Streetsmarts

A teacher's guide on urban challenges and resilient cities

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Introduction to guide's theme

Europe is a highly urbanised continent. What happens in our cities is crucial to the sustainable development agenda and the betterment of society. If the most pressing challenges of our cities are to be solved, it will not be done by a few experts, but rather by communities and citizens who together are capable of thinking creatively and coming up with new and better solutions. Imaginative and innovative projects are already underway — citizen-owned renewable energy systems, bike- and car-sharing, urban farming, citizen-run social services. People are taking charge of their communities in cities around the world, including here in Europe. But so far, these initiatives lack the strategic coherence, economic incentives and public confidence to grow and mature into a real transition. Public pressure on decision makers, voluntary efforts and bottom-up initiatives are of key importance, and this is where education plays an important role. In order to shift to a more sustainable and inclusive urban development, young people need to understand the urgency of today's challenges and what can be done to address them.

How to use this handbook

Our objectives in this guide are to help you outline for your students Europe's main urban challenges, and to engage them in a quest for solutions. The guide will explore the following topics:

- Opening session: Growing cities, gnawing challenges
- Challenge #1: Ensuring a sustainable food supply
- Challenge #2: Securing clean and efficient sources of energy
- Challenge #3: Developing green transport systems
- Challenge #4: Addressing the consequences of an ageing population
- Challenge #5: Adapting to climate change
- Challenge #6: Utilizing vacant urban space
- Challenge #7: Dealing with social exclusion and inequality
- Final session: Creative workshop - The Two Islands

The guide contains a set of multidisciplinary, fun classroom activities with instructions, ideas for student-led initiatives, homework assignments and a bibliography of resources for further investigation. These tasks emphasise group work and cooperative learning. The activities can be taught independently in nine traditional lectures (8 x 45 min., 1x 135 min.). Alternatively, they can be covered in a single interactive workshop that builds on the content and activities of the opening and final sessions, while utilising knowledge and case studies from the challenges (240 min.). Whichever option suits best, we suggest that you use this curriculum in the context of social studies classes, as urban development and social innovation is a broad topic that covers many disciplines. The topic presents an ideal opportunity for team teaching: we encourage head teachers, English teachers, art teachers and science teachers to work together in the planning and implementation of the activities.

Opening session: Growing cities, gnawing challenges

Not only is the world's population growing, but a greater percentage of people now lives in urban areas than ever before: the current estimate is 54 percent, but this is expected to be more than 70 percent by 2050. While the rates of population growth and urbanisation are highest in Asia and Africa, 75 percent of Europeans already live in urban areas. Also, as Europeans have adopted urban lifestyles and use city-provided cultural, education and health services, the line between urban and rural environments is quickly blurring.

Cities are, of course, Europe's cultural capitals and economic engines, but they depend heavily on resources of outside regions — from all over the world, in fact — to meet demand for consumer goods; for resources like energy, water, food; and to accommodate waste and emissions. This dynamic sharpens existing urban problems, while also presenting new challenges. These problems and challenges require either new and innovative solutions, or the introduction of various "urban resilience" strategies to prevent or minimise the consequences of anticipated large-scale or long-term crises. Fortunately, cities are also hothouses of social innovation and ideas on how to solve complex problems.

"Urban resilience" is the capacity of individuals, communities, institutions, businesses and systems within a city to survive, adapt and grow no matter what kinds of chronic stresses and acute shocks they experience. *Chronic stresses* weaken the fabric of a city on a daily or cyclical basis. Examples include: high unemployment, overburdened or inefficient public transportation systems, endemic violence, and long-term food and water shortages. *Acute shocks*, by contrast, are sudden, sharp events that threaten a city. Examples include earthquakes, extreme weather, floods, disease outbreaks, and terrorist attacks.

Cities can improve their resilience by being:

- **Reflective** (using past experience to inform future decisions)
- **Resourceful** (recognising alternative ways to use resources)
- **Inclusive** (prioritising broad consultation to promote shared ownership in decision making)
- **Integrated** (bringing together a range of distinct systems and institutions)
- **Robust** (having well-conceived, constructed and managed systems)
- **Redundant** (allocating spare capacity purposely created to accommodate disruption)
- **Flexible** (willing and able to adopt alternative strategies in response to changing circumstances)

Activity: **Idea Poker**
Time: 15 minutes

Rules and instructions:

- Prepare with a stack of magazines (ask your students to bring some in advance) or a few hundred images cut out from magazines and newspapers and printed from the Internet.
- Split your students into groups of 6-8 and provide each group A4 sheets of paper, scissors, glue and a stack of images (at least 100 per group or 15 per person).
- Each student should choose one or more of pictures, representing an urban challenge for the 21st century that he/she has in mind.
- Prepare “challenge cards” for this topic: Every student should glue or tape the chosen images to an A4 sheet, give it a title and write a short explanation under the pictures.
- Everyone hands over this challenge card to the student sitting on his/her right side.
- With the challenge in mind, each student has to prepare a “solution card” as a response to the “challenge card” that has been received. The solution card is created in a similar way: one or more images stuck on an A4 sheet with a short, written description of the proposed solution.
- Ask a few students to share the challenge and solution with the class.

Example: Chris prepared a challenge card containing images of congestion and obesity, stating that "car use leads to traffic jams and unhealthy lifestyles" then Liza makes a solution card featuring bicycles, a train or people jogging in the park stating that “active lifestyles and public transport reduce traffic jams and keep people healthy”.
Collect the card pairs and hang them in the classroom wall. You can easily refer to them in the upcoming lectures. Discuss how different challenges and solutions might tend to overlap!

Photo credit: Attila Katona

The promise of social innovation

Just as demographic, environmental and economic threats grow more acute, society's traditional means of coping – through governments and other public bodies – are less equipped. Especially in the wake of the financial crisis that started in 2008, public agencies simply don't have the money to deal with the growing burdens of the welfare system. Many experts argue that a new approach is needed -- one based on local control, active citizenship and open governance.

The movement toward novel, grassroots solutions to urban problems is often called "social innovation". It has to do with citizens working together on local initiatives and inventing new and more sustainable solutions to solve day-to-day problems. Digital communications, particular social media, contributes to such activities, making them easier to organise and at a larger scale and rapid pace than before. Some famous examples of social innovation include crowdfunding platforms (i.e. raising investment capital from social networks) and collaborative mapping (i.e. people with common interests making maps together online). But social innovation includes all sorts of initiatives that involve people working together for the good of the community. It can be a network of widowed women who let out vacant rooms to unemployed young people in exchange for household help. It can mean a micro-credit bank that allows people with no collateral to get small loans to set up businesses. It can mean organising a community garden that produces local food and adds life and beauty to an abandoned neighbourhood lot. All these initiatives address common challenges. At the same time, they build connections between people, which creates enduring social benefits. People who know and trust each other are more likely to come to each others' aid in times of crisis. That's a key ingredient in urban resilience.

Let's talk!
What sorts of social innovation activities take place in your own city or community? What public challenges do they address? Can these problems be solved by City Hall? What would be the pros and cons of addressing them instead through direct citizen initiative?

Follow-up
Ask your students to write a letter to their future selves 10-15 years down the road. Ask the students to reflect on their long-term goals, what they think they'll be doing and how the world and their city look like at that time. Ask them to seal the letters and wait five years before opening again to see how their goals have changed.

Challenge #1: Ensuring a sustainable food supply

Explain to the students that human populations have engaged in agriculture — the use of land for plant and animal production — for more than 10,000 years, and have been enormously successful in doing so. The use of fertilisers, irrigation, mechanisation and genetic engineering have served to increase harvests and support unprecedented levels of human population. But the true environmental costs of these techniques are becoming clearer, while increased urbanisation is raising new questions about future "food security", which the World Health

Organization defined nearly 20 years ago as: “when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life.”

Let’s talk!

Ask your students to picture their local supermarket and the variety of fresh and packaged food products on the shelves. Do they ever ask themselves: How does it all get here?

Explain that cities, almost by definition, are centres of food *consumption* — not food *production*. This means that the many varieties of food we eat are brought to our cities and markets through extremely complex supply chains. Sometimes the food we buy is grown and harvested close to home (i.e. local food), but much of our food products originate from halfway around the world and all points in between — e.g. cheese from France, oranges from Greece, bananas from Ecuador, jasmine rice from Thailand, or tuna from Australia.

Ask the students where coffee comes from? (Answer: Brazil and Colombia are the biggest coffee exporters, but some 30 countries in the world, all in the tropics, produce coffee.)

Explain that Europe is a relatively wealthy part of the world, which is why its people enjoy food products from around the world—and, for the most part, at all times of the year. Contrast this with poorer societies that rely heavily on local food production. They not only have a necessarily limited range of food available, but are highly vulnerable to any set of conditions that jeopardises local food production and procurement. Ask the students to suggest what some of these conditions might be? (Some examples: droughts and other extreme weather that can destroy crops, political crises that force people from their land, or food price increases).

Propose that there are two important things to consider when looking at food supply chains in a global context: These chains can be both *unsustainable* and *unjust*.

How can food be produced and supplied to cities in ways that are more sustainable and more humane? Ask students to think of a few other products that can be found in their local supermarket. Try to imagine where they come from and how they get there. What are all the processes involved? Does everyone along the product supply chain benefit equally? Are their more sustainable, humane alternatives to these specific products?

Give students an example in your country of an unsustainable practice in the food industry. Or give this European one: The sole fisheries in the Irish Sea, the west English Channel, and other locations have become overfished to the point of virtual collapse. Gathering as many fish as possible may seem like a profitable practice, but overfishing has serious long term consequences: the depletion of fisheries becomes faster than their rate of recovery, therefore the fish population is no longer able to sustain itself through natural reproduction. The results not only affect the balance of life in the oceans, but also the social and economic well-being of the coastal communities who depend on fish for their way of life. This phenomenon, when a shared resource is overused, is called the “Tragedy of the Commons”.

