WELL-BEING IN A SUSTAINABLE ECONOMY REVISITED

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Abstract

We explore the profile of a happy city and a sustainable city. This inquiry is important for understanding whether there exists conflict between sustainability and happiness. The answers demonstrate that the two profiles overlap. A city with public transport and bicycles, full of walkable, mixed-use neighbourhoods, abundant vegetation, spaces for sporting activity and pedestrian areas is both happy and sustainable. An urban project based on the quality of green spaces and public transport promotes relations, and therefore limits energy consumption. It is an environmentally non-aggressive project, because it is not aggressive towards humans. The happy city is sustainable, because it breaks the vicious circle of defensive growth. It is also an inclusive and participated city because improving the quality of what we have in common means democratising urban quality of life. Happy and sustainable cities agree that private cars as an urban transport system is not ideal. Cars are very useful outside cities, but in cities they are only useful if shared, especially at night when public transport is limited or ceases. The conclusion is that it is not necessary for us to give up anything to make our cities sustainable, we simply have to live in them better. The urban lifestyle that makes us unhappy is also very energy-intensive. The urban form prevalent today is a paradigm of defensive growth. This is why contemporary cities are both unhappy and unsustainable.

Urban Planning

1 Green and Happy Cities

What are the features of a sustainable city? Cities are critical for sustainability because most harmful emissions come from urban areas, where most transport, industry and half the world's population are concentrated. In 1950, the urban population was one third, and in 2050 it is predicted to be two thirds of the world population. Therefore, identifying the features of a sustainable city is crucial for the whole ecological transition project.

In this section we also review the features of happy cities and compare them to the features of sustainable cities to check whether they have something in common. This comparison is crucial to test one of the main theses of the WISER project: that a sustainable society is possible in which people live better than in the current unsustainable society (see position paper D1.1). If the changes needed to make cities sustainable reduce the happiness of their populations, the WISER's thesis would be very weak. In fact it, would become difficult to think that happiness and environment go hand in hand on a vast scale, considering the importance of the urban question in ecological problems.

There has been much research on sustainable as well as happy cities and it offers clear answers to these questions.

2 The Sustainable City

Stefano Mancuso, a world famous botanist, recently launched a proposal to cover cities in plants. Not only flower beds, avenues and gardens, but also roofs, building facades, schools and even sport stadiums. "Wherever a plant can grow, there should be one."[1] Cities are the main sources of CO_2 emissions. Plants are the main absorbers of CO_2 and their capacity to absorb increases with closeness to emission sources. Mancuso's green cities would therefore have a big impact on climate.

This proposal is an evolution of sustainable city projects. The best known example is probably from Copenhagen, a city fast approaching carbon neutrality. It is an ambitious experiment of world importance, as well as many other Northern European cities following similar projects. If they work, we will have the first example of cities that do not contribute to global warming.

How is Copenhagen pursuing this objective? It is reorganizing public spaces. The city is full of parks and green areas. There are 2260 hectares of public green spaces amounting to 25% of the city's area. This equates to 42 m^2/person.[2] 96% of Copenhagen residents live within 15 minutes walking distance of a large green or blue space. Blue spaces are parks along waterways. A new nature reserve of 36 ha is planned in the North Harbour industrial area.

We are not yet ready for Mancuso's radical proposals of plant-construction fusion, but it is the path to take. Copenhagen's idea is that by filling cities with small green areas known as "pocket

[1] Repubblica, 27 August 2019
[2] https://ec.europa.eu/environment/europeangreencapital/wp-content/uploads/2012/07/Section-3-green-urban-areas_Copenhagen.pdf

gardens", green space can be within walking distance for people wherever they are. The pocket gardens are usually less than 5000 m2 and are created in abandoned allotments, like street corners, spaces between houses and local squares. Green spaces are increasingly part of the daily routine of citizens as places to meet, for physical activity, walking, relaxing, chatting, reading.

