Sustainability Matters: Guiding Principles for Sustainability in Occupational Therapy Practice, Education and Scholarship

WFOT

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OPENING QUOTE

Take a weekend camping trip, and you will notice that nature has a way of taking care of itself. Plants, trees and animals use the natural resources of their surroundings to meet their needs, yet never take more than what is required for their survival. You will also notice that wastes, such as fallen leaves, decaying plants and even animal droppings, are all recycled back into the environment to enhance and perpetuate future life. Nature does pretty well when it's left alone. Unfortunately, we see that humans have a way of meddling in the affairs of the natural environment.

(Rebecca Gillaspy, University of Phoenix and Ashford University)

FOREWORD

According to *The World Report on Disability* (WHO, 2011), 15 % of the world's population or, 1 billion people have a disability. Of those 1 billion, 110-190 million people have significant functional deficits. These statistics have a direct bearing on the World Federation of Occupational Therapists' (WFOT) agenda which is directly driven by the UN through WHO. Consistent with this agenda, the WFOT has set Sustainable Development Goals which inform the universal human rights agenda.

In the last 15 years WFOT has spearheaded a major shift in the focus of practice from the medical model of health to also encompass social model, from health of the individual to encompass population health, from institutionally based practice to community based practice and beyond. The Federation has expanded its focus on the realms of practice to embrace for example:

- Capacity Building
- Community Based Rehabilitation
- Social Entrepreneurship
- Human Rights
- Disaster Preparedness and Response

Now we are adding Sustainable Occupational Therapy Practice to the above list. Occupational therapy contributes to the global health of society and individuals by enabling pursuit of the right to engage in meaningful, purposeful occupations, irrespective of medical diagnosis, social stigma or prejudice. Global health should be central to occupational therapy practice, education and research. However if we are to be truly focused on global health of citizens, then our focus must also be on sustainability – environmental, social and economic.

The WFOT (2014) supports the belief that occupational therapists are international professional citizens, as it is encapsulated in the following statement:

> *As the world is now our backyard, the knowledge, skills and attitudes of the occupational therapy profession are coloured and shaped by diverse transcultural exposure, a oneness with humanity and fairness.*
>
> *Interconnectedness with the world promotes a desire to make decisions that will create a better place through engagement in occupations.*

The WFOT (2004) formally recognised the concepts of occupational apartheid, occupational deprivation, and occupational justice in its position statement on Community Based Rehabilitation. Further development of this agenda has been driven largely by the body of knowledge developed in occupational science. This body of knowledge suggests that occupational therapists have the knowledge and skills to support persons who experience limitations or barriers to participation in occupation. They also have a role and responsibility to develop and synthesise knowledge to support participation; to identify and raise issues of occupational barriers and injustices; and to work with groups, communities and societies to enhance participation in occupation for all persons. Achieving this agenda is to achieve an occupationally just society (WFOT, 2006)

However it is not sufficient for us to sit on our laurels. The WHO (2008) **Commission on the social determinants of health** tells us that "*Social injustice is killing people on a grand scale. Achieving health equity within a generation is achievable, it is the right thing to do, and now is the right time to do it*" and I believe occupational therapists are the right people to be involved.

Occupational therapists are increasingly being involved in areas of practice which are underpinned by the concept of social justice. Working directly with communities on projects that are meaningful to each community, having influence on local and health policy makers, and working with non-government organisations (NGOs) positions occupational therapists in a position to have a unique contribution to the goals of a civil society – one of which must be sustainability. Occupational therapists need to understand the vital role they play in what makes populations healthy truly equitable and accessible. What business entrepreneurs are to the economy, social entrepreneurs are to social change. They are the driven, creative individuals who question the status quo, exploit new opportunities and refuse to give up in their attempts to make the world better. WFOT supports this social contract.

However, while we may feel pleased with ourselves, if we are to grow and develop as a profession we need to keep pushing ourselves and it is through publications such as this one that we can achieve this goal. This group of authors have pushed the boundaries, issuing a call to arms to occupational therapy to live up to the social agenda. We need to be mature enough to critically appraise our work so that we can continue to grow and change and live what it is that we espouse.

While I write this foreword in my official capacity as the President of WFOT I am also (in my day job) a clinician. As a clinician I need to know that my practice is supported with robust evidence, solid research and forward thinking academics. I need to be reassured that my practice is the best that it can be and that the people I work with receive the maximum benefit from all I have to offer. So, in closing, I would like to say I absolutely commend this work and applaud my colleagues who have been involved in its development as makers of our future. It supports us as we strive to take our rightful place as agents of social change and equity.

