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## **SOUTH-TO-SOUTH SOLUTIONS: AN EXCHANGE OF AUSTRALIAN AND LATIN AMERICAN DESIGN APPROACHES TO THE UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS**

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### **ABSTRACT**

This paper reports on the Design-for-Sustainability (DfS) approaches practiced in Australia, Brazil, Argentina, Colombia and Peru to help achieve the United Nations Sustainable Development Goals (SDG). The study is part of a project funded by the Council on Australian Latin American Relations (COALAR) titled 'South-to-South: activating Australian Latin American Cooperation through Sustainable Design Education', which is a collaborative endeavour of DfS educators from 8 universities in the above-named countries. The current phase of the project involves an initial collection of 60 case studies of products, services and systems that deliver positive impacts to society, the environment and the economy in the Australia and Latin America. The SDG case studies will be shared, discussed and built on during the upcoming LeNS South-to-South educators' symposia, students' workshops and research collaboration dialogues.

Keywords: Design for sustainability; United Nations Sustainable Development Goals; sustainable solutions.

## 1. INTRODUCTION

Apart from experiencing seasons opposite to those in the Northern Hemisphere, countries in the Southern Hemisphere share many similarities in the sustainability challenges that they face. Containing some of the largest countries in the world both by area and by population, the Southern Hemisphere also has countries which have the world's largest biological capacity reserves to regenerate renewable resources and to absorb wastes.

This paper reports on the Design-for-Sustainability (DfS) approaches practiced in Australia, Brazil, Argentina, Colombia and Peru to help achieve the United Nations Sustainable Development Goals (SDG). The study is part of a project funded by the Australian Government's Council on Australian Latin American Affairs (COALAR) titled 'South-to-South: activating Australian Latin American Cooperation through Sustainable Design Education', a collaborative endeavour of DfS educators from 8 universities in the above-named countries. Participants are also members of the LeNS (Learning Network on Sustainability), an association of DfS educators from 125 higher-education institutions in 27 countries, working to diffuse sustainability capacity through innovative curriculum development.

The current phase of the project involves an initial collection of Australian and Latin American case studies of products, services and systems that deliver positive impacts to the society, the environment and the economy in the Southern Hemisphere. This SDG case study collection will be disseminated, shared, discussed and built on during the upcoming LeNS South-to-South educators' symposia, students' workshops and research collaboration dialogues.

The South-to-South project is ongoing, and its progress will be presented during the LeNS World Conference.

## 2. CASE STUDIES

Sixty case studies were collected and categorized according to the 17 global goals which they contribute towards. Due to space constraints only a sampling of the cases are presented below.

### 2.1 SDG 1: No Poverty

Despite being amongst the world's 20 richest countries, Australia has a homelessness problem, with over 13,700 'rough sleepers' who live on the streets, sleep in parks, squat, stay in cars, or live in makeshift dwellings (AIHW, 2018). The 'Backpack Bed' from the Melbourne-based social enterprise Swags for Homeless Ltd is an attempt to give dignity and emergency relief to people who are sleeping rough. This weatherproof tent with padded mattress, made of lightweight street-tough material, offers full-body protection year-round against mosquitoes and winter chills. It has lockable storage pockets for valuables and can be easily rolled-out then rolled-in to a rucksack after use.

### 2.2 SDG 2: Zero Hunger

In 2004, OzHarvest Ltd was launched in Sydney to stop the food from the hospitality industry going to waste and to redistribute them to people in need; it thus became Australia's first food rescue organisation. Now partnered with over 3,500 food donor businesses nationwide, OzHarvest collects perishable surplus food and delivers it directly and free-of-charge to over 1,300 local charities (OzHarvest, 2017). Their food rescue vans collect fruit and vegetables, meat, cooked meals and prepacked vacuum items, dry goods, cakes and baked goods, drinks, dairy and eggs, as long as they're still safe to consume and in good condition. In 2017, it opened Australia's first surplus food supermarket, the OzHarvest Market in Sydney, based on a 'take what you need, give if you can' philosophy, making the food available to those having difficulty in making ends meet.

