

‘It is impossible to effectively balance the needs of the economy, society and the environment in the contemporary world’.

Critically discuss this statement with reference to sustainability theory and practice.

Sustainable development is a concept, which since its origin, has caught the attention of both political and public minds alike. The concept highlights the idea that ensuring actions are taken in the present is essential to guaranteeing future generations live in a world which is not compromised (Pearce and Atkinson, 1998). This theoretical way of thinking has been established following a report by Gro Harlem Brundtland and the World Commission on Environment and Development (Purvis, Yong and Robinson, 2018; Brundtland, 1987).

The Brundtland report provided a useful and popular framework concerning the issue of sustainability, from this report the real debate concerning sustainability began (Brundtland, 1987). This report advocated for the vitality of a shift in paradigm concerning preservation and sustainability. Brundtland understood that the environment, society and economics must be prioritised and balanced for sustainable development to occur (Pearce and Atkinson, 1998; Brundtland, 1987). The Brundtland report is responsible for a variety of models of sustainability being established, one of these being the three pillars of sustainability (TTPS) (Pearce and Atkinson, 1998).

The theory of TTPS suggest that an integrated approach is necessary when dealing with sustainability (Purvis, Yong and Robinson, 2018). This means, each element should be considered with equal precedence and should not be contemplated in isolation (Giddings, Hopwood and Brien, 2002).

The European Environment Agency (EEA) (2019, (a)) understand that the condition of the environment is a key contributor to physical and mental health and to ensuring a clean environment, both essential factors in ensuring positive health and wellbeing. In contrast poor environmental conditions can have negative effect on one’s health (EEA, 2019 (a)). Air pollution is the term given for small and harmful particles such as sulphur dioxide (SO₂) ozone (O₃), carbon monoxide (CO) and nitrogen dioxide (NO₂) in the air (UK Air, N/D (a)). Such particles are known to have detrimental effects on the natural environment, effecting components such as soil, water and air, as well as being contributing factors to more extreme environmental problems such as climate change, acid rain and global warming (Manisalidis *et al*, 2020). Public Health also understand poor air quality to be the UK’s largest environmental

risk to public health, impacting on thirty-six thousand premature deaths yearly (Public Health South Tees (PHST), 2019). Therefore, this essay aims to use TTPS as a model to determine whether - while focussing on the air pollution issue in the North Eastern region of England (NEE) – it is possible to balance the needs of the environment, economy and society.

On a macro scale, historically, air pollution in the UK has primarily been the result of sulphur dioxide emission due to combustion of fossil fuels for industrial functions (Bronfenbrenner, 1979; UK Air, N/D). However, UK Air (N/D(a)) explain, emissions from petrol and diesel fuelled vehicles pose the biggest threat to clean air in the contemporary world, particularly in urban communities. Although over time, areas which were polluted due to industry do seem to be improving, emissions from traffic appear to be counteracting this process, and traffic pollution is worsening throughout the UK and across the globe (Air UK, N/D). On a more micro scale, NEE is affected severely both by the legacy of industrial pollution, and by contemporary pollutants (Pless-Mulloli, 1998; Bronfenbrenner, 1978). NEE has historically been reliant on traditional industry such as coal mining, ship building, steel production and oil and chemical industries as their main means of economy up until the late twentieth century which has left significant repercussions in terms of air quality in the region (European Commission (EC), N/D).

The most pressing contributor to air pollution in the contemporary world is vehicle emissions and engines with ineffective environmental regulations and performance (Khalid *et al*, 2020). Consequently, roadsides make up some of the most polluted zones in towns and cities alike across NEE and the UK (Khalid *et al*, 2020; Department for Environment Food & Rural Affairs (DEFRA), 2017). Furthermore, roadside emissions are the only air quality limit that the country is failing to meet (DEFRA, 2017). Prominent levels of such pollutants in vehicle exhausts emissions are toxic for its surroundings and damaging to both animal and human communities, thus creating increased pressure on both the economy and environmental and public health (Khalid *et al*, 2020).

Nitrogen dioxide gas (NO₂) is the most prominent of urban air pollutions. In the contemporary world it is a social norm for most adults in the UK to own and drive their own vehicle, over recent decades levels of NO₂ have increased because of this. Legal limits of NO₂ in Europe and the UK is 40 µg/m³ annually, meaning, forty micrograms of NO₂ per cubic metre of air (DEFRA, 2017). The UK government have failed to meet this target since 2010. (Taskforce for Lung Health (TLH), N/D).