Activity: **Go Fish! simulation game**

This game, which takes about 15 minutes, is a guided inquiry that encourages students to come up with a solution for their "survival". The only way a fishing community can fish indefinitely is to harvest sustainably. Even though the goal of the fishing game is to gather the maximum number of fish (or "profit"), represented by Goldfish crackers, if someone in one of the groups starts overfishing, it almost always results in a crash of the fish population and the ultimate demise of all the players.

Details and rules of the game are available at:
http://earthwatch.org/Portals/0/Downloads/Education/Lesson-Plans/Go_Fish.pdf

Follow-up

At the individual level, there are a number of things people can do to help "green" the food supply chain. Ask students to try to implement some of these practices for a one-week period (if they aren't already):

- **Buy fruits and vegetables that are local and in season.** Locally grown produce typically travels a much shorter distance "from farm to fork" than produce that comes from abroad (of course, the size of the country a person lives in will always be a factor). Also, produce that is purchased out of its growing season is typically treated with fertilisers and chemicals that are both harmful to the environment and physical health.
- **Buy food that is grown organically.** Organic foods are grown without the use of chemical fertilisers, pesticides or other artificial chemicals. Food sold in the local supermarket that is grown organically should be labelled as such. While organic products are usually more expensive, they are generally healthier and better tasting than non-organic food.
- **Avoid buying products with excessive packaging.** Packaging not only accounts for a significant percentage of food costs, but generates huge amounts of waste: In the European Union, some some 89 million tonnes of food is wasted every year. That's 180 kg per person! At the very least, try to recycle as much packaging waste as you can.
- **Support local, independent retailers and farmers' markets.** While giant, multinational food wholesalers offer convenience, year-round variety and lower prices, they operate on models that threaten long-term environmental sustainability and drive local producers and retailers out of business.
- **Eat less meat.** Do students realize that the global livestock industry produces more greenhouse gas emissions than all cars, planes, trains and ships combined? Skyrocketing levels of meat consumption in developed and developing countries is accelerating the pace of climate change.
- **Compost your vegetable waste.**
- **Cook more often at home from fresh ingredients.**
- **Shop carefully to avoid excessive food waste.**

Ask your students to try this experiment, and then report on it. In one page, they should describe which of these practices their families tried and which, if any, they couldn't—or didn't want to—try. What were the advantages to eating more sustainably, beyond doing good for the

planet? What were the disadvantages? Were there barriers to adopting any of these habits in the first place? Which of these practices can they take up for a longer period of time?

CASE STUDY: **Urban agriculture in Havana**

"Necessity is the mother of invention," or so says the old English proverb. When Cuba found itself abruptly cut off from trade with the Soviet bloc in 1989, the country entered into an economic crisis of unprecedented severity. Already side-lined from international trade due to US embargoes, Cuba became, almost overnight, a country detached from the rest of the world. Along with the evaporation of food imports, Cuba lost access to the animal feed, fertilisers and fuel that had sustained the island's agricultural efforts. Presented with a near collapse of its food provisioning system, the Cuban government responded with an overhaul of agriculture on the island, prioritising organic farming methods, the production of useful edible crops and the use of peasant labour.

In urban areas, guerrilla gardening initiatives blossomed into new state-supported urban farming programmes, with widespread voluntary participation. These farming efforts have produced what some have described as "the world's largest working model of semi-sustainable agriculture." Havana has become an exemplary model of this new self-provisioning, a precedent that demonstrates both the opportunities and obstacles for the transference of urban agriculture to other regions.

A city of more than 2 million people, Havana provides an example of a systematic approach to rethinking urban landscapes for more productive means: food production infrastructure has been woven into the city fabric, with interventions that range in size from backyard gardens to large peri-urban farms. A combination of top-down state support and ground-up citizen participation has proven wildly successful; economist Sinan Koont estimates that "more than 35,000 hectares of land are being used in urban agriculture in Havana.

The urban agriculture practised in Havana provides an important model for any city transitioning towards food independence. As climate change intensifies and energy, land and water reserves diminish, many see the value in a return to local economies and the development of more resilient food systems. Cuba's model — affordable, accessible, comprehensive, and de facto organic — could be particularly instructive for other nations seeking improved food security.

Source: http://www.architectural-review.com/view/cubas-urban-farming-revolution-how-to-create-self-sufficient-cities/8660204.article

CASE STUDY: **Prinzessinnengarten: urban gardening and cultural cross-pollination**
Prinzessinnengarten is one of Berlin's first commercial community gardens, and from the many press accounts of it, is likely its most famous. The enterprise started in 2009, the brainchild of a community activists who took their inspiration from the urban agriculture boom in Cuba in the early 1990s (see previous case study).

UK native Robert Shaw, together with Marco Clausen, worked out an arrangement in 2009 with the City of Berlin to rent a patch of land—neglected for decades and about the size of a football pitch—with the intention of turning it into an urban vegetable garden. With the help of friends, neighbours and various outsiders, Prinzessinnengarten took root in the city's Kreutzberg district and quickly bloomed into a self-sustaining, multi-purpose urban green space that now grows more than 500 plant species.

Open to anybody with an enthusiasm for plant cultivation, the organic garden is completely mobile—meaning that nothing is planted in the ground itself, but rather in raised beds made from stacked crates or in rice sacks. The ability to relocate the garden provides a safeguard should the city decide at some point to sell the land to the highest bidder—a fate that has been forestalled for the time being, but looms nonetheless as a constant threat for this and all other small-scale enterprises competing for highly contested urban real estate.

Prinzessinnengarten operates as a business, and has to cover its own expenses, which include rent, staff costs and infrastructure investments. It manages to do so by operating a bar and restaurant that uses products grown on-site and by offering a range of gardening and cultivation courses. It also sells its produce, although these proceeds account for just 10 percent of the garden's revenues.

The most valuable quality of the space, though much harder to quantify in financial terms, is the unique social component that it brings to the neighbourhood. The garden brings together numerous people from diverse backgrounds and provides a natural space for public interaction. The space provides peace and quiet—a sanctuary from the persistent buzz and frenetic pace of big city life.

"In this kind of pioneering use of land," says Clausen, "what we're really out to do is to show what is possible in a specific place."

Source: http://prinzessinnengarten.net/about/

Challenge #2: Securing clean and efficient sources of energy

Energy figures into almost every human activity: it heats our homes, fuels our cars, ploughs our soil and powers our machinery. Harnessing the world's energy supply has brought standards of

living to previously unimaginable heights, and we are so accustomed to energy use that one can scarcely imagine surviving a time before it existed. So what is there to worry about?
First, we need to understand where energy comes from. Energy sources can be placed into two categories: renewable and nonrenewable.

- **Renewable**—energy sources that are replaced by natural processes at a rate comparable to their use
- **Nonrenewable**—energy sources that are limited and can eventually run out; these sources of energy cannot be replaced on a timespan of human significance

Activity: **Testing students' energy knowledge**
Have the students list as many energy sources as they can and ask them to fit these into the two categories. Write this list on the blackboard. For scientists and energy professionals, these are some of the main energy categories: coal, natural gas, oil, nuclear, biomass, solar, wave or tidal, wind, hydropower (rivers and streams) and geothermal. Students may come up with variations on this list that are also acceptable: plough animals, batteries, charcoal, gasoline, propane, humans, water, wood.

Ask students to guess how much of the energy we use in Europe (or in their own country) comes from renewable energy sources. Here are some actual statistics: In Europe, energy is mainly obtained by burning fossil fuels, which account for 56 percent of the total energy production (compared to 82.5 percent in the US and 91 percent in China). Nuclear energy accounts for 35 percent of Europe's primary energy, while renewable energy sources provide 9 percent.

You may wish to provide students with some of the following information: The energy stored in fossil fuels comes from solar energy that was captured in plants millions of years ago. Fossil fuels have driven global economic development over the past century. Extraordinarily efficient in terms of energy conversion, fossil fuels are, however, finite resources — which means they will run out some time. And resources, as they become scarce, also become more expensive.
Of more immediate concern is that the extraction and burning of fossil fuels causes permanent harm to the environment. Emissions into the atmosphere from the burning of fossil fuels could lead to potentially catastrophic changes in Earth's climate. In other words, we are in desperate need of alternative sources of energy.

Nuclear power is a more recent addition to the energy mix, but this energy source brings several problems of its own. A nuclear accident (e.g. a core meltdown and/or reactor leak) at a power facility can spread lethal doses of radiation over a wide area. The two worst nuclear accidents ever were in Chernobyl, Ukraine (1986) and Fukushima, Japan (2011). In addition to plant safety concerns, there is the other serious problem of how and where to store nuclear waste. Even spent fuel rods stored underground will remain dangerously radioactive for many years, ensuring that future generations will be forced to deal with the unpleasant consequences. The need for robust safety measures and disposal procedures makes nuclear energy politically controversial and expensive.

Renewable energy is energy generated from natural resources such as sunlight, wind, rain, tides and geothermal heat. A major advantage of these sources is that they are inexhaustible and, compared to fossil fuels, are generally less polluting and can be obtained virtually anywhere in the world. Using new forms of technology to harness and convert these resources into usable forms of energy, it might one day be possible to power our cities from 100 percent renewable sources. But this will require tremendous amounts of innovation, commitment and cooperation.

For the time being, we are faced with two separate challenges. The first involves large-scale, long-term planning and budgeting for converting fossil-powered infrastructure to renewable energy infrastructure. The second challenge is to live our daily lives in ways that use existing energy infrastructure as efficiently as possible.