The City of Curitiba in Brazil's south is internationally acclaimed as a world leader in urban sustainability. It has been running its 'Câmbio Verde' (Green Exchange) initiative since 1991. Catadores (informal waste pickers) wheel their carts of salvaged recyclables, plastic bags and used cooking oil to the trash collection centres and trade these for fruit, vegetables or eggs: 4 kg of recyclables buys 1 kg of fresh produce. About 10,000 catadores participate in this program to earn their living; however other Curitiba residents can also access this 'trash-for-food' exchange service. Câmbio Verde helped reduce the litter from waterways as well as the incidence of mosquito-borne diseases.

### 2.3 SDG 3: Good Health and Well-being

When Australia's Royal Flying Doctors Service (RFDS) began its operations in 1928, it became the world's first air ambulance. Ninety years later, it has become one of the largest and most comprehensive aeromedical response organisations in the world, providing emergency and primary health care services for people in rural, remote and regional Australia. In 2018, with its 71 aircraft and 124 healthcare vehicles in 23 air bases, the RFDS doctors, dentists and nurses travelled 27 million km to deliver vital health services and transport 113,375 patients by air and road; provide 21,828 dental care episodes; conduct 16,209 clinics; and provide 88,188 telehealth consultations.

From 7 am to 2 pm on Sundays and public holidays, over 120 km of Bogotá's main roads are temporarily closed off to private cars and opened only to cyclists, runners, skaters, pedestrians and public transport. Known as the Ciclovía (Cycleway), this Bogotá tradition started in 1974 and approximately 2 million people participate weekly. An offshoot of the Ciclovía is the Recreativa (Recreation), wherein aerobics and yoga instructors and musicians engage the people in the car-free streets in dancing, physical exercise and sports activities. Bogotá's Ciclovía as an approach to engage the public in weekly fitness and health activities in pedestrian- and cyclist-priority city streets has been replicated in many other municipalities and cities in Latin America.

#### 2.4 SDG 4: Quality Education

In 1951, the School of the Air at Alice Springs broadcast its first lessons by two-way radio to students in the vast Australian outback. Using a transceiver, teachers in major inland towns discussed the mailed-in learning materials with the remote primary and early secondary students. After the one-hour lesson on air, the students work through their assignments with their parents or older siblings, which will be submitted to the teacher by post or via the Royal Flying Doctor Service. Almost 70 years later, over a dozen more branches have opened in other regional towns, and the School of the Air continues to help geographically dispersed learners reduce their educational disadvantage. Just like in a physical classroom, there is daily contact between students, home supervisors and teachers, but remotely through the constantly evolving technologies for distance communication; often the school serves as the remote student's avenue for socialization outside their family. Covering an area greater than 1.3 million square kilometres, the School of the Air has been dubbed as 'the world's largest classroom'.

#### 2.5 SDG 6: Clean Water and Sanitation

Australia is the driest inhabited continent on Earth, with 70% of the land surface desert to semi-desert. Water resources are scarce, so in 1989, Australian sanitaryware manufacturer Caroma Industries Ltd patented the 'dual-flush' toilet to cut water usage in half compared to traditional toilets. Dual-flush toilets are now mandatory for all new buildings in Australia and are exported to over 30 countries worldwide.

#### 2.6 SDG 7: Affordable and Clean Energy

The Australian Government's Small-scale Renewable Energy Scheme offers householders and small businesses financial incentives to purchase and install solar photovoltaic (PV) panels, wind turbines, hydro systems, solar water heaters, and air source heat pumps. As a result, more than 2 million Australian homes have rooftop solar, with an average of 6 panels being installed per minute (Clean Energy Council, 2018). Rooftop solar work like decentralized mini-power stations and help reduce demands on the electricity network.

#### 2.7 SDG 8: Decent Work and Economic Growth

The Brazilian social enterprise Escama Studio social enterprise produces are bags, jewellery, belts and over-garments, hand-crocheted by local artisan women from underprivileged communities, using mostly of 100% post consumer aluminium-can pull-tabs supplied by recycling centres in the neighbourhood. The hangtag of each product bears the photo, bio and signature of its artisan ([www.escamastudio.com](http://www.escamastudio.com)).

In Peru, the 'ponchila' – a backpack ('mochila') with a built-in poncho – represents a community attempt to redirect plastic packaging away from landfilling or ocean dumping. Citizens were invited to return their plastic bottles for recycling; in 2017 the collection produced 6,000 ponchilas, each being made from 80 PET bottles. In the hope of reducing school dropouts, the ponchilas were handed out to poor children in the Andes who travel to school in often inclement weather.