Marilyn Pattison, Dip.COT(UK), B.App.Sc(OT), MBA, FWFOT

President, WFOT

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CONTENTS **PAGE**

Definition of terms:

Climate change: The climate has always been changing for geophysical reasons unconnected to human activity. However, with the invention of the steam engine followed by accelerated use of fossil fuels beginning in the 1800s, there has been unprecedented *anthropogenic* (i.e., human-caused) global warming, which is defined as "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods" (UN Framework Convention on Climate change – article 1)

Occupation: Occupation refers to "everything people do during the course of everyday life" including their activities as individuals, families, and communities in order to occupy time and live meaningful lives (World Federation of Occupational Therapists [WFOT], 2013a, p. 11).

Occupational Behaviour: Is defined as discrete actions that lead to accomplishment of tasks that together constitute peoples' occupations as defined above.

Occupational Ecology: Refers to the "awareness of the ecological genocide we are confronting, along with proactive measures, through human occupation, to restore balance with the natural environment" (Simó Algado & Cardona, 2005, p. 346).

Occupational Justice: Is the "the human need for, and right to be engaged in meaningful, satisfying and ecologically sustainable occupations" (COT, 2002, p. 36)

Occupational Lifestyle: The way people choose occupations every day and pattern a repertoire of occupations over a significant period of time in their lives (Ikiugu & Rosso, 2006).

Sustainable development: Is defined by the United Nations as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on Environment and Development, 1987, p. 43).

Sustainable lifestyle: A lifestyle that entails the ability of human beings to meet their current needs "without compromising the ability of future generations to meet their own needs" (Bojo et al., 1992, cited in Sathaye et al., 2007, p. 695). (World Commission on Environment and Development, 1987, p.43).

Prologue

In 1974, a little boy from a small rural village on the slopes of Mt. Kenya who had grown up poor but well insulated from the full-blown effects of poverty on his life, realized for the first time how vulnerable he really was. Up to that point in his life, the weather had been reliable. During the rainy season, it rained, crops grew, animals had plenty to eat and were healthy, and there was much to eat. Even though he had no decent clothes to wear, and his accommodation was deplorable by modern Western standards, he never wanted for anything in terms of life sustaining food and water. Suddenly, all that changed. For a whole year, there was no rain. Like the adults in his life, he got into the habit of constantly scanning the skies for any sign of the life-giving drops of water, but they never came. Clouds would form, but the promise of rain would disappear with their inevitable dissipation. The soil dried up, and for the first time, he knew what hunger was. He and his family would often go to bed hungry. That was the first of the many severe droughts that would subsequently ravage the region every few years with increasing frequency. Right now no one knows what to expect in terms of weather any more.

Like many people, this little boy did not understand what was happening to his world. Not until later in his education when he studied climate science and was suddenly able to connect the dots and find a coherent explanation of what was really happening. For this boy (now a middle-aged man) and many others like him, climate change is not an academic debate but a real threat to millions of people. He appreciates the effects of human activity (occupational performance) on the environment and ecological health on the one hand, and the effect that a degraded environment and ecosystem can have on human health and ability to live meaningful lives through occupational performance on the other hand. To elaborate further, according to the Intergovernmental Panel on Climate Change [IPCC] (2014), human activities have caused a rise in global surface temperature by 0.8 degrees Celsius, a rise of about 0.6 degrees happening within the last three decades leading to:

- Decreased water availability
- Decreased food security
- Decreased biodiversity
- Loss of livelihoods for thousands (or even millions) of people who depend solely on subsistence farming for survival (World Wildlife Fund [WWF], 2006).

In the Northern hemisphere, including the United States of America (US), the effect of climate change so far has been an increase in:

- The number of extreme weather events causing at least US$1 billion in damage yearly (Peterson, Hoerling, Stott, & Herring, 2013; Weiss, Weidman, & Pinkalla, 2013)
- Dangerous and costly wildfires, droughts, and heatwaves that have caused human suffering and billions of dollars in damage (Weiss & Weidman, 2013)

The impact of climate change resulting from unsustainable lifestyles on humanity was well articulated by Pan Yue, Vice President for China's State Environmental Protection Agency (SEPA) who stated:

> We are using too many raw materials to sustain [our] growth ... Our raw materials are scarce, we don't have enough land, and our population is constantly growing. Currently there [are] 1.3 billion people living in China, that's twice as many as 50 years ago. In 2020 there will be 1.5 billion ... but desert areas are expanding at the same time; habitable and usable land has been halved over the past 50 years ... Acid rain is falling on one third of Chinese territory, half of the water in our seven largest rivers is completely useless, while one fourth of our citizens do not have access to clean drinking water. One third of the urban population is breathing polluted air, and less than 20 percent of the trash in cities is treated and processed in an environmentally sustainable manner ... Because air and water are polluted, we are losing between 8 and 15 percent of our gross domestic product. And that doesn't include the costs