Activity: **Examining personal energy use**

Ask students to list all the ways they use energy in their daily lives. You can either do this as a class, in small groups, or with each student writing out his or her own list. Make the lists as comprehensive as possible. You should probably restrict the list to what the students use personally (e.g., for their smartphone, travelling to and from school, making popcorn, etc.). Now tell them to think of ways to save energy for each item. Solutions include: turning electronic things off when not in use, turning off household lighting and using sunlight, replacing incandescent lightbulbs with LEDs or fluorescent ones, unplugging appliances, setting computers to sleep or hibernate, purchasing energy-efficient technology, turning the thermostat down, using household appliances more efficiently, lowering the brightness of computer monitors or TV screens, measuring use with smartphone apps, etc. A full list of tips and techniques on how to reduce energy consumption is available here: http://www.nrdc.org/air/energy/genergy.asp

Cities can do a lot to influence the energy choice of their citizens. Many cities and towns have energy-efficiency programmes that, for example, help families with the initial investment in renewable technologies (e.g. solar panels), provide subsidies for home insulation or encourage renewable use with two-way energy grids that can both supply electricity and buy it from households that produce their own power.

Activity: **Looking into the future**

Now tell the class to take a mental trip into the future: In 2050, their city might run entirely on renewables. Ask students to think of some inventions that have made this possible. How are their houses and schools heated and lighted? What do people use for transportation? Have students write down their ideas or draw pictures and ask a few of them to introduce their ideas.

Follow-up

- Science classes can study the various processes power plants use to generate electricity.

- Students can build solar box cookers, solar water heaters, small wind machines in technology/science class or a photovoltaic cell in chemistry class (using strawberries and blueberries as materials!).
- Visit an electricity-generating plant.
- Have students write articles for the school newspaper about renewable energy sources, and how they can be (or already are) used by the school.
- Electric appliances have a label or decal that lists how much power they require (usually in watts or amps). Have students go through their houses and record all electric appliance power requirements. Then help the students rank their uses of power from their largest use of electricity to their smallest (e.g., refrigerators use more electricity than televisions). How much power would they need to run all the appliances in their houses simultaneously for an hour? How much would it cost to do this?
- Ask your students to pay attention to their everyday energy use and try to minimise it. They can write about their findings in a report.
- With the assistance of an expert or teacher with measurement tools, have children look for energy leaks in their school and report it to the maintenance crew

CASE STUDY: **Frankfurt 2050 zero carbon masterplan**

When people hear “Frankfurt” they think of the stock exchange, the airport, the Euro, Paul’s Church, Goethe, sausages or the skyline. Frankfurt am Main is a dynamic mixture, combining history and culture in a modern international cityscape. Located in the center of Germany, Frankfurt is the smallest metropolis in the world, with 700,000 inhabitants and hundreds of thousands of commuters. And although its glass and steel downtown appears very corporate, the city aspires to become ever more green and low-carbon.

For decades, Frankfurt has been working to become climate-friendly and make smart use of new energy technologies. The city cofounded the Climate Alliance of European Cities and established one of the first municipal energy and climate protection agencies in the ‘80s. Frankfurt updates its energy and carbon footprint annually, with the goal eliminating carbon emissions by 2050. Already, emissions have been cut by 15 percent since 1990. This despite the economy has growing by more than 50 percent and office floor area by more than 80 percent.

Frankfurt was the first city to promote electricity savings by giving cash awards to residents. Children are involved, as well: Since 2002, primary schools of Frankfurt have run energy workshops and games. In the energy-saving game, schoolchildren explore their school buildings with measuring devices and, with their teachers, look for energy leaks think of ways to reduce individual consumption. The project does more than impart information – in 2008, 50 -participating schools reduced their CO2 emissions by 1,400 tonnes!
The city supports programmes that bring nineteenth-century buildings in line with modern energy-efficiency standards, it is building an extensive district heating system and it has its

own green architecture award. City programmes support cycling, electromobility and the recovery of waste heat from the sewage system. The city organizes popular Climate Tours to look “behind the scenes” of Frankfurt’s climate protection players. As a local energy expert said, “The transition to a low-carbon economy starts here and now, in cities.”

Source: http://www.frankfurt-greencity.de/en/environment-frankfurt

CASE STUDY: **EVA Lanxmeer - a renewable energy community**

The EVA-Lanxmeer is a renewable energy neighbourhood and grassroots living project that began in the early 1990s near Utrecht, Netherlands. Situated by the main rail station of the town of Culemborg, it was developed with the goal of being environmentally-conscious and as self-sufficient and sustainable as possible. As of 2015, about 700 people lived in the Lanxmeer area, which includes approximately 270 houses, as well as offices, workshops, permaculture gardens, schools and a city farm. From the beginning, residents played a prominent role in the neighbourhood’s development: In close cooperation with the local government, they plan and manage public spaces and make basic decisions about current and future development. The area has no fences, allowing residents to experience the whole district as their own garden. Lanxmeer is entirely car free, allowing children to play everywhere safely.

The district's energy concept is based on self-sufficiency. The starting point was a passive solar energy design for homes, as well as very good insulation and the capturing waste heat through heat exchange ventilation. To ensure electricity on demand, the neighbourhood generates power on-site from renewable sources: primarily from solar technology, but also from wind and a waste treatment plant. The production of biogas from waste flows has two positive effects: not only does it provide on-demand electricity, but it frees the neighborhood from having to hook up to (and pay for) the public sewage system. Residents also have control over their heating, having purchased the small district heating company, Thermo Bello, when it went up for sale in 2006. In this way, the neighbourhood saves on costs and can operate it on a sustainable basis. Thermo Bello’s heating is provided through low-temperature hydronic pipes in household walls. Most of the energy to run the system comes from the sun, including photovoltaic electricity to run pumps and direct solar heating for hot water. The system provides both space heating and hot water for sinks and showers.

EVA-Lanxmeer’s environmental approach not only saves a lot of money, it encourages social engagement and community spirit. It also helps protect the surrounding natural environment, including local groundwater, and thereby promotes biodiversity and resilience of natural ecosystems. Locals call it "the park of the 21st century".

Source: http://www.energy-cities.eu/IMG/pdf/urban_decentralization_evalanxmeer.pdf

Video: https://www.youtube.com/watch?v=FPib79RbQ4o

Challenge #3: Developing green transport systems

Explain that in cities, we rely on various means of transport to get from one place to another. Transport is also needed to move food and other goods to stores (more in section 2 on sustainable food supply). Although transport has evolved by leaps and bounds technologically, the last several decades have seen an overreliance on single-occupancy vehicles.

Explain that the high volume of cars on the roads results in severe environmental and health impacts and that cars are uneconomical—both from an individual and a societal perspective. As cities grow and become increasingly important centres of activity, the demand for efficient, versatile transport grows. Compared to single-occupancy cars, alternatives such as public transport, shared mobility (e.g. car pooling and car sharing) and bicycling are more efficient, less polluting, less expensive and often faster.

Explain that a key problem in larger cities in Europe is traffic congestion, which occurs when roads carry more vehicles than they're designed for. In practice, this means that morning and evening commutes take longer than they should. Fact: In Europe's most congested city, Brussels, the average person loses 83 hours a year due to congestion, or more than half an hour every workday.

Let's talk!
Have an open discussion about the advantages and disadvantages of private automobiles. How much of your urban infrastructure is dedicated to prioritising private automobiles? What are the impacts of 'car culture' on society? Would the introduction of electric vehicles solve all car-related problems?

Along with the enormous uptake of space for roads and parking, cars:

- are one of the biggest sources of local air pollution;
- are major contributors to greenhouse gas and climate change;
- impose high social costs due to road crashes;
- created air and noise pollution,
- add to earth vibration, which damages buildings (one reason motor traffic is often restricted in historic urban centres); and
- encourage sedentary lifestyles.

Activity: **Family role play about car use**
Assign your students into groups of four. In each group, two students take on the role of parents (actual or imaginary) who use a car as their primary mode of transport. The other two or three

students in each group will represent themselves (as children) trying to persuade their “family” to reduce car use in their everyday life. Ask all groups to discuss, proposing alternatives to cars and debating (parents vs. kids) for 5-7 minutes on the the relative merits of cars vs. alternative modes. Afterwards, have a full class discussion that sums up the arguments that emerged in the groups and reflect on them if needed.

Follow-up

- Organise a bicycle trouble-shooting tour in your town. Ask the students to observe and describe any sort of changes to the roads, signs, traffic lights or other infrastructure that would make cycling safer and more practical. Summarise their suggestions in a letter and send it to the relevant authorities at City Hall. Perhaps you can even organise a meeting with them where the students can present your recommendations in person.
- Organise an urban bicycle tour in gym class. Ask for the support of a local cycling association to present rules and advice on urban cycling, and provide bicycle inspections to make sure students’ bikes meet relevant legal and mechanical standards. If possible, have the cycling expert guide a tour around the local neighbourhood and illustrate some of the previously explained rules and advice.
- Appoint senior students to act as mobility ambassadors to promote sustainable transport modes among their peers to set a good example and create a snowball effect. For example, they can help organising a “walking bus” (see relevant entry in Wikipedia) for younger students or explain the benefits of sustainable mobility during the European Mobility Week in all classes.

CASE STUDY: **Riding for free in Tallinn**

On January 1, 2013, Tallinn, Estonia became the first European capital city to extend free public transport to all of its residents. The motivation was a careful consideration of budgetary implications balanced against social, environmental and fiscal benefits. By introducing free transport, the city stood to incur an additional cost of EUR 12 million, which was judged to be a reasonable price to pay when considered against the benefits of the scheme.

During the first quarter of 2013, traffic congestion in the centre of Tallinn was down 15 percent compared to the end of 2012. Since the start of the scheme, public transport use has increased by 12.6 percent, and car use throughout the Tallinn area has been reduced by 9 percent. The expected reduction in carbon dioxide emissions is 45,000 tonnes annually, with additional benefits in terms of noise abatement.