#### 2.8 SDG 9: Industry, Innovation and Infrastructure

In 1988, the Reserve Bank of Australia issued the world's first polymer banknote as currency, a commemorative 10 AUD note. Co-developed with the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the University of Melbourne, the polymer banknotes were developed to combat forgery. The polymer banknote had see-through panels and embedded holograms as anti-counterfeiting features; they were also more durable, more environment friendly, and less likely to carry dirt and disease. In 1996 all Australian banknotes switched to plastic and now more than 50 countries use polymer banknote technology on more than 150 denominations.

#### 2.9 SDG 10: Reduced Inequality

In 2014 Orange Sky Australia – the world's first free mobile laundry service for the homeless – was launched in Brisbane. A van fitted out with two large washers and dryers, an electricity generator and water tanks, to visited homeless hotspots, offering free clothes washing services. By 2017 Orange Sky had 17 vehicles around Australia, and completed 34,508 loads of washing for the homeless. Through these actions, the homeless are given dignity and respect apart from the clean clothes.

#### 2.10 SDG 11: Sustainable Cities and Communities

Curitiba is highly-regarded a world leader in public transportation innovation. Their success in this area is mainly due to the bold and visionary political leadership of Jaime Lerner, who served as its mayor for three terms. In 1974 Lerner pioneered the first-wide scale use of the Bus Rapid Transit (BRT) concept, which is like a 'surface subway', consisting of dedicated bus lanes with fast and frequent services, and enclosed transit stations with platform-level boarding and pre-boarding fare payment, essentially emulating the performance and amenities of high-capacity railways but at a fraction of the cost. In 1992 Curitiba became the first city to use 'bi-articulated buses', which are triple-length buses with two linked trailer sections that can carry up to 270 passengers and equipped with five doors to enable passengers to quickly enter and exit; these features allow the city to move a ridership of 10,640 passengers per hour per direction in its 7 BRT corridors of busways totalling 74 km. The Linha Verde (Green Line), opened in 2009, have buses running on 100% soybean biofuel while the Interbairros 1 (Inter-neighbourhood) line have been using hybrid diesel-electric buses since 2012. A uniform 'tarifa social' (social fare) is charged regardless of distance or transfers made; thus the shorter journeys subsidize the cost of the longer journeys of the low-income residents who

live further away, making the system accessible to all. With 70% of Curitiba's population commuting via the BRT, the city enjoys the cleanest air amongst the large Brazilian cities, largely due to its BRT. To ensure the fleet remains clean, safe and comfortable, BRT buses are retired after 3 to 4 years and repurposed into mobile libraries, job skills training classrooms, soup kitchens, health clinics, and day-care centres that are free for low-income citizens.

Curitiba's achievements and experience inspired many cities in Latin America and other developing countries to adopt BRT as a mass mobility option to move large volumes of passengers at high speeds and with low infrastructure cost. To date, 55 cities in 13 countries in Latin America have 171 BRT corridors spanning 1,816 km and moving 20,506,977 passengers per day ([www.BRTdata.org](http://www.BRTdata.org)).

The City of Medellín, once feared for being the most dangerous place on earth, is now celebrated for their many transport innovations, including the Metrocable gondola lift system. Intended to provide affordable mobility to the informal settlers living on the steep hills surrounding the city, this is the world's first cable-propelled system dedicated for urban public commuting. Inaugurated in 2004, the Metrocable has been carrying 30,000 people daily.

### 2.11 SDG 12: Responsible Consumption and Production

The REDcycle program is a national retailer-operated initiative to recover soft plastics from consumers, with collection bins placed outside Australia's largest supermarket chains, Coles and Woolworths. The collected plastic bags are processed by Replas Products Pty Ltd into various recycled-plastic products, including outdoor furniture, bollards and signage. Since REDcycle Pty Ltd started in 2011, over 542 million pieces, or 2.1 tonnes, of flexible plastic have been prevented from getting into landfill, the beaches or the waterways.