A pocket garden in Copenhagen

Another aspect of Copenhagen's sustainability initiative is a declaration of war against automobiles. The use of cars has been strongly limited and made more costly. For example, by making parking expensive. Above all, the city council has concentrated on alternatives to the private car. It invested strongly in infrastructure for bicycles such as bike tracks, overpasses, parking, and cheap electric bike-sharing. Now 45% of Copenhagen residents go to work or school by bike, thus reducing CO_2 emissions by 100,000 tons per year.[3]

A bike overpass in Copenhagen

[3] https://ec.europa.eu/environment/europeangreencapital/wp-content/uploads/2013/02/Copenhagen-Post-Assessment-Report-2014-EN.pdf

Copenhagen has also been investing in making public transport very efficient. It is of course easier to organize public transport in a city where the buses are not held up by cars, since cars are now used by very few citizens. The city has also devised a strategy to encourage people to walk. By decentralizing amenities such as post offices, parks, schools, healthcare and sport centers, and shops as much as possible, it reduced people's need to move across different neighborhoods within the city. This city model is called the "quarter-hour city," meaning that all points of interest must be within 15 minutes' walk, no matter where one is in the city.

Copenhagen's approach to sustainability is participatory, centred on effective information campaigns aimed at making citizens more responsible. Citizens collaborate because they feel part of the solution to the problem. Copenhagen is an inclusive city. Transport and access to major green spaces are democratic, being the same and affordable for everyone. Even members of parliament go to work by bicycle.

Copenhagen and many other cities demonstrate the traits of a sustainable city: participation, inclusion, neighbourhoods with their own amenities, an abundance of green spaces and transport based on bicycles, public transport and sharing.

3 The City and Relationships

Let us now examine the traits of a happy city. Since relationships are important for happiness, a happy city is principally a relational city and is organized in way to facilitate relationships. For thousands of years, cities brought people together. The square, where citizens of all ranks could meet, was a symbol of this. Common urban spaces, the streets and squares –almost always only for pedestrians– created the social fabric. European cities grew slowly over centuries, adding new neighbourhoods around new squares. Sociability required a certain proportion between common and private space.

This continued until a few decades ago, when the first epoch of urban life, which had lasted about 5000 years, came to an end. The second epoch commenced with the advent of automobiles. After that, everything changed rapidly. Common space was invaded by cars. The human environment *par excellence*, i.e. the urban environment, became a dangerous place for humans. While walking the city streets of Italian cities, which were deserted during the lock-down for COVID-19, many Italians were struck by the way the brain unconsciously registers being in a dangerous environment when they are surrounded by traffic. Tens of thousands of pedestrians die in car accidents every year in Italy. Yet, even when they do not kill, cars invade. They invade our lungs, our ears, our footpaths and roads. They obstruct buses and require very expensive roads and infrastructure. Thus, common urban spaces lost their role of bringing people together and cities became places where people meet solely to shop or to work (Montgomery 2015).

Since the advent of the automobile, cities have been built for cars and not for people. In neighbourhoods built since WW2, public spaces have given way to private spaces: more and more houses, fewer and fewer squares, which are increasingly congested with traffic. Most European cities acquired anonymous indistinguishable peripheries and saw a drastic decline in the quality and quantity of common spaces, and their capacity to encourage relationships.

Shopping centres became meeting places. Their advantage is that they are limited to pedestrians. Families and young people spend their free time there. The purpose, however, is not to bring people together, but to sell. Sociability is immersed in marketing pressure that makes it undemocratic and frustrating for those who cannot buy.

4 The City, Children and the Elderly

Everyone is affected by this situation, but especially persons (i.e., the elderly, children and the disabled) whose opportunities to socialise depend largely on the existence of a social fabric at walking distance The social context that was once outside their front doors has disappeared. Thus, cars in cities generate relational inequalities between generations. The elderly and children are population groups with a high risk of loneliness. In the US, 80% of children under 18 and 40% of persons over 65 report feeling lonely (Berguno et al. 2004, Pinquart and Sorensen 2001, Weeks 1994). In Italy, a study on young people in the final year of high school showed that 62% of girls and 36% of boys often felt lonely.[4]

It is completely new in human history for children and young people to live lonely sedentary lives. The transition was complete by the end of the 1980s. In a single generation, since the 1970s, the "radius of activity" of children, the area around their homes where they could move on their own, shrank by almost 90% (Gaster, 1991). Between 1969 and 2001, the percentage of students in the US who went to school autonomously fell from 40.7% to 12.9% (McDonald, 2007). The phenomenon is not exclusively American. Children's mobility and independence have been affected all over the industrialised world. In 1971, 80% of children between 7 and 8 years of age in Great Britain walked to school, often alone or with friends. Twenty years later, less than 10% walked to school and almost all were driven to school by their parents (Hillman et al. 1990). Today, two out of 10 children have never been in a shop or a park alone (Moss 2012). About one in every two adults consider that 14 years is the minimum age for children to be able to move around town alone.