There have also been some fiscal benefits. About 10,000 people have registered as Tallinn residents since it became known that free public transport would be introduced, according to Allan Alakula, head of the Tallinn EU Office. There are estimated to be an additional 30,000 unregistered residents in the city, and the free transport scheme could encourage registration.

Every additional 1,000 residents bring the city about EUR 1 million in additional annual tax revenues, Alakula claims.

While Tallinn's free-fare scheme has yet to inspire the massive modal shifts originally hoped for, the numbers two-and-a-half years in have been sufficiently encouraging for it to continue over the short term. At the very least, Tallinn's example can provide valuable lessons for other cities seeking new public transport solutions.

Sources: http://www.tide-innovation.eu/en/Blog/TALLINN-FREE-PUBLIC-TRANSPORT-CASE-STUDY/

CASE STUDY: **Bike sharing in Paris and beyond**

Bike sharing is a concept that is spreading like wildfire across the globe — and with good reason: it's environmentally friendly, relatively cheap to implement, requires minimal infrastructure, promotes healthy lifestyle, and increases accessibility to public transport services. The principle of bike sharing is simple: bicycles are used by various members of a community — locals, commuters and tourists — on an as-needed basis, without users having to shoulder the costs and responsibilities of bike ownership.

Nonetheless, it took more than 40 years for this seemingly simple idea to take off. The concept emerged in 1965, when Amsterdam resident Luud Schimmelpennink deployed 50 white bicycles around the city, designating them for free use. But in a matter days, all of the bicycles were either stolen, vandalised or tossed into the canal.

The basic problem was that there was no way to track users and hold them responsible for lost or damaged bikes. This changed in the 1990s with the development of automated check-out systems accessed with bank cards. This allowed operators to register users, and hold collateral on rented bicycles.

Flash forward to 2001, when Paris's environmentally friendly new mayor Bertrand Delanoë created 271 kilometres of bike lanes. As few people used the lanes, the city realised that the main deterrent was lack of bicycle parking at both ends of a journey: most apartments were too small to store a bicycle, and people did not feel it was safe to leave their bikes on the street.
Utilising the new bank-card checkout technology, the now-famous Vélib system debuted in Paris in 2007. Launched with a fleet of 7,000 bicycles distributed between 750 automated stations, Vélib expanded quickly, clocking an impressive 27.5 million trips in its first year of operation. By 2013, the scheme could boast 256,000 annual subscribers and 96,000 daily riders - that's 8-10 riders per bike every day!

The introduction of smartphone checkout and GPS systems in recent years has allowed bike-sharing schemes to become a mainstream public transport option in cities worldwide. Subscribers pick up bikes from self-service stations and return them free of charge (within a predefined time period) to any other docking station. This makes bike sharing an ideal option for point-to-point "last-mile" trips within any city. Today, an estimated 873 bike-sharing schemes operate in 49 countries in almost every region of the world. The countries with the most systems in 2013 were Spain (132), Italy (104) and China (79). The largest system is in Hangzhou, China, with 66,500 bicycles in 2,700 stations, with more than 175,000 bikes planned by 2020.

Source: Attila Katona: Szentendre Bike Share Feasibility Study

Challenge #4: Addressing the consequences of an ageing population

Explain that there are both benefits and challenges from humankind's increased life expectancy. It is a great achievement of modern societies, and Europeans are living longer than ever before. Combined, however, with lower birth rates, the continent's population is ageing. By 2020, it is estimated that approximately one in four Europeans will be 60 years of age or older. This dynamic will have significant social impacts — on the economy, the labour market, social security and health care systems.

Let's talk!

Begin by asking the students to imagine a country in which the average age of the population remains constant, the retirement age is fixed at a certain age (In 2015 in Europe, retirement age was 61-67, depending on the country), and that tax revenue paid into the country's pension fund remains more or less constant from year to year. In this simplified scenario, the government should have little difficulty in making pension payments to citizens that have retired from active employment; and people of working age can pay into the pension with every expectation of receiving pension benefits when they retire.

Now ask them to imagine a country in which the overall population remains the same—but there is a 1 percent drop in the birth rate every single year over a ten-year period, while the rate of overall life expectancy is increasing. One possibility in such a scenario is that there will be a 10 percent increase in the number of people now collecting retirement pensions, but also a 10 percent drop in the number of the tax-paying working population — as those born within the last decade are not yet of working age.

Ask students to consider the kinds of economic and social problems that might result from this significant demographic shift? What sort of policies might be introduced to address the problem?

As people grow older, they have more difficulty getting around. Cities — especially those with ageing populations — should provide transport infrastructure and services so that elderly citizens can remain active participants in society. Making buildings and vehicles more accessible, for example, is important, but maybe not immediately feasible; other social initiatives, however, require only modest contributions of time and interest from concerned citizens and neighbours.

How easy is it for elderly people to get around in your community? If your legs were weaker, and your eyesight and hearing poorer, what obstacles might you face? Do you have any ideas of how to make your community more inclusive and interesting for the elderly?

Ask students to consider another angle: As people live longer, older people might be more capable of working effectively at jobs beyond a given retirement age. Might the retirement age be raised to allow more people remain in the workforce; or is this an unnecessary burden placed on people who have already spent their lives working and paying into the pension system? Or, perhaps, retirement ages should be lowered to make more room in the job market for young people. Or, perhaps, should the country welcome more immigrants in order to bolster the workforce?

While it's easy to see demographic trends as the *causes* of certain problems, it's also necessary to understand that they are just as often the *results* of particular social and economic conditions. If a population is shrinking or ageing because fewer children are being born, this could be for any number of reasons: young people are marrying at a later age or not at all; more women are opting to pursue a career instead of having children; or the costs of raising children are simply too great (food, childcare, health care, lack of parental leave from the workplace, educational costs etc.).

Activity: **The spaghetti-marshmallow tower**
Time: 15 minutes

Break the class up into teams of no more than 4-5 people. Each teams tries to build a free-standing tower as high as possible using spaghetti and marshmallows in 15 minutes time. A limited supply or materials is available for each group (e.g. 50g of spaghetti (uncooked!) and 25g of marshmallows per team) Spaghetti can be broken into smaller pieces. The highest tower at the end of the day will be winner.

The game can be seen as a metaphor for society, with the different materials having different properties and uses, and both playing vital roles in a tower's structure. Discuss what made the tallest tower strong and how this relates to the structure of our society.

Further instructions and tips: http://kats.org/wp-content/uploads/2014/07/Spag_towers_instructions.pdf

Follow-up

1. Discuss with your parents or grandparents how the social and economic challenges of raising of children today might be different from the challenges their parents faced. Do you agree with them?
2. Have the students do some research on population trends in their own country. Their reports should answer the following questions:
    a. What's the size of the working age population today versus the retiree population?
    b. How do these figures compare to 20 years ago?
    c. How do they compare to projected figures 40 years from now – when the students approach retirement age?
    d. Are pensions today enough to live from?
    e. How needs to be done to ensure that today's high-school students have an acceptable standard of living when they retire?

CASE STUDY**: Supportive Housing Project – Living Solidarity**

Living Solidarity is a project that aims to transform the housing *problem* into a housing *opportunity*, one that builds a more cohesive community and a new model of care. The concept relies on cohabitation based on the principles of mutual help and solidarity. It matches people who live in homes that are too large for their needs – primarily older people but others, as well -- with those who lack decent housing.

The formula can apply to a variety of people in a variety of circumstances: the elderly person who needs light support in order to live in her own home and stay self-sufficient, a family that has an extra room in their home, or a woman who has been the victim of domestic violence who seeks a new home and opportunities for a new life. Living Solidarity has achieved significant results, especially in terms of social impact: a small cultural revolution has taken place that has given participants personal redemption and a feeling of confidence and self-determination.

How it works

The basic principle is to build strong interpersonal relationships, a heightened sense of responsibility, a feeling of community solidarity and, through the conscious sharing of the same living space, a strengthening of innovative social-protection systems.

Living Solidarity has set up procedures and tools that are simple and clear to those who would like to replicate the model in their own communities.

As of 2015, the project had activated 121 cohabitations involving 242 families and 257 individuals. Participants have a diversity of backgrounds and situations. Of those providing

housing, the biggest number are elderly people, but there are also single women and families involved. Those seeking housing include single women and single men, young couples, mothers with children, whole families, students and young workers.

History: From Florence to Europe

Living Solidarity is the brainchild of AUSER Volunteers Territorial Florence, a group that sought an innovative way to provide home care to the local senior citizens. In 2009, the first project got underway in as a partnership that included the City of Florence and a network of community groups including the Artemisia Centre Against Violence Against Women. The project won an Italian award for social innovation and thus obtained funds to turn the idea into a business.

After two years of experimentation, AUSER signed an agreement with the municipality to transform Living Solidarity from a project to a continuous service. After a successful run of several years, AUSER decided to disseminate the idea to other communities in Tuscany and around Italy. Between 2013 and 2014 memorandums of understanding were signed with 40 municipalities in the provinces of Pisa, Pistoia, Arezzo and Florence. They resulted in several new projects, all done through partnerships with voluntary associations and various third-sector groups.

As good results have poured in, the project was eventually taken up in Italy's Social Health Regional Integrated Plan (PISSR) for 2012-2015. The concept has won accolades in Europe, including the second prize of the European Awards for Social Innovation in Ageing.

Source: http://www.abitaresolidaleauser.it/

CASE STUDY: **Japan's ageing — and declining — population**

Japan has a population of about 127 million, the tenth largest in the world. But the population is declining. Japan has approximately 27 million elderly people and the largest proportion of over-65s of any country. It also has the smallest proportion of people under the age of 15 (13.6%), which will result in huge difficulties for Japan in the future, as the number of working people will be unable to support the population.