For this reason, both national and local governments are devising strategies to reduce roadside emissions. For example, in line with the national Air Quality Plan 2017, Newcastle local government, in their efforts to comply with legal limits of NO₂, have established policies which focus on reducing emissions, particularly at the roadside to legal limits by 2021. These policies promote ideas such as sustainable transport, focussing on promoting clean, efficient and sustainable means of public transport and establishment of improved walking and cycle routes. In hope that the number of vehicles on the road are reduced, furthermore, reducing harmful emissions (Newcastle.Gov, 2018). Similar plans have been established by Middlesbrough and Gateshead Councils (Gateshead Council, 2020; Middlesbrough Council, 2020). With poor air quality being responsible for hundreds of deaths in Newcastle yearly, it would be assumed all areas of society would be ensuring everything is done to reduce roadside emissions (Newcastle Government, 2018). However, currently in 2020, Newcastle NO₂ air pollution exceeds national limit at 47.65µg/m³, Gateshead at 54.49µg/m³ and Middlesbrough at 54.58µg/m³, these figures give little hope that targets will be met by 2021 (TLH, N/D).

TLH (N/D) assume that little progress is being achieved due to lack of cohesion between national and local government regarding the preferred method of prevention and because of lack of central funding for local governments to pay for enforcing air quality zones, or to pay for schemes which support individuals switching to cleaner vehicles (TLH, N/D). It appears until local governments receive adequate funding to support such objectives little progress will be achieved (DEFRA, 2017; TLH, N/D).

It is also notable however, that at individual level (Bronfenbrenner, 1979), instant gratification plays a significant part in this, as until individuals and societies are unwilling to refrain from their quick fix environmentally damaging ways of life, especially in countries such as the UK which adopted a deep seeded 'we want it now' attitude (Cairns, 2002 *cited in* Hansa, 2009). For example, individuals usually understand that driving a car every day to work, instead of using more sustainable methods of public transport is damaging for air quality, however they still proceed with them as they're 'easier' (Arbuthnott, 2010). It appears until this attitude is overturned, it is unlikely, even in conjunction with policy, that change will occur on a macro scale (Cairns, 2002 *cited in* Hansa, 2009; Bronfenbrenner, 1979). This is despite the threat that air pollution poses on public health, especially in NEE (UK.GOV, 2018), the next section of this essay aims to address this, and the effect in which the issue poses to society.

Environmental inequality explains that marginalised groups and vulnerable societies are more susceptible to environmental risk, particularly air pollution (Williams *et al*, 2018). This is despite the fact, that wealthier individuals have a higher carbon footprint than the poor and that those with only one percent higher income produce a substantially higher level of harmful emissions (Costanza *et al*, 2020). Additionally, individuals and groups who experience socioeconomic deprivations are more vulnerable to the health conditions often associated with air pollution, for example: lung cancer, respiratory diseases, heart disease and at higher risk of mortality (Williams *et al*, 2018). A study of proximity to industrial pollution in Teesside explores this issue.

An investigation was undertaken by the Department of epidemiology and public health focussing on Teesside and Sunderland, both areas in NEE (Pless-Mulloli, 1998). Housing estates in Teesside which were in proximity to steel and chemical industries were analysed based on socio-economic factors, most experiencing deprivations and poor-income (Pless-Mulloli, 1998). Twenty-seven estates were separated into categories depending on their distance from such industries (Beynon, H *et al*, 1994 *cited in* Pless-Mulloli, 1998). Mortality from lung cancer was significantly higher than national average in all these areas, the mortality rate of men, higher than women. It was suggested this was because men were often employed in the industrial industries and so forth were more exposed to these dangerous pollutants (Lloyd *et al*, 1985).

Although this study is a few decades old, air pollution is still a contributing factor in more than one in twenty-six adult deaths in NNE (Enenkel, Quinio and Swinney, 2020). In addition, 'Middlesbrough is ranked 4th highest under 75 mortality rate for cardiovascular disease in England' and has the '6th highest under 75 mortality rate for respiratory disease in England' proving air pollution was then and is now a pressing environmental and health issue in the NEE, this emphasising the real extent of the problem (PHST, 2019).

The Health Foundation (THF) (2018) state that good health has a particular impact on both prosperity, wellbeing and overall quality of life. Suggesting, that in the absence of good health, barriers are established in relation to one's ability to thrive and prosper (THF, 2018). Social detriments of health such as economic stability, environment, education and living conditions are thought to have the greatest influence on one's physical health and the relationship between these socio- economic and health factors are multidirectional, and usually flow in a cycle (Marshall *et al*, 2018).

For example, in relation to the study, the participants health was put in jeopardy because of their environmental influences; in this instance, due to living in proximity to harmful pollution (Pless-Mulloli, 1998). However, if the individuals economic and social circumstances were different, they would be more likely to live in wealthier areas, posed with less environmental risk. Therefore, reducing prospect of developing health conditions related to pollution exposure (Pless-Mulloli, 1998; Marshall, *et al*, 2018).

GOV.UK (2018) understood that in 2017 the health and social care cost of air pollution was around forty-three million pounds, with respiratory and heart conditions responsible for the largest percentage of this cost. If action is not taken immediately it is estimated the cost of air pollution will rise to five point three billion by 2035 (GOV.UK, 2018). This research coincides with evidence which suggests that if even a small reduction in exposure to harmful emissions such as PM_{2.5} and NO₂ could be achieved, a significant reduction in cost to public health would moreover, be attained (GOV.UK, 2018). Thus, suggesting economic stability to be significantly important in both preventing and managing environmental and public health concerns (Yandle *et al*, 2004). The next section of this essay aims to explore this.