"Only one generation ago, a ten-year-old had more freedom than an adolescent has today" is the alarming conclusion of an English report on the condition of children (Children's Society 2007). This radical transformation children's lives has a series of harmful effects, ranging from lack of contact with nature to an epidemic of obesity from an increasingly sedentary life. Juvenile obesity has tripled (LaFontaine, 2008) since children's physical activity was thus limited (Salmon and Timperio 2007).

By limiting contact between them, these changes in children's lives translate into relational deprivation. When children played in the street, they formed groups. Involvement in interpersonal dynamics taught them social skills that were theirs for life. Before children experienced the world through people. Now they do so through screens. Before children had adventures in the real world. Now they have digital adventures.

[4] https://www.insalutenews.it/in-salute/i-social-e-la-solitudine-dei-giovani-doggi-sempre-connessi-ma-piu-soli-sfogano-il-disagio-nelluso-di-antidepressivi/

This situation has made children more reliant on their parents than ever before in any society. Any relational possibility for them depends on their parents. If their parents do not load them into the car and take them to find their peers or to an activity, they remain isolated. The autonomy of children has evaporated, which makes parents the target of their complaints responsible for any dissatisfaction or difficulty. It is an enormous responsibility to be solely responsible for a children's experience. Many parents are aware of this burden. The lack of children's autonomy a forge of family tensions and has made the parent-child relationship obsessive.

The fact that many adults complain about prolonged adolescence is one of the many signs of our culture's lack of awareness of the epoch-making transformation that infancy has undergone. Compared with before, young people have less social experience and less independence, which are both great sources of learning. Their slow maturation is therefore not surprising.

Similar considerations hold for the elderly, whose social life was immersed in a network of relationships until several decades ago, and they now flounder in a sea of isolation. The paradox of the modern city is that it has created solitude in a place invented to create relationships.

5 Cities as Drivers of Defensive Growth

In position paper D1.1, we introduced the concept of defensive growth, which is a key topic in the WISER project. When economic growth is defensive, the economy grows because of defensive spending. Defensive spending refers to the spending that people do to defend themselves from the decline of common goods, such as the environment or human relations. Cities are a paradigmatic example of defensive growth.

Infancy has become more expensive since the revolution in children's lives. Parents have to fill their solitude with toys, screens and baby sitters. The solitude industry also includes a flourishing sector for the elderly, which is largely a substitute for relationships that were previously free. Until a few decades ago, the social fabric of the neighborhoods took care of the elderly when they were old, alone and infirm. Now this fabric is lacking, making carers and rest homes necessary.

Even expenditure for elderly healthcare is partly defensive. Indeed, solitude is the main risk factor for the health of the elderly. Namely the population group that weighs most heavily on healthcare spending. As shown in the section on healthcare (section 5), isolation causes deterioration to the immune, cardiovascular and lymphatic systems, and drives the elderly to less healthy lifestyles, including poor nutrition, increased smoking and consumption of alcohol. This is why elderly persons living alone fall ill more often. So the healthcare industry, too, grows on the substrate of solitude.

The escape industry prospers from this deteriorating situation. The tense and conflicting relationships we have created in our frantic, noisy, polluted cities force us to escape more often towards nature, slower lifestyles and relations. Or to meditation courses. Or to drugs. The escape supply goes well beyond the holiday industry. Then there is the fear industry, embodied by the army of cameras, alarm systems and uniforms that increasingly populate our cities.

The deteriorating quality of common space has also created an urban entertainment industry. Modern cities respond to the poverty of free meeting spaces with an abundance of costly things to do in one's free time. In one's free time, economic inequality has a great impact on happiness, because free time is relationship time. People with lots of money have access to the complete kaleidoscope of urban entertainment and for those with little money, screens are the only possibility. The disappearance of opportunities to spend one's free time with little money is a powerful incentive to earn money, which in turn feeds economic growth.