The main reason for the decline in numbers is that Japanese women are not having enough children. There are strong economic reasons for this. Being pregnant in Japan is expensive, as pregnancy is not covered by health insurance. This means that women must pay for their own medical care during pregnancy, including hospital check-ups. Also, health care is only provided free for infants up to the age of three (or five in some areas). Added to this are the huge costs of schooling and university education, and many families decide they can only afford to have one or two children at the most.

There are two particular problems that will result from the declining population. The first is the cost of looking after people as they get older, and the second is the lack of younger workers to fill jobs. As more and more people reach retirement age, the country will have to

find more money for their pensions. This has already meant raising the retirement age and obtaining higher contributions from both employers and employees. Businesses are also finding it difficult to recruit new staff, and this will become even harder in the future. If the jobs cannot be filled, then Japan's productivity will fall, and so will its prosperity.
One obvious way to solve the labour shortage is to encourage more immigration, something to which the Japanese as a nation are generally opposed. Japanese-born people make up 98.5 percent of the population, and it is difficult for foreigners to be accepted or to become Japanese citizens. In comparison, 18 percent of Switzerland's workforce is foreign-born.
There is no doubt that Japan's population is in decline; and although the government is aware of the problem, many feel that it has been slow to react.
Source: http://www.worldmapper.org/articles/WW_Japan_pop.pdf

Challenge #5: Adapting to climate change

Ask for a show of hands to see who has seen a disaster movie in which a modern city is wiped out by a tidal wave or some other disaster wrought by runaway climate change. Explain that in contrast to Hollywood's depictions, climate change has been a process that's normally slower with creeping impacts. But that, even so, there is clear evidence that the world's climate is dramatically changing and this will impact our lives. We've already experience changes to our climate that are likely bellwethers of of the future. Summers today are on average 2 ºC warmer and heavy rainfall events fives times more frequent than 30 years ago. Every year is hotter than the previous and increasingly severe typhoons and hurricanes hit coastal areas around the globe. In the coming decades, humanity can expect increased frequency and intensity of extreme weather. In fact, what's considered extreme weather today—for example a heatwave or thunderstorm—could become a routine by 2050. Sea levels are projected to rise 30-40 cm by this time.

Urban areas are particularly vulnerable to impacts of climate change. The density of people and assets within a relatively small geographic area means higher risks. The replacement of natural vegetation with artificial surfaces and buildings creates unique microclimates with different temperatures, moisture levels, wind directions and rainfall patterns. Cities have limited open space to absorb runoff, which makes them especially vulnerable to flooding. Vast expanses of pavement and other artificial surfaces trap heat and make cities hotter during summer even at night. All this is amplified by the changing climate, which is intertwined with other socio-economic changes. Demographic trends such as urbanisation and increased competition for water are leading to regional water scarcity. An ageing population means more people are vulnerable to heatwaves. Cities must take steps to ensure they are prepared for the future—not

just to avert environmental disasters, but to enhance the quality of life and prosperity of generations to come.

Preparation is always cheaper and more effective than reaction or recovery. Some risks can be mitigated or avoided with small costs through careful planning. A city can't turn away an approaching hurricane, but an early warning system can save a great many lives by giving the population enough time to find shelter. The ability to withstand such shocks is called resilience (as mentioned in the introduction). "Adaptation" is a process of identifying climate risks and opportunities, assessing the options to manage them, and implementing the most sustainable measures to moderate harm or exploit opportunities of climate change. Because the climate will keep changing through the century, along with our responses to it, adaptation should be seen as a journey rather than a destination.

Adaptation can provide compound benefits. For example, increasing and interlinking green spaces in a city absorb flood- and rainwater and reduce the "urban heat island" effect, making the city more resistant to heat waves and more energy efficient. The increased greenery absorbs noise and air pollution, improves water- and energy security and contributes to the physical and mental health of those who live nearby. Green roofs and walls utilise existing infrastructure to improve local micro-climates in a similar way. But even a patch of grass counts! Urban communities can green their neighbourhoods in other small ways, whether through kerbside tree-planting efforts, parks renovation, construction of courtyard gardens or by supporting urban wildlife (putting up birdhouses or bat boxes, for instance).

Activity: **Imagining the future climate**

Imagine your city in 2050. Together with your students, list and note climate change induced vulnerabilities and threats that may affect them. Prepare some examples of shocks or environmental problems that happened in the last five years.

Possible correct answers: Tidal flooding (due to sea level rise), fluvial flooding (from rivers and streams), surface water flooding (from heavy rainfall and overburdening of storm drains), extreme snowfall, long and frequent heat waves or overheating, extreme weather disasters (e.g. windstorms), food or water shortages due to droughts, excessive air pollution, diseases (including food-borne disease or ones carried by animals and insects, or by pests that have appeared only recently because of a change in the local climate), ambient noise.

Have a discussion about how climate change has impacted, or will impact, your own city. What can be done to mitigate or avoid these risks?
Here are some examples of what a city can do to reduce the severity of heat waves and the urban heat island:

- Increase the quantity of greenspace and vegetation.
- Minimise waste heat (e.g. from air conditioning) and vent it above roof level.
- Have a heatwave emergency plan to support the most vulnerable residents (e.g. elderly).
- Minimise the need for cooling (e.g. better insulation).

- Install green roofs, cool roofs (i.e. cover it with pale or reflective material) or green walls.
- Create breeze pathways to enhance natural ventilation.
- Orientate streets and buildings to provide shade in the summer.
- Provide fresh water sources on the streets (e.g. distribute water, operate drinking fountains).

Here are examples of what cities can do to reduce the severity of a drought:

- Enforce sprinkler and hosepipe bans to reduce water consumption.
- Raise awareness and the importance of voluntary constraint through social media.
- Subsidize the purchase of water saving appliances (showerheads, washing machines, etc.).

Activity: **Climate change at school**

Discuss what your school can do to adapt to climate change! Here are some ideas, based on what other schools have done:

- Increase green space in the schoolyard.
- Create a garden.
- Organise a student disaster-relief or first aid volunteer group.
- Install a green roof or wall.
- Build a rain garden.
- Switch to renewables and geothermal heating/cooling.

Follow up

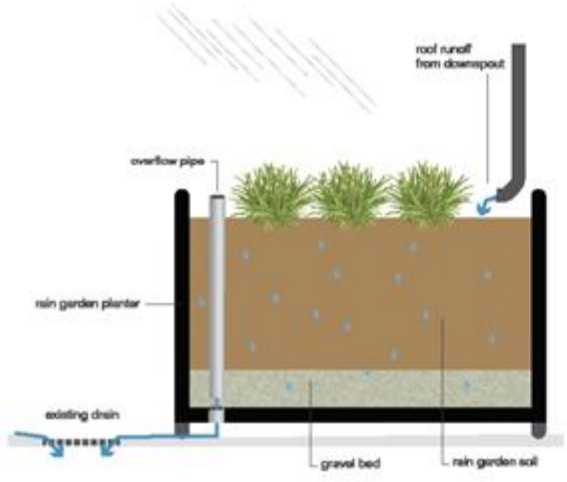
- Initiate discussion about an urban garden or a green space project in your school.
- Encourage students to volunteer for disaster relief organisations in time of need and take up First Aid training
- Have them write an essay about how their city might look like in 2050 and what threats they envision.

CASE STUDY: **The rain gardens of London**

"Either we can grow gills, or we'll need to think of other ways of adapting." So said Mayor Boris Johnson, kicking off an initiative that called London's 8.1 million residents to share climate adaptation ideas to combat persistent flooding, drought and extreme heat waves in the city. London is especially vulnerable to flooding from a variety of sources, particularly flooding from the North Sea, the River Thames and from heavy rainfall. The probability of more frequent and intense rainfalls, and the cumulative impact of paving over gardens puts heavy pressure on the drainage system. Adopted in 2011, London's adaptation strategy proposes 34 initiatives to protect and strengthen the city. Johnson's ambition was to "put the village back into the city" by focusing effort on delivering a cleaner and greener cityscape, increasing tree cover and empowering residents to take action for themselves. At the neighbourhood level, Londoners might develop their own flood plans, for example. Greening

London also makes the city more resilient to flooding and extreme weather events, and can contribute to a healthy mind and body.

A great example of such bottom-up greening is the rain gardens of London. In its simplest form, a rain garden consists of easily drainable soil planted with vegetation that can withstand occasional temporary flooding. Rain gardens mimic natural drainage systems that have been paved over in a city's development. They absorb precipitation and thereby reduce the volume of rainwater running off into drains from streets and buildings, while also treating low level pollution in the absorbed water.



Rain garden planter

Street rain garden

Source: http://raingardens.info/wp-content/uploads/2012/07/UK-Rain-Garden-Guide.pdf

Even schools, groups of local residents and companies are getting on board by building their own rain gardens in London. The John Lewis Rain Garden was opened in 2015 at 171 Victoria Street, Central London as a unique collaboration between local businesses and public sector. The 75 sq m garden was designed to be an attractive living feature enjoyed by everyone, featuring over 30 plant species.
Sir Charlie Mayfield, Chairman of the John Lewis Partnership, said, "The John Lewis Rain Garden is a great innovation in keeping with the values of our partnership, both in helping the environment and making a visual improvement to our local area. Like all partners at our head office, I will be glad to see the rain garden as I arrive at work and be pleased to know it is performing a useful purpose the next time there is a downpour!"