Boomerang Bags is a grassroots community initiative which offers an alternative to plastic bags by providing durable fabric bags for shoppers to use for free. Community groups come together to sew bags out of donated or found material. These bags are made available in shopping centers and the public are encouraged to take a bag and return it (like a boomerang) when they are finished with it. Started in 2013, the Boomerang Bags movement has since grown to 860 communities worldwide, with 205,603 fabric bags created. The movement hopes to shift society's throw-away mentality towards repurposing and reuse. In South America there is a Boomerang Bags group in Rio de Janeiro.

In Repair Cafés volunteer repairers meet up to help their neighbours fix their bikes, clothing, appliances and other broken household goods. Grounded on their slogan – 'Throw out? No way!' – patrons and volunteers at Repair Cafés attempt to extend and optimize the useful life of possessions and delaying their final disposal into the environment. First established by Martine Postma in Amsterdam in 2009, the Repair Café model can now be found in over 1500 sites in more than 30 countries (Postma, 2013). There are currently at 30 Repair Cafés around Australia and 3 in New Zealand; in South America they are found in Santiago de Chile, and in Porto Alegre and Santos in Brazil.

MobileMuster is the product stewardship initiative of the Australian mobile phone industry, voluntarily funded by all of the major handset manufacturers and network carriers. MobileMuster accepts for recycling all brands and types of mobile phones, batteries, chargers and accessories, without charging any fees. Its extensive collection network provides 3,500 public drop off points at post offices, mobile phone retailers and other shops, workplaces, schools, local councils, and repair stores and service centres, as well as a free post-back option. Since its launch in 1998, MobileMuster has collected and recycled 1,412 tonnes of mobile phone components (AMTA, 2018).

'Clean Up Australia' was the idea of Ian Kiernan, after he was appalled by the pollution and rubbish in the oceans while yachting around the world. In 1990 Kiernan launched 'Clean Up Australia', and 300,000 volunteers turned up. The first Sunday of March was designated as 'Clean Up Australia Day', and the movement has become the largest community-based environmental action in the country. Every year, Clean Up Australia publishes 'The Rubbish Report', which provides a snapshot of the types of rubbish collected on the day. This information was used to advocate for container deposit legislation, after seeing that the PET bottles, glass bottles, and aluminium cans are consistently in the top 10 items found (CUA, 2017). In 1993, with the support of the United Nations Environment Program, Kiernan launched the international campaign 'Clean Up the World' and this is now held every 3<sup>rd</sup> weekend of September worldwide; over the last 25 years, 35 million people have joined in the effort, in 48,792 environmental projects in 130 countries. The Clean Up the World movement proved that this simple Australian idea has enough universal appeal to mobilize millions of people around the globe to take responsibility for their own environment.

### 2.12 SDG 14: Life Below Water

The Return Unwanted Medicines (RUM) Project is an Australian Government funded scheme that enables community pharmacies to retrieve unwanted and out of date medications from consumers without any cost. Unwanted medicines pose the danger of being misused, abused, or pose harm to children. They are often also thrown into the bin or disposed down the sink or toilet, which could endanger marine life. The RUM Project minimizes these social and environmental consequences and destroys the medicines by high temperature incineration.

### 2.13 SDG 16: Peace and Justice Strong Institutions

License plate theft is on the rise in Australia. In Victoria alone, the number of vehicle registration plates stolen has risen from 16,075 in 2016 to 21,000 in 2017, a 40% increase (CCPU, 2018). Offenders use the stolen plates to mislead authorities when committing petrol theft, drug trafficking, burglary, robberies, ram raids, and toll evasion. To combat this, State Police departments in Australia regularly conduct 'Operation Safe Plate Day', in which mo-



torists are provided with tamper-resistant one-way screws to replace the regular screws on their number plates. Once these security fasteners are installed over the vehicle registration plate and tightened, they can only be removed at the local Police station or through authorized mechanics.

