 15 years from 2015 to 2030. Of specific relevance to the Aachen–Cape Town LA21 Partnership, the aim of goal 11⁵ is to “[m]ake cities and human settlements inclusive, safe, resilient and sustainable”.

The 17 SDGs are as follows:

- **Goal 1: No poverty** – “End poverty in all its forms everywhere.”
- **Goal 2: Zero hunger** – “End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.”
- **Goal 3: Good health and well-being** – “Ensure healthy lives and promote well-being for all at all ages.”
- **Goal 4: Quality education** – “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.”
- **Goal 5: Gender equality** – “Achieve gender equality and empower all women and girls.”
- **Goal 6: Clean water and sanitation** – “Ensure availability and sustainable management of water and sanitation for all.”
- **Goal 7: Affordable and clean energy** – “Ensure access to affordable, reliable, sustainable and modern energy for all.”
- **Goal 8: Decent work and economic growth** – “Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.”
- **Goal 9: Industry, innovation and infrastructure** – “Build resilient infrastructure, promote inclusive and sustainable industrialisation, and foster innovation.”
- **Goal 10: Reduced inequality** – “Reduce income inequality within and among countries.”
- **Goal 11: Sustainable cities and communities** – “Make cities and human settlements inclusive, safe, resilient, and sustainable.”
- **Goal 12: Responsible consumption and production** – “Ensure sustainable consumption and production patterns.”

⁵ Sustainable cities and communities.

The Aachen-Cape Town Partnership fosters a highly collaborative north-south relationship, and has seen both cities working towards and supporting urban sustainability in their respective contexts.

- **Goal 13: Climate action** - "Take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy."
- **Goal 14: Life below water** - "Conserve and sustainably use the oceans, seas and marine resources for sustainable development."
- **Goal 15: Life on land** - "Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss."
- **Goal 16: Peace, justice and strong institutions** - "Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels."
- **Goal 17: Partnerships for the goals** - "Strengthen the means of implementation and revitalise the global partnership for sustainable development."



Portfolio extra 3: Alignment of portfolio projects with sustainable development goals and targets



Target 2.1: 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.

Target 2.3: 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.



Target 4.1: Build and upgrade education facilities that are child, disability and gender sensitive and provide safe, non-violent, inclusive and effective learning environments for all.

Target 4.7: Ensure that all learners acquire the knowledge and skills needed to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture's contribution to sustainable development.



Target 7.2: Increase substantially the share of renewable energy in the global energy mix.



Target 8.9: Devise and implement policies to promote sustainable tourism that creates jobs and promotes local culture and products.



Target 9.2: Support domestic technology development, research and innovation in developing countries.

Target 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.



Target 11.2: Provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety.

Target 11.3: Enhance inclusive and sustainable urbanisation and capacity for participatory, integrated and sustainable human settlement planning and management in all countries.

Target 11.4: Protect and safeguard the world's cultural and natural heritage" in order to "make cities and human settlements inclusive, safe, resilient and sustainable.

Target 11.6: Reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management

Target 11.7: Provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities.



Target 12.2: Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products.

Target 12.4: Achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment.



Target 12.5: Substantially reduce waste generation through prevention, reduction, recycling and reuse.

Target 12.8: Ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.



Target 13.1: Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.



Target 14.1: Prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.



Target 15.1: Mobilise and significantly increase financial resources from all sources to conserve and sustainably use biodiversity and ecosystems.



Target 17.17: Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships, monitoring and accountability.

Portfolio extra 4: Abbreviations

CO₂	carbon dioxide	PFPM	Philippi Fresh Produce Market
CBO	community-based organisation	PHA	Philippi horticultural area
DEDAT	Western Cape Provincial Government's Department of Economic Development and Tourism	PUAA	Philippi Urban Agriculture Academy
EDP	Western Cape Economic Development Partnership	RWTH	Rheinisch-Westfälische Technische Hochschule
EPWP	Expanded Public Works Programme	SANCCOB	Southern African Foundation for the Conservation of Coastal Birds
IDP	City of Cape Town Integrated Development Plan	SANParks	South African National Parks
KERIC	Khayelitsha Education Resource and Information Centre	SAUFF Trust	South African Urban Food and Farming Trust
MoA	memorandum of agreement	SDGs	sustainable development goals
MoU	memorandum of understanding	SMME	small, medium and micro-sized enterprise
MW	megawatt	STAWAG	Stadtwerke Aachen AG
NGO	non-governmental organisation	SUMP	City of Aachen Sustainable Urban Mobility Plan
NMT	non-motorised transport	tCO₂e	tonnes of CO ₂ equivalent
NPO	non-profit organisation	UAV	unmanned aerial vehicle
OSCT	Open Streets Cape Town	UN	United Nations
OZCF	Oranjezicht City Farm	WESSA	Wildlife and Environment Society of South Africa
PEDI	Philippi Economic Development Initiative	WWTP	wastewater treatment plant

Portfolio extra 5: Acknowledgements and resources

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