Source: http://www.victoriabid.co.uk/our-news/central-londons-first-rain-garden-unveiled-in-victoria/

CASE STUDY: **"Water war" in Barcelona**

The severe European heatwave in 2003 resulted in a rise in average summer temperatures of 3 to 5°C in most of Europe. It caused up to 70,000 excess deaths in Central and Western Europe, and struck the elderly in Southern European cities especially hard. The daily mortality rate rose by 36% in Barcelona. In 2008, the tanker Sichem Defender arrived at the port of Barcelona, carrying something far more precious than its usual cargo of chemicals: nearly 23 million litres of drinking water, enough for 180,000 people for a day, at a cost of over EUR 1 million euro. It was the first delivery among many as the city struggled to get through an unprecedented drought that brought its drinking water reservoirs to just over 10% of normal capacity. City authorities turned off public fountains and showers and closed swimming pools while schoolchildren were given emergency lesson on how to save water. "As reservoirs across Spain run dry, a 'water war' has broken out, with different regions scrabbling for extra supplies," the Guardian newspaper reported. "The arrival of a water ship is the image and expression of failure," added Miguel Angel Fraile, secretary general of the Catalan Commercial Confederation.

As Barcelona expects a 40% average reduction in rainfall during the summer and further 0.5 C rise in temperature by 2020, drastic measures are needed. The Urban Service Infrastructure Tables (TISU) were set up in 2009 by the city's new Resilience Department to organise workgroups by sector and carry out specific projects to reduce any vulnerabilities. The measures include:

- Creation of a Heatwave Emergency Plan (e.g. meals on wheels for those most vulnerable, extending activities at care facilities for the elderly, establishing a water-distribution crew)
- Drafting of a Plan for Green Spaces and Biodiversity
- Microclimatic regulations to minimise the effects of the urban heat island (e.g. incentivising green roofs and walls and green urban design)
- Major investments to guarantee water supply (e.g. making use of alternative water resources, building a desalination plant)
- Education to reduce the very high water consumption per capita, a general problem across Spain

In recent years resilience and climate change adaptation have been a priority for the city. However, there is still a long way to go, with measures to educate the public about how to cope with drought and improvement of planning and management.

Sources: http://www.theguardian.com/world/2008/may/14/spain.water
http://carbonn.org/uploads/tx_carbonndata/Barcelona%20committed%20to%20combat%20climate%20change-Mitigation&Adaptation%20actions_05.pdf

Challenge #6: Utilising vacant urban space

Explain that vacant properties, empty buildings and deserted parks are a significant burden for everyone. While producing nothing, they cost money to maintain (a burden often borne by the public), reduce the vitality and value of neighbourhoods and can aggravate social problems. Revitalising such properties is good for everybody: landlords reduce maintenance costs; local residents get a more convivial, attractive neighbourhood; merchants get more foot traffic and the city gets more tax revenue. There's no shortage of community groups in need of inexpensive space, and many cities now recognise the potential of granting them temporary use of neglected or abandoned spaces. However, many challenges prevent a major breakthrough in this process.

Explain to students that, although temporary projects clearly don't offer permanent solutions, they might pave the way to a more inclusive planning system in which civic initiatives are invited to take part in urban regeneration. By reactivating vacant space for the public good, community groups help City Hall achieve certain goals, for instance reducing crime or joblessness. An important element in the cooperation between the city and the project implementers is trust. Therefore, the various participants in such initiatives (e.g., civic organisations, design studios, real estate developers and municipal departments, etc.) need to be transparent about their motivations and objectives -- and have to follow through with commitments. Otherwise, such projects can't work.

Explain one or two case study to help the students understand the benefits of bottom-up city revitalisation.

Activity: **The Talking Waterfall**

Have a discussion about a disused building or empty lot in the vicinity of your school (e.g. an abandoned cinema, disused warehouse or an undeveloped lot). Prepare by bringing a few large-format photos of the space, and assembling some basic information about it. Ask your students to propose ideas to utilise the space for the benefit of local youth. Ask them what they need most! You can use the "Talking Waterfall" method to generate ideas. The Talking Waterfall is centred around the students spontaneously inspiring each other - the technique supports the students' abilities to think unconventionally and bring spontaneous and unfiltered ideas to the table that other students can build on. The rules of Talking Waterfall:

- The goal is to create association chains that other students can build on, without long pauses in the conversational flow.
- Students are encouraged to interrupt each other and build on and flesh out each other's ideas.
- The students are not allowed to say "No, but…". They can only say "yes, and…".
- The discussion lasts 5-7 minutes and ideas are noted on the blackboard by the teacher. These notes serve as a summary of the discussion.

An example: How would you transform an empty warehouse into a youth community area?
"You should clean it so it doesn't look so dirty and abandoned…"

“Yes, and you should also invite some graffiti artists who can make it look colorful and friendly - maybe they would do it for free ...”
“Yes, and it could be a part of woodshop classes to build wooden shelves and furniture that we can use…”
“Yes, and skateboard ramps could fit in the corner -- we don’t have any good places to skateboard in this neighbourhood ....”
“Yes, and we could also have tools for bike repair… and table tennis.”

Now you will play the role of city mayor. Assign your students into groups of give and give them 10 minutes to prepare arguments to persuade you, the mayor, to transform the space into a youth centre. Ask them to compile a list of reasons that support their claim: What benefits does it bring to the neighbourhood, the city and the mayor? Ask each group to present a few arguments and challenge them as you see fit.

Follow-up

- Visit a local NGO or community that works on a bottom-up urban rehabilitation project.
- Ask students to search for an another abandoned building in their city and write a short essay or school newspaper article where they propose a better use for it. Alternatively, they can also write a fictional letter to the mayor, outlining their plan and asking for his/her permission for the project.
- Launch an urban gardening project with your class. Take care of a small piece of land in the school garden or nearby, plant vegetables or flowers, install some handmade street furniture (e.g. a bench), etc.

CASE STUDY: **Szimpla Garden - Budapest**
The opening of Szimpla Garden in 2002 was a milestone in the alternative life of Budapest. Converting this old aluminium factory – sentenced to demolition - into a huge open-air cinema and pub, Szimpla became a one-of-a-kind venue for non-mainstream concerts, theatrical performances and other cultural events. It started as a grassroots company and called itself a “cultural reception space”, but it gained traction in the local hospitality industry due to its accessible business model: Take a cheap, decrepit space, furnish it with throwaway chairs and tables, and present it as a gathering place for the alternative crowd. Within a few years, “ruin pubs” opened all across town – forming the backbone of downtown’s new identity and contributing to Budapest’s international reputation as a nightlife destination.

From outside, the Szimpla is indistinguishable from the other historic buildings along the cobblestoned streets of Budapest’s old Jewish Quarter. But once inside, you find yourself in a funky bar bustling with people dancing, talking and sipping beers and Hungarian wine spritzers. The interior features mismatched, well-worn furniture; walls festooned with graffiti by local artists; and a cacophony of memorabilia gleaned from secondhand markets: Russian electronic devices, traffic signs, rusty bicycles, even a Socialist-era Trabant car.

By 2015, every ground-level space in the quarter had been converted into a bar, cafe or trendy shop. Hard to believe that just a decade earlier, the area was still suffering from post-war abandonment and avoided by almost everyone. With the alternative utilisation of the old building, Szimpla managed to draw attention to the hidden and forgotten potential of the Jewish Quarter, putting it on the cognitive map of young people in the city once again.

Szimpla led by example in channeling local civil efforts and supporting initiatives for urban sustainability. It continues to host a regular farmers' and flea markets and workshops. It serves as a business incubator and venue of alternative art shows. Today, together with other ruin pubs and community areas, Szimpla fights for the pedestrianisation of Kazinczy Street, the busiest party area of downtown Budapest.

CASE STUDY: **'Christiania Open Nature' – Radical re-imaginings in Copenhagen**

Christiania is a 40-year-old experiment that offers a bold and radical challenge to the way we live in post-industrialised capitalist society and how we could use the public spaces in our city for the benefit of everyone.

Christiania is a 30-hectare alternative, public area in the middle of Copenhagen, Denmark that houses 800 citizens, a realm of offices, historical sites and green spaces. Located on the grounds of a former military barracks, Christiania prioritises resident self-governance, with equality and freedom for residents. It also cultivates respect for the area's natural and cultural value through sustainable and organic development. These ways of thinking affect the construction, decoration and function of the buildings, as well as the plans and conservation efforts concerning the site's natural areas.

Christiania is a car-free oasis that functions as a nesting and resting place for waterfowl, and provides a wildlife corridor for small birds and habitats for a realm of biodiversity. This is a place where the nightingale and cuckoo breed in proximity to the Copenhagen Town Hall Square. Ponds and reed beds serve as a sanctuary for many other varieties of breeding birds, and hundreds of birds rest here in the winter and during migration.

Through dissemination of its "ecological stewardship" plan and through the practice of its eight principles of good nature and eight principles of good stewardship, Christiania is at the forefront in terms of setting a proactive and successful example of biodiversity management and protection within an urban setting. At least a half a million people visit Christiania every year, and each guest has the opportunity to take home some valuable lessons to their own community.

Sources: http://www.urbia.me/projects-3/?lang=en

Challenge #7: Dealing with social exclusion and inequality

Explain to your students that one of Europe's biggest social challenges has to do with economic inequality and social exclusion. In the EU, some 80 million people are at risk of poverty -- meaning they don't have enough income or other resources for a standard of living considered acceptable in their society. In addition, there are 14 million young people who are neither attending school, working or training for employment. These problems have worsened since the financial crisis of 2008 and the long economic recession that has followed. In 2012 in the EU, unemployment stood at 12 percent overall and more than 20 percent among youth.

Poverty is a condition that can lead to social exclusion. Being socially excluded means you don't have access to basic opportunities and resources that other groups take for granted, and that are basic parts of community life. These include housing, health care, education and various means of civic engagement.

Social exclusion can also afflict racial and ethnic minorities, people with physical disabilities, the elderly and young, women and those. When social exclusion means being locked out of the job market, the problem compounds itself, and leads to even greater marginalisation.

Statistics show that in Europe, foreign-born residents are much more likely to be unemployed than those born in the country. And jobless rates are even worse for non-EU migrants than for those who have immigrated from another EU state. And women migrants are more likely to be unemployed than male migrants.