The modern city is the emblem of defensive growth based on the destruction of commons. High quality items are private (beautiful houses, restaurants, shows, night clubs, fashion shops); commons (social atmosphere, streets and squares) are noisy, polluted, dangerous and degraded.

In many ways, the common decay transforms individuals into diligent workers and consumers. People seek to escape anonymous soulless degraded neighborhoods by working and consuming more, living with stress and haste, and increasingly relying on motor vehicles. They need money. By acting in this way, they contribute to the environmental and relational degradation that they seek to escape. It is the vicious circle of defensive growth. Modern cities are a pillar of a type of social organization that produces private wealth and common poverty.

6 Reducing Car Dependency

Where cars are less important and where there are alternatives for motor vehicles, people are happier and more inclined to establish relationships. These ideas are from New Urbanism, which is a town planning movement centred on walkability.

Walkable neighborhoods are high density and mixed use. Mixed use means that they serve many functions (e.g., residential, commercial, recreative, occupational). These neighborhoods reduce car dependency and encourage people to walk, because amenities such as post offices, public gardens, sports grounds, bars, restaurants, libraries, hairdressers, are within easy reach. Contemporary peripheries, on the other hand, consist solely of houses. It is impossible to meet daily needs on foot. Residents have to drive, sometimes long distances, to get to shopping centres, which are usually built on main roads with heavy traffic.

The high residential density necessary for walkability contrasts with the low density neighborhoods, which are typical for American suburbs where single family houses are surrounded by gardens. Here distances increase due to population low-density, which makes people dependent on cars. It is also difficult to organize economical public transport in these neighborhoods, because buses are never filled.

In walkable neighborhoods, people have more possibilities to engage in casual interactions (encounters, conversations, exchange of favors). This strengthens the social fabric, the participation of residents in district-associated activities, and a feeling of community. According to happiness economist John Helliwell, the encounters we have while walking or cycling tend to engender trust. The frequency of positive interactions is the key. Encountering neighbours, exchanging a few words with them or just greeting them encourages trust and a feeling of being in contact with people and places. Nothing similar can happen when we are boxed in our cars. Trust mirrors happiness. Even in

neighborhoods, the most happy ones are the ones in which people trust their neighbors (Lu et al. 2015).

Commuting exerts a high toll. People who commute for more than 45 minutes are less happy, and have a 40% higher probability to divorce (Olsson et al. 2012). People who live in suburbs where they have to rely on their private cars claim to be less happy and have fewer relationships than residents of walkable neighborhoods.

Studies comparing traditional high-density neighborhoods with low-density suburbs record more social interactions and sense of community in the former (Kim and Kaplan, 2004, Lund, 2002). Other studies concentrate directly on the degree of walkability, measured with a widely-used index (Frank et al. 2010) based on objective and/or perceived measures that generally combine three factors: population density, ratio of the area considered and the amount of shops within it, and the degree of mixed use space. These studies show that walkable neighbourhoods improve social interactions and generate a greater sense of community (Leyden, 2003, Lund, 2003, du Toit et al., 2007, Wood et al., 2008 and 2010, Rogers et al. 2011, 2013). Even walking the dog acts as a catalyst for building and fostering relationships (Wood and Christian 2011). Walkability also has a positive impact on crime rates (Gilderbloom et al. 2015). Walkable neighbourhoods have more eyes on the streets, which is a good deterrent for petty crime.

These results have been replicated in cities in North America, Europe, Asia and Oceania. Walkability has received too little attention for too long in town planning, but things are changing. Urban planning aimed at improving relationships is now consolidated in many northern European cities and is emerging in the rest of the world.

7 Green Spaces and Relationships

The key to sociability is quality public spaces, where quality means pleasant. Urban space is pleasant not only due to aspects linked to reduced traffic, walkability and pedestrian areas, beauty matters too. The aesthetics of urban environments play an important role in promoting social connections (Sullivan and Chang, 2011, Wood et al. 2008) and a sense of belonging to places (Law and Altman 1992). Conversely, ugly and neglected environments reduce the sense of belonging to a community and encourages anti-social behaviour. In a series of experiments, Keizer et al. (2008) showed that neglected urban spaces increases the propensity to leave rubbish outside the bins, not return supermarket trolleys, and theft.