Midnight Basketball Australia as a national 'harm prevention' charity whose social-inclusion programme combines team sports, education and civic participation to develop skills, confidence and work readiness. Through high-energy, fun and engaging community-based activities, 'at risk' youth aged between 12 to 18 are steered away from the cycle of disadvantage and coached to identify and embrace positive opportunities and pathways in their lives and in their community. Volunteers engage the youth in free tournaments on Friday or Saturday nights for 8 weeks, which includes a hot nutritious dinner, compulsory life skills workshops, basketball games from 7:30 pm until midnight, and a bus ride home. Midnight Basketball's motto is 'No Workshop, No Jump shot'. Workshop topics include nutrition, wellbeing; substance misuse, self-harm; anger management; decision making; self-esteem; and financial literacy. Since its launch in 2007, Midnight Basketball Australia has involved over 80,000 teenagers in 13 cities in 5 states. This initiative is based on the Midnight Basketball model in the USA from the late 1980's, where it has been successful in keeping youth out of trouble and off the streets and giving them a positive outlet away from drugs and crime (Hartmann & Depro, 2006).

### 2.14 SDG 17: Partnerships to achieve the Goal

The C40 Cities Climate Leadership Group is a partnership amongst 90 large and engaged cities worldwide, where 650 million people live and collectively contribute to one quarter of the global economy. C40 cities commit themselves to bold climate-related actions locally amongst their citizens so as to have meaningful positive results in the global climate. Twelve cities in Latin America and 3 in Oceania are amongst the C40 cities. Acknowledging that cities use up over two-thirds of the world's energy and generate 70% of global CO2 emissions, C40 governments agree to facilitate the reduction of carbon emissions and optimizing energy consumption in their cities.

The Australian Government's Council on Australian Latin American Relations is supporting the LeNS South-to-South project, wherein Design-for-Sustainability (DfS) educators from Australian and Latin American universities belonging to the Learning-Network-in-Sustainability (LeNS) will jumpstart collaborative relationships in DfS education and research and share expertise and experiences in a two-way knowledge exchange.

## 3. DISCUSSION & CONCLUSION

The 60 case studies in this collection show strong evidence that Australia and Latin America are hotbeds of sustainable innovations that have strong potential to address the various targets and indicators of the UN Sustainable Development Goals within our regional contexts.

Some solutions show direct transferability to other countries, almost like plug-and-play. Typically, within the same cultural region, the innovation might require little modification to fit, and sometimes transplanting the idea from developing world to developed world (or vice versa) could require more tweaking and deliberate adaptation to be acceptable to the new context. At the same time history shows that many excellent solutions have been transplanted into completely different cultural scenarios without much change in form, perhaps due to the universal applicability of the innovation. For instance, AirBnB, Uber, carsharing, bike-sharing and social media platforms exist in virtually the same form anywhere in the world.

Curitiba's Bus Rapid Transit has become the model for many modern BRT systems not only in Latin America but in other regions: TransJakarta, which is Asia's first BRT and currently the world's longest, is a case in point. Bogotá's long-running Ciclovía-Recreativa has inspired other cities worldwide to hold special weekend events that promote 'fun runs', walkathons, cycling, dancing or 'street parties' in car-free streets. Versions of Medellín's Metrocable gondola lift can now be seen in Caracas, La Paz, Mexico City, and Bogotá. The 'Clean Up Australia' movement has scaled up to 130 countries and became 'Clean Up the World'.

Showcasing innovations can help inspire design thinkers, changemakers, and policymakers with rather uncommon approaches that have worked well elsewhere. Doing so can provide a meaningful starting point, or perhaps an 'emulation point', for deeper rethinking and for local recontextualization.

Albert Einstein is often quoted as having said that 'we cannot solve our problems with the same thinking we used when we created them'. Indeed, solving the grand challenges of the UN Sustainable Development Goals demands radical thinking to generate revolutionary ideas, rather than evolutionary thinking which would only yield incremental ideas. Innovators are often challenged to think outside-the-box in order to arrive at a completely novel idea, and this often difficult for the uninitiated. Naysayers insisting that 'there's nothing new under the sun' discourages one from thinking harder. Looking elsewhere, especially by learning from the imaginativeness of cultures different from our own, can be very stimulating, helping reboot our thinking and stirring us to reframe our problem using a new set of lenses.

Behavioural and cultural change are often required to implement radical breakthrough solutions in the community, and innovators can often avoid resistance and facilitate acceptance by codesigning the solutions with stakeholders and involving them intensively from the very start. But there are always exceptions to rules. Jaime Lerner wasn't consultative when he first pedestrianized Curitiba's main street almost overnight. Instead he just did it.

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