Activity: **The role of chance in economic status**

The day before the activity, ask each student to bring five coins to class (euro cents would do). The activity takes up one hour-long class, give or take 15 minutes depending on the amount of discussion. Instructions can be posted on a slide or in a handout.

Game rules
The game goes in successive, single-elimination rounds of coin tossing, each round lasting two minutes. In each round, you find a partner with coins; one of you calls out a bet of one to three coins, predicting the result of each flip (heads or tails). The winner of each toss takes the coin from the loser. Once you have lost all five of your coins, you are out of the game. If you are eliminated, you may observe from the sidelines and try to figure out if there are better strategies than others for winning.

Winners of each match up should look for another person to play against for the subsequent round. After each two-minute round, someone should tally the number of people with 0, 1-4, 5-9, 10-15, and 16+ coins.

But before beginning, have a short discussion: Ask students how they think the distribution of coins will change during the course of the game? Is anyone more skilled than the other in flipping coins? No, this is not a skill-based activity. If everyone is equally skilled in playing the game, will this preserve the uniform distribution of coins among players (like now with everyone having 5 coins)? Does it mean no one will get ahead? Is that your prediction? Let's test your hypotheses by playing the game.

Post the results on the board or an overhead. Are you surprised at the results?

Follow-up discussion

First, ask the students to consider the importance of skill in this game. Winners should be asked to explain how they won. Further questions for the whole class:

- What do you see as the role of individual skill, actions, efforts, intention? (They did not determine whether you won or lost.)
- Does this skewed distribution (many losers and few winners) resemble any other distributions you know about?

Discuss how the game relates to real world conditions that generate inequality. Consider how modifying the rules might change the outcomes. You can ask students the following questions:

1. What would happen if some players started the game with a different number of coins? For example, someone with ten coins who bets and loses three, but still has a relatively large pool of resources. But if someone with three coins bets three and loses, they lose everything and are out of the game. An initial advantage goes a long way toward success, whereas an initial disadvantage leaves students behind rather quickly. When a player is behind in the game, it is very difficult to gain coins. In the real world, instead of coins, people start with -- or without -- inherited wealth (property, money in the bank, etc.), social and family connections, education and so on. These confer advantages in the game of life.
2. What would happen if bankrupt players could borrow coins to get back into the game? In the real world, people (and organisations) differ not only in their wealth and income, but in their access to credit (loans). Some people (or businesses) have easier access than others, thus can cope better with misfortune.
3. What would happen if some players could pool their resources and play as a group? In the real world, we are connected to groups of relatives, friends and acquaintances who have economic and non-economic resources that can help, or maybe hinder, us. What do you see as the benefits of cooperative arrangements?
4. What would happen if a wealth or inheritance tax had been imposed between rounds? Suppose winners had to turn over 20 percent of what they won to those at the bottom of the distribution? What would be the result? [The game could go on with more people involved.] Most societies limit inequality with taxes on the accumulation and transmission of wealth, while the game had no such provision. Why do you suppose most societies have such limits? What are the risks of "too much" inequality? How did those of you who went bankrupt feel? Apathetic? Angry? Ready to stage a revolution? In the real world, if

such feelings build, large costs are required to maintain social control. How is “too much” defined, by whom and through what processes?

These are all interesting sociological questions. How much does the coin toss simulation mimic and differ from the rules of life? What about the role of talent and determination in the real world? Is it irrelevant, as this game suggests? The game depends on luck only and is designed this way in order to highlight the importance of rules that are easily overlooked in the complexities of real life. We shouldn’t conclude that talent and individual effort make no difference in the real world, only that they’re not the only factors. Life’s fortune’s also depend on rules, social status, and advantages given to us at birth. The principles of cumulative advantage and cumulative disadvantage constrain an individual’s life chances, and help to explain stratification processes and outcomes. This is another reason many societies limit the amount of inequality that they allow to develop within them, because there is no telling who will be hit, for example, by the closing of a factory, layoffs, a catastrophic illness, a natural disaster, a terrorist attack, and so forth.

Another question to consider: In what kind of a society do you want to live? One where inequalities of wealth and income continue to grow or one where all members of society feel that the distribution of wealth and income is reasonably just?

Do you want public policies or the rules of the game to be ones that intensify the trend toward greater inequality, or do you want public policies to limit such trends? Do you, or will you, work politically to achieve the kind of society in which you want to live? If you don’t, those in the top 10 or 20 percent of the distribution will carry the day, continuing to change inheritance, income tax, and social service policies to benefit them, thereby furthering the trend toward inequality in our society.

CASE STUDY: **Goldfinger: upscaling through mobilisation**

No, not the notorious Bond-film villain: Goldfinger Factory—part community centre, factory workshop and café—lies at the foot of the Trellick Tower in west London. The factory—or, centre—which takes its name from the tower’s somewhat notorious Modernist architect, Ernö Goldfinger, is the brainchild of one Oliver Waddington-Ball. The young social entrepreneur struck on the idea while working as a management consultant, advising companies on how to become more community friendly.

The centre trains and employs local residents from socially disadvantaged groups to convert old furniture, bric-a-brac and other unwanted goods from charities and second-hand shops into attractive items that are again offered for sale to an up-market clientele, a process known as “upscaling”. Artists and craftspeople with no workspace of their own are given use of Goldfinger’s basement workshop; what they give back is part of the profits from sales to allow the centre to carry on, as well as some of their time to others to acquire basic craft skills.

“One man’s muck is another man’s gold,” Waddington-Ball quips in a *Domus Nova* interview. “Watching the success of the London Reuse Fund [a service he was involved with that allows

individuals and business to offer up products, materials and waste for future use], I realised that you could apply the same model to people, asking those who are able to offer up services, support, teaching and mentoring to those who need to learn and grow their abilities."
Waddington-Ball's industry and contagious enthusiasm won him support from the Kensington and Chelsea Borough Council for his start-up fund, facing stiff competition from the British Red Cross, British Heart Foundation and The Prince's Trust.
In addition to providing workplace skills and chic-and-unique products, Goldfinger Factory has a built-in 'lifestyle element' as well. It's a place to meet, discuss ideas and ponder the future. Also attached is the acclaimed and alcohol-free Redemption café, which serves homemade food and Fair Trade coffee. "By being consciously abstemious," says Waddington-Ball, the café "welcomes all cultures."
Quoted in *Le Cool*, Waddington-Ball sums up his enterprise and love for his local community with the following: "It's about mobilising a poor community through the medium of design and waste reduction. Rather than being isolated from the surrounding community because of the wealth gap to interact and tell a bit of a Robin Hood story—how, if you give people the right tools they can change their own circumstances."

Sources: Lux Magazine, Domus Nova Magazine, Le Cool

CASE STUDY: **Budapest's Teleki Square: participatory planning for use of public space**

Public spaces play important roles in shaping and communicating community identity. A public space that buzzes with life and activity conveys feelings of purpose and belonging, while a neglected space projects an aura of communal malaise and despair.

Until very recently, Teleki Square in Budapest's District VIII mirrored the general poverty and frustration of its surrounding inhabitants, but a collaborative redesign effort involving several members of the community has transformed this large park area into a multi-purpose public space with great potential to transform the community as a whole.

While the benefits of investing in such efforts might appear to be obvious, there are usually plenty of obstacles to overcome, according to Kristin Faurest, a community reinvention expert involved in the Teleki Square project. "There might be lack of motivation or funding on the part of the government," says Faurest, "or competition from developer-driven projects that result in gentrification instead of spaces for everybody. There can also be opposition from residents if there are plans for something like a concert hall or other facility that could generate noise or crowds."

Architect Dominika Tihany highlights another difficulty: "Oftentimes, EU tenders don't leave enough time to actually complete such long-lasting processes."

And even when a project gets the green light from city hall, there's no guarantee of active community involvement. "Municipalities often take the old-school approach," Faurest explains. "Either one-way communication—like having an email address you can write to, or a questionnaire, or the most dreaded 'idea box'. Or, they just bring out two-thirds finished plans and you can choose between option A or B, which is not participation—it's manipulation."

Regarding the Teleki Square project, "most people from the municipality didn't have a clue that we would *really* be involving local people the way we did," says Tihanyi. "And the ones who did know were very skeptical. All I could suggest was to have faith in the project and the people. Later, the vice-mayor attended the final presentation—and at the end, when locals presented the plan, she couldn't wait to express her astonishment that people could be so committed to changing their environment."

Given how detailed the Teleki project was, weekly meetings took place between plan developers and locals over the course of three months. "One of the most important results of the regular meetings was that citizens formed a 'Friends of Teleki Square' group that is still really active in the park's everyday life," says Faurest. "We found that by giving people assignments that they could be a constructive part of the process, and they got interested because they made the mental investment."

CASE STUDY: Italy's community-based refugee resettlement programme (SPRAR)
Other example: Brussels? Molenbeek, even?

Final Session: Creative Workshop - The Two Islands

Ideally, before embarking on this activity, the class will have gone through the introduction (Opening Session: Growing Cities, Gnawing Challenges) and preferably some of the specific Challenges and interactive activities. This game, “Creative Workshop - The Two Islands”, is a nice way to wrap up the curriculum and gives students an opportunity to apply the lessons learned in a fun and interactive way.
Students can help prepare by bringing some colourful newspapers and magazines on the day of the activity. The game can be played in a large open room or classroom with desks and chairs pushed to the walls. In the game, students create a two or three-dimensional model of a city out of various materials, then rapidly generate ideas and solutions for emerging problems, while continuously interacting with their peers in order to quickly and efficiently address challenges. During the course of play, they will get better at rapidly visualising their ideas in a simple way.