Greenery, however, is what makes urban space most attractive and pleasant. The topic has been widely studied. Previous research shows that the number of trees in city spaces is a strong predictor of the time people spend there (Coley et al., 1997), and the more people stay outside, the more they weave relationships. In greener neighbourhoods, people have more bonds and a greater sense of community (Kim and Kaplan 2004). Even people who live in high-rise blocks with trees in the courtyard have a greater sense of community than those with treeless courtyards (Nasar and Julian 1995). A study conducted in Western Australia revealed that the proximity and quality of public parks and gardens is positively associated with sense of community (Francis et al. 2012). In Dutch

cities, fewer green spaces near home coincides with a perception of solitude and lack of social support (Maas et al. 2009).

Studies of this kind have been conducted in cities on every continent and the results have been the same: greenery is a strong catalyst for urban relationships. Its effectiveness extends to extreme cases, as evidenced by a series of renowned studies on a decaying and crime-ridden public housing district in Chicago. The residents of houses with more vegetation around them showed stronger bonding with each other and a greater sense of community (Kuo et al. (1998), they committed fewer crimes (Kuo et al 2001a) and were less involved in violence (Kuo et al 2001b). Small initiatives like urban gardens, small allotments cultivated by small communities, have a strong effect in creating a sense of community (Stuart 2005, Kingsley et al. 2006).

Green spaces are social arenas and vegetation is the form of urban decor with the greatest beautifying effect and the least cost. To have them within walkable distance is important for everyone, but especially for children and the elderly who mostly move about on foot (Maas et al. 2009, Coley et al. 1997).

8 Green Spaces and Happiness

Recently American researchers identified more than 500 small abandoned lots in Philadelphia, where the vegetation was unattended and people had dumped rubbish (South et al. 2018). The researchers interviewed hundreds of people who lived near the various allotments for happiness and mental health indicators. Then they *cleaned and greened* one third of the allotments. They removed the rubbish, planted grass and trees, put up fences and did ordinary maintenance. In another third of the allotments, only the rubbish was removed, without touching the vegetation. In the last third, nothing was done (control group). The following photos show an example of the work done.

Greening and Cleaning of Abandoned Allotments in Philadelphia

Before

After

Source: South et al., 2018.

A year and a half later, the researchers returned to interview the same residents. Those who lived near the restyled allotments showed a 41% decrease in depressive feelings and a 51% decrease in feelings of worthlessness with respect to persons who lived near the control allotments. The impact was particularly strong in poor neighbourhoods. In such districts, caring for these small pieces of urban space seemed to have a special beneficial effect on mental health.

The study suggests that there is something special about green spaces, since people who lived near allotments that had only been cleaned of rubbish did not show significant benefits in terms of mental health. *Cleaning* was not enough; *greening* too was necessary.

Moreover, participants living near treated vacant lots reported significantly reduced perceptions of crime (−36.8%), vandalism (−39.3%), and safety concerns when going outside their homes (−57.8%, $P < 0.05$), as well as significantly increased use of outside spaces for relaxing and socializing (+75.7%). Significant reductions in crime overall (−13.3%), gun violence (−29.1%), burglary (−21.9%), and nuisances (−30.3%) were also found after the treatment of vacant lots in neighborhoods below the poverty line (Branas et al. 2018).

Many other studies show the contribution of green spaces in reducing mental distress (van den Bosch et al. 2015, Zhang et al. 2015). This contribution is an extreme aspect of the capacity of vegetation to promote happiness in general. The topic has been studied for decades. Dozens of studies on cities and districts draw the same conclusion: vegetation has a positive impact on many happiness measures. Exposure to greenery reduces negative emotions such as anger, fatigue,

anxiety and sadness and promotes positive emotions such as feeling full of energy (for a review, see Bowler et al. 2010). Another study studied blood concentrations of cortisol, a biomarker of chronic stress, in American citizens. Concentrations varied significantly in relation to exposure to green spaces, indicating that those who had easy access were less stressed (Ward et al. 2012). The accessibility of green spaces also counts. Comparing two neighbourhoods of the Dutch city of Groningen, similar in amount of green spaces but with different accessibility, Zhang et al. (2017) showed that where green spaces was more accessible, residents were more satisfied with their neighbourhood, which was in turn linked to happiness.