The environmental Kuznets curve theory suggests that economic growth is crucial to ensuring reduction of environmental degradation in the future (Yandle *et al*, 2004; Everett *et al*, 2010). Implying that environmental damage will be counteracted in the long term when economic growth is prioritised in the short term (Office for National Statistics (ONS), 2019 (a)).

The Department for Business Innovation & Skills (BIS) (2010) explain in order to create and sustain economic growth and consequently ensure environmental development in the future, it is essential to invest in jobs which assist global change such as technology and digital connectivity. In conjunction with this, prioritising infrastructure such as: housing including affordable social housing, small business, greener and more sustainable forms of energy such as solar and wind power, greener public transport, and better communication links is thought to be essential (BIS, 2010; HM Government, 2017). Government are currently prioritising and investing in infrastructure, this investment estimated to cost around five hundred billion (Infrastructure and Projects Authority, 2016). On a macro scale (Bronfenbrenner, 1979), nationally it is important to priorities such issues as this, as they promote all three pillars of sustainability (Pearce and Atkinson, 1998).

The necessity for a clean natural environment can support the economy by providing a variety of new and established employment (Everett *et al*, 2010). Conversely, patterns of globalisation

and pressure on business and industries to achieve greening goals, can be extremely destructive on traditional employment sectors (Hodgson and Charles, 2006). Built in Obsolescence theory would suggest that as technology advancements occur, change in employment sectors is inevitable as technology is efficient enough to carry out the work (Wieser, 2016).

On a Micro Scale (Bronfenbrenner, 1979) in NNE, patterns of globalisation and reduction in demand for unsustainable products which contribute to pollution, has been responsible for a rapid decline in traditional industries in recent decades. Industries such as coal mining, ship building, steel production and oil refining subsequently have suffered and employment in these areas have been taken over by productivity and technology (Kunapatarawong and Martínez, 2016). Consequently, decline in industries was responsible for one hundred and ten thousand job losses across the region between 1981 and 1997, this had substantial effect at a local scale for individuals who became unemployed and at a wider level to the overall economy in the region (EC, N/D; Hodgson and Charles, 2006). It appears, decline in industry left a legacy on the region, both in regard to pollution and to employment, as the NEE region has had the highest unemployment rate in the UK for the past ten years (ONS, 2019). Moreover, in relation to TTPS, decline in industry had negative effect on the societal and economic pillars but positive impact on the environmental pillar due to reduction in harmful emissions (Pless-Mullooli, 1998).

Conclusively, in the case of NEE, and the air pollution challenge they are posed with it appears impossible to balance the needs of the environment, society and the economy in reference to TTPS (Purvis, Yong and Robinson, 2018). It appeared in times where the economic pillar was prioritised and NEE was experiencing periods of economic growth, high employment rates and prosperity due to heavy industry; the environmental pillar was significantly compromised in terms of air quality and environmental security (EC, N/D). Reduction in such industries, although they have had influence in reduction in harmful pollutants in the air in NEE, have nonetheless resulted in legacies of poor air quality and poor health trends for future generations, particularly in relation to respiratory conditions (Pless-Mullooli, 1998). Considering this, it appears no enigma that the region have been struggling with a crisis of unemployment in recent decades (ONS, 2019).

The societal legacies created regarding health conditions caused by long-term exposure to air pollution also appear to create barriers to achieving economic growth (THF, 2018). The complex multi-directional relationship between physical health and socioeconomic factors, for example - improvements in physical health in individuals in NEE could result in higher

academic attainment, well paid jobs and ultimately higher levels of wellbeing and life satisfaction (GOV.UK, 2018) – this emphasises how important it is to reduce pollutants such as NO₂ and PM_{2.5} in order to achieve sustainable development for individuals and society in NEE (PHST, 2019).

One apparent solution in balancing the pillars would be to prioritise investing in infrastructure in NEE. Doing this successfully, should result in enriching and creating employment opportunities, with more sustainable means of travel to get to such jobs while reducing levels of air pollution. Therefore, assisting balancing economy, society and the environment in relation to TTPS (BIS, 2010; Purvis, Yong and Robinson, 2018).

Another important consideration would be, better establishment of policies which recognise that the rich contribute more to air pollution, while individuals from poorer socioeconomic positions pay the price for it. Implying that, if policies to reduce air pollution are fair, they must consider who the contributor is, who it is that suffers, and try to understand what can be done to close the gap between the both (Costanza *et al*, 2020).

Ultimately, In order to achieve any of this a shift in paradigm in public attitude toward sustainability must occur, regarding instant gratification, society must be willing to make conscious changes, particularly in preferred method of transport in order to reduce air pollution and maintain improved quality of life (Cairns, 2002 *cited in* Hansa, 2009).

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