> for health ... In Beijing alone, 70 to 80 percent of all deadly cancer cases are related to the environment. (Smith, 2015, Para. 14)

It is therefore clear that urgent action is needed to correct the situation. The most sensible strategies going forward should include:

1. Reducing the human carbon footprint by managing consumption and switching from reliance on fossil fuels to renewable sources of energy
2. Strengthening communities so that they can respond to climate change
3. Helping those who are affected by the problem to adapt

1. RATIONALE FOR THE DOCUMENT

Sustainable healthcare is delivered by using resources in a way that doesn't compromise the health of present or future generations (Stancliffe, 2014). The global objective is to provide 'Health care without harm' (Health Care Without Harm, 2017). This objective challenges occupational therapy practitioners to provide services and to enable people to meet their occupational needs in the most sustainable manner. This is a moral imperative and in some countries a legal requirement. In the UK's Climate Change Act for example (UK Parliament, 2008), health care practitioners are required to incorporate sustainability in their practice. Unfortunately, occupational therapists are unwittingly practicing in unsustainable ways by mirroring the normal workings of societies that contribute more widely to global climate change, which has been described as "the biggest global health threat of this century" (UCL-Lancet Commission, 2009 p. 693). According to the Lancet Commission on Health (2015):

> The implications of climate change for a global population of 9 billion people threatens to undermine the last half century of gains in development and global health. The direct effects of climate change include increased heat stress, floods, drought, and increased frequency of intense storms, with the indirect threatening of population health through adverse changes in air pollution, the spread of disease vectors, food insecurity and under-nutrition, displacement, and mental ill health. (p.1861)

Often, discussion of climate change resulting from human activity occurs as an academic discourse, as if it were divorced from or even irrelevant to the lives of individual human beings. The above quote and the opening story in the prologue illustrate the real human cost of climate change. That is why the World Health Organization (WHO, 2003) recognized that climate change cannot be separated from human health and well-being:

> Our increasing understanding of climate change is transforming how we view the boundaries and determinants of human health. While our personal health may seem to relate mostly to prudent behaviour, heredity, occupation, local environmental exposures, and health-care access, sustained population health requires the life-supporting "services" of the biosphere. Populations of all animal species depend on supplies of food and water, freedom from excessive infectious disease, and the physical safety and comfort conferred by climatic stability. The world's climate system is fundamental to this life-support. (p. 6)

While discussing the connections among climate change, human occupation, health, and well-being as indicated by the Lancet commissions and WHO above, occupational therapy practitioners have increasingly recognized the possibility of including sustainability as part of the domain of concern for the profession. Wilcock (2006) argued for the need to consider the health of the ecosystem when trying to help individuals improve their health and well-being through engagement in meaningful occupations. It is also important to note that climate change and its consequences have a significant effect on peoples' ability to participate in occupations that they find meaningful. Addressing sustainability issues in occupational therapy is necessary in order to facilitate service users' social

and global wellbeing. The good news is that The Lancet Commission on Health and Climate Change (2015) also proposed that "tackling climate change could be the greatest global health opportunity of this century" (p. 1861).

In response to the global health opportunity as suggested by The Lancet, many occupational therapy and occupational science scholars have started conducting investigations aimed at clarifying the connections among climate change, human occupation, and health, and examining ways of mediating the problem of climate change while helping people adapt to its negative consequences. These efforts culminated in the formation of a project team to draft a position statement for the WFOT about environmental sustainability as it relates to occupational therapy practice (WFOT, 2012). Following the position statement, the WFOT made climate change and its effects on health a major area of its work and formulated the following four goals as the essential steps to help move humanity towards global sustainability:

- To create a society in which all people pursue personal occupational objectives in a sustainable manner.
- To ensure systems for health and social care delivery consider the essentials of processes, structure, policy and practice through a lens of sustainability.
- Through the Disaster Preparedness and Response project, to support service delivery and practice to meet immediate environmental needs of clients through environmentally sustainable practice and lifestyles.
- Recognition of the essential nature of education and research by making clear the need for: educational materials reflecting sustainability principles and examples; and, cross disciplinary and cross sectoral research partnerships." (WFOT, 2013b, p.1).

To address the above stated goals, WFOT has adopted the 17 United Nations (UN) Sustainable Development Goals (SDGs) (see fig. 1). There are many and varied ways of working towards the SDGs and the reader is encouraged to remain mindful of these goals while reading this guiding principles document. A Sustainable Development Assessment Tool has been developed for healthcare organisations, to evaluate progress in line with the UN SDGs. This in-depth tool features up to three SDGs for each of the 270 statements related to sustainable healthcare, the outcomes of which support the planning and evaluation of sustainability actions (Sustainable Development Unit, 2017).