The effect of green spaces on happiness is partly mediated by its effect on sociability. Green spaces help people to weave relationships and therefore be happier. But nature promotes happiness not only because it helps us have good relationships, it also makes us feel better when we are alone. Indeed it has great properties in inducing recovery from mental fatigue, in reducing stress, and in recovering concentration (directed attention), all aspects linked directly with happiness (Basu et al. 2014, Groenewegen et al., 2006, Hartig 2017, Yen et al., 2009).

A study of 101 US high schools showed that students scored higher grades where the school canteen had a view of green space (Matsuoka 2010). The author attributes this effect to the capacity of green spaces to sooth mental fatigue during pauses. This mechanism also works in students with various disorders. A study on students with attention deficit disorder showed that those who passed their intervals in green spaces had milder symptoms than those who passed them in built environments (Faber Taylor and Kuo 2011). In any case, contact with nature strengthens self-control in healthy children (Taylor et al. 2002).

Green spaces also help people live better in the most stressful situations, such as those experienced by cancer patients in chemotherapy who are facing uncertainty about their outcome. Patients undergoing surgery to remove tumours have faster post-operative recovery if they walk in nature and cultivate a garden (Cimprich 2003).

Contact with nature tends to become a consolidated part of our experience. Children who have had frequent contact with nature when they were little maintain frequent contact also when adults and consider the protection of nature to be important (Ward et al. 2008, Wells et al. 2006).

9 Vitamin G

Vegetation affects mental as well as physical health (for a review, see Van den Berg et al 2015 and Gascon et al. 2016) to the point of being named Vitamin G (Groenewegen et al. 2006). Vegetation in residential areas influences perceived health (de Vries et al. 2003, Maas et al. 2006), the spread of disease (Maas et al. 2009) and death due to cardiovascular and other diseases (Mitchell and Popham 2008). The quality of green spaces in terms of access and use is also important for health (Akpinar 2016, Van Dillen et al. 2012). The impact of vegetation on health is not surprising because contact with nature contributes to happiness and there is a strong link between health and happiness (see section 5 of this appendix).

The effect of nature on physical health is so strong that doctors are beginning to prescribe it. An average of ten times a day, Dr. Zarr, a Washington pediatrician, prescribes time spent in parks for

his patients. In 2017 he founded Park Rx America to help healthcare personnel prescribe nature for patients of all ages, especially those with obesity, mental health problems or chronic disorders like hypertension and type 2 diabetes (Ducharme 2019).

10 Conclusion: Green and Happy Cities

In this section, we began by exploring the nature of a happy city and a sustainable city. These avenues of inquiry are important for understanding whether there exists conflict between sustainability and happiness. The answers demonstrate that the two profiles overlap. A city with public transport and bicycles, full of walkable, mixed-use neighbourhoods, abundant vegetation, spaces for sporting activity and pedestrian areas is both happy and sustainable. An urban project based on the quality of green spaces and public transport promotes relations, and therefore limits energy consumption. It is an environmentally non-aggressive project, because it is not aggressive towards humans. The happy city is sustainable, because it breaks the vicious circle of defensive growth. It is also an inclusive and participated city because improving the quality of what we have in common means democratising urban quality of life.

Happy and sustainable cities agree that private cars as an urban transport system is not ideal. Motor vehicles are very useful outside cities, but in cities they are only useful if shared, especially at night when public transport is limited or ceases. We have allowed ourselves to be poisoned by cars for decades before realising that much of the solution was a nineteenth century device called a bicycle. It is difficult not to see the enormous influence of the automobile industry behind a collective error of such proportions and duration.

The conclusion is that it is not necessary for us to give up anything to make our cities sustainable, we simply have to live in them better. The urban lifestyle that makes us unhappy is also very energy-intensive. The urban form prevalent today is a paradigm of defensive growth. This is why contemporary cities are both unhappy and unsustainable.

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