Photo: Attila Katona

Activity 1 - Storytelling (10 minutes):

To launch the workshop, begin with this story:

Ivan Gantschev: Two Islands (1985)

"Once there were two islands, Greenel and Graynel. They sat in the middle of the ocean with a wide stretch of deep water between them. The very first people who came to the island of Greenel found a peaceful place with tall green trees and dark, fertile soil. Their leaders said, “Since we are here in the middle of the ocean, and our island is only so big and no bigger, we will all have to work very hard to tend it and keep it as lovely as it is today. If we are careful and wise we will be able to grow our own food and learn to make the other things we need to be happy and comfortable.” And down through the years, that is the way it was on Greenel. Life was simple and it moved at the pace of the Sun and the Moon and the changing seasons.

The first people who ever came to Graynel found an island very similar to Greenel—quiet and green and lovely. But their leaders said, “Since our new land is here in the middle of the ocean and is only so big and no bigger, we will have to work very hard if we are to keep up with the rest of the world. We will have to build ships and factories and use all of our land very wisely or we will never be able to make and buy all the things we want.” There were changes on Graynel, big changes. Even though the island was small, it kept up with the world, and life on Graynel moved at the pace of the shipping timetables, the factory clocks, and the traffic lights.
Life on Graynel became very complicated. There were so many factories to run, so many clocks to keep set on the same time, and so many highways to build, that the people of Graynel decided they needed someone who could take charge of the whole island. And so they elected Gordon D. Warden to be The Boss. He promised that if he were The Boss, then Graynel would be the best and the richest and the busiest and the most famous little island in all the world. He also promised that there would be jobs and cars and money and plenty of everything for everyone. What he said was true. In a very short time there were so many more factories built that almost everyone had two jobs. The people had so much money to spend that everyone had at least one car, and they had so much money left over to save that there were more banks than there were gas stations. The citizens of Graynel were so pleased with all this progress that statues honouring Gordon D. Warden popped up all over the island. Because all the land was needed for buildings and factories and highways, the whole island seemed like one big city. Where there used to be fields and forests, there were only a few tiny parks, just big enough for one or two people to visit at a time...."

Activity 2 - Build your city! (30-35 minutes)

After the storytelling, split your students into two groups of equal size (cater to their preferences, but have an equal number of students in both groups). These students will form the inhabitants of Greenel and Greynel, and they will have to design their city in line with the story, but with their own creative ideas. For this, we suggest each group to tape flipchart paper sheets together to form a square creative canvas approximately 2.5x2.5 metres. On this they can draw and build their islands.

Give students enough time to build (30 minutes) and provide them the necessary resources, such as glue, scissors, coloured paper, newspapers and magazines, post-it notes of different colours, aluminium foil, a pack of flipchart sheets, plasticine / modelling clay, markers or sticks

of chalk, string, cardboard, elastic bands, straws, paper clips, cotton balls, steel wire, wooden sticks, bottle caps, glitter, confetti and so on -- whatever you think will do as raw material.

Side activity (extra 5 minutes): each student should pick a role or profession he or she plays in the island's everyday life and list these roles on a piece of paper.

Photo credit: Attila Katona

Activity 3 - Lead the way! (15 minutes):

The students will now take up the role of tourists or tourist guides and listen to the introduction with their eyes closed:

- Each student has to pair up with someone from the other island: one plays the tourist, the other the tour guide (in case of an uneven number of students, form some groups of 3)
- The tour guide welcomes the tourist to his/her kingdom, explains how they live, shares an interesting story about the island and introduces the island's main features. This should take 3-5 minutes.
- Then they switch roles and the representative from the other island gives a similar introduction of 3-5 minutes.
- It is advised that during these introductions, the tourists keep their eyes closed in order to better imagine what they hear. They blindly follow the lead of the tour guide and only open their eyes after the storytelling is over.
- At the end of the activity, each pair should discuss their experience and give mutual feedback. Encourage them to share feedback and impressions with the entire group as well.

Activity 4 - Tackling challenges (35-40 minutes)

Split the students of each island into groups of roughly equal size (3-5 students/group). Each group draws or receives a card with a Challenge from below (a short description and two case studies).

- Challenge #1: Ensuring a sustainable food supply
- Challenge #2: Securing clean and efficient sources of energy
- Challenge #3: Developing green transport systems

- Challenge #4: Addressing the consequences of an ageing population
- Challenge #5: Adapting to climate change
- Challenge #6: Utilising vacant urban space
- Challenge #7: Dealing with social exclusion and inequality

Students have 15 minutes to come up with solutions to the given challenges (which can range from serious to absurd). They then need to come up with a solution and prepare a short, visual presentation. When 15 minutes is up, each group will have three minutes to briefly present the problems and solutions. Then each group will have to "pose" for a photo for the headline article of the Global Newspaper which is curious about their solution and would like to take a photo of it in action. On a flipchart, students should write a headline for the newspaper article oand may use the available material in the room to illustrate the cover photo.

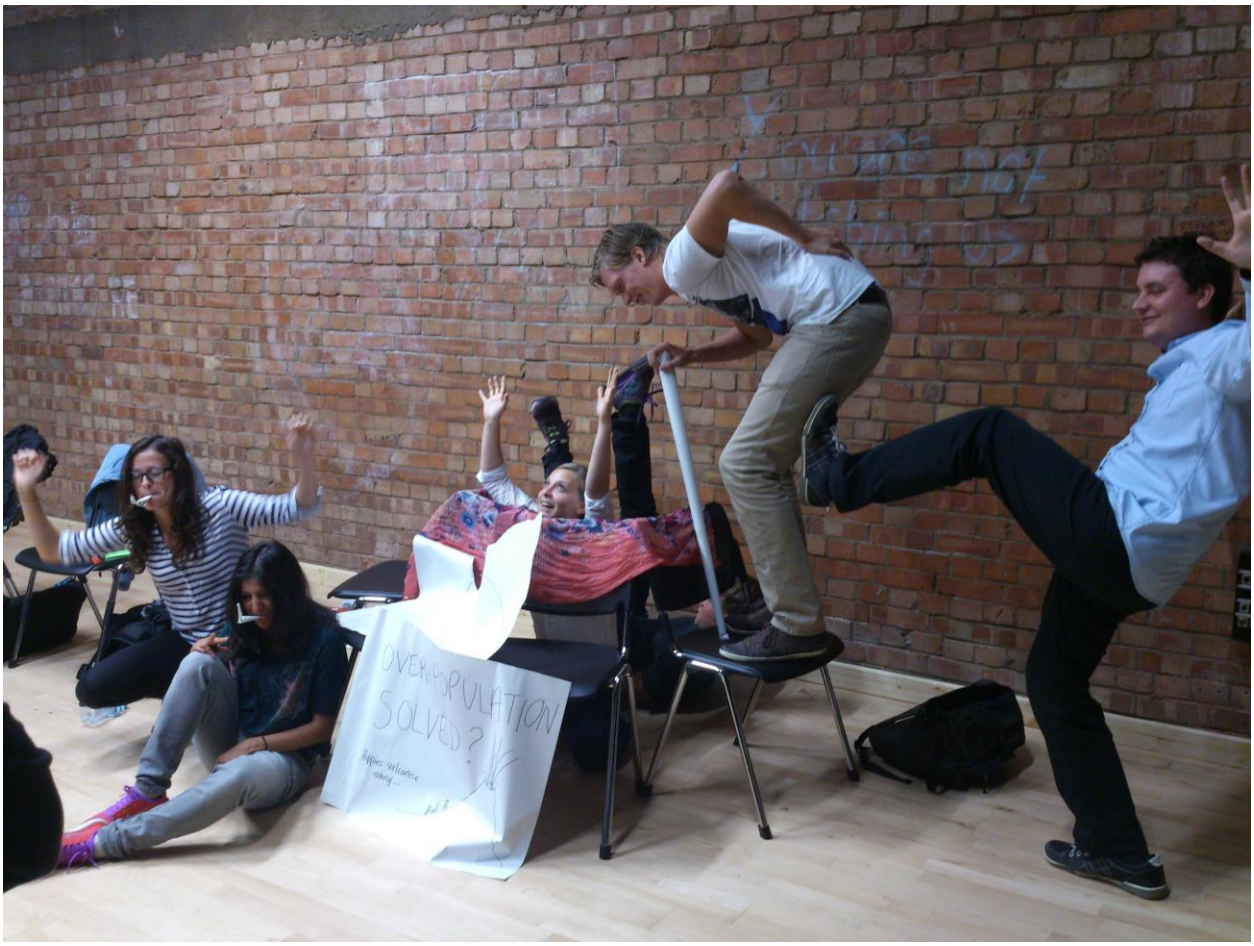


Photo credit: Sebastian Boehmer

Activity 5 - Innovate for the future! (25 minutes)

Students stay in the same groups as in Activity 4 and are asked to brainstorm innovative, business ideas that would be perfect for their islands. After five minutes, the groups of each island merge back together with their fellow inhabitants and choose the best ideas from the small groups. Each island then has to "pitch" their business ideas to the inhabitants of the other

island and to the teacher (aka the investor). The students have 10 minutes to prepare for the pitch and every student has to be part of this presentation. For instance, if one student explains the idea, the others act and play along in the background to demonstrate the ideas. This will demonstrate team effort.

Side activity (extra 10 minutes): You can also suggest to the class them to dress up and decorate their mayor/spokesperson according to their idea or culture using the same materials as above. You may want to give them extra 10 minutes for this side activity.

Follow-up:

- Take pictures of each activity, and pin the results up on the classroom wall. Have students write an article to the local newspaper and celebrate the achievements with your class!

- In order to keep up the momentum, you could organise a 120 minute workshop with the World Café methodology with six invited experts and six student teams on three different topics. This could take about an hour, with three 20 minute workshop rounds. World Café is a simple, effective, flexible format for hosting large group dialogue with interesting ideas and outcomes.