The WFOT will track how occupational therapy activities support the UN SDGs, with programme and project plans including supporting activities that address specific goals, and informing the World Health Organization [WHO] about the progress (2017a). The WHO made climate change the focus of World Health Day in 2008 (WHO, 2008). The new director-general of WHO, Dr Tedros Adhanom Ghebreyesus, highlighted the health impacts of climate change and advocated for this issue with international leaders and heads of organisations at the 2017 G20 summit (WHO, 2017).

To advance the connections among occupational therapy activities, the UN SDGs, and the WHO objective to include climate change as a factor in health care, the WFOT published a position statement on environmental sustainability. After publication of the position statement, the WFOT sustainability project team embarked on development of the guiding principles for inclusion of Sustainability in occupational therapy education, practice, and scholarship, which led to the present document.

Fig. 1: The United Nations Sustainable Development Goals (UN, 2015)

1.1 Intention of the Document

This document is a resource developed by the WFOT to further the objective of supporting education, practice, and scholarship focusing on environmental/eco-sustainability, meaningful occupational participation, health and well-being. It pertains to issues of how occupational performance impacts and is in turn impacted by environmental problems arising from unsustainable collective human activity, and how impaired ability to pursue meaningful occupations due to resulting climate change may negatively affect human health and well-being. **The intention of the WFOT in this regard is to promote the idea of sustainability as relevant to human occupational performance, making it part of the occupational therapy scope of practice and scholarship.**

1.2 The aim

The aim of this document is to guide occupational therapy educators, practitioners, and professional organizations in discussing ways of making sustainability a part of occupational therapy education, practice, and scholarship. Using the five principles that are proposed in the document as a guide, occupational therapy educators, practitioners, and scholars can begin to support professional discussion about how to:

- Educate occupational therapy students regarding the interconnections among eco-sustainability, participation in occupations, health, and well-being, and how to work with;
  - Interested service users and communities to help them restructure their occupational participation so as to contribute towards mitigation of negative environmental consequences of unsustainability,
  - Individuals who are negatively affected by the consequences of eco-system damage due to unsustainability to help them explore ways of adapting and continuing to participate in personally meaningful occupations and staying healthy.
- Provide continuing education to help occupational therapy practitioners understand the connections among sustainability, participation in occupations, health and well-being, and the underlying ethical issues.

- Incorporate sustainability in daily occupational therapy practice by;
  - Practicing in ways that are as sustainable as possible,
  - Working with interested service users and communities to empower them so that they are able to participate in healthy, meaningful occupations that also contribute to mitigation of ecosystem damage,
  - Working with individuals who are negatively affected by ecosystem damage due to unsustainability to help them adapt to their context through occupation-based interventions.
- Conduct scholarship to inform occupational therapy's role in facilitating eco-sustainability and helping people who are affected by ecosystem damage due to unsustainability adapt so that they can continue to participate in meaningful occupations and to stay healthy.

Already, the WFOT has begun implementing some of the suggested measures through the recently launched Disaster Management Training Program for Occupational Therapy practitioners (McIness & Schaad, 2015). Some of the roles suggested for occupational therapy practitioners in disaster situations, such as those that may result from climate change include enabling "survivor participation in decision-making and activity" to facilitate "regaining control" which "is vital to recovery" through 'doing' and facilitating the ability of people to earn their "livelihoods" by accessing "small income generating activities, especially for vulnerable people" (p. 10). A WFOT Disaster Management learning module is available online (www.volunteerrus.wfot.org).

1.3 How the document was developed

In 2012, a group consisting of eight members (the WFOT project coordinator and seven content experts) was constituted. All members of the team were occupational therapists except one, who was an anthropologist and occupational scientist. Many of the team members considered themselves as both occupational therapists and occupational scientists (see team membership in Appendix A). Several of the team members had a record of scholarship and promotion of educational practices related to sustainability and therefore were considered experts on the subject.

The team began with the development of a Master Project Plan in which the objectives of the program and the program priorities that they addressed were identified. The project plan was modelled on previous WFOT projects which were used as templates (see for example, "Guiding Principles on Diversity and Culture", [WFOT, 2009]). An outline of the contents was developed by consensus, after which the topics were divided among the team members for development.

Each team member wrote the assigned document sections and circulated it to other team members for comment. Content was shared among team members on an ongoing basis through email. Skype meetings were held to discuss progress on the document. Through this process, several drafts of the document were produced culminating in a final document that was circulated to four readers with expertise on the topic for critical review and feedback. Two of the four readers responded, providing detailed feedback. Both readers were occupational therapists/scientists. The document was revised to incorporate the readers' feedback. The revised document was circulated to the WFOT member organizations for further feedback. Feedback was received from five member organizations. The review comments were incorporated into the final revised version before the document was published.

1.4 Structure of the document

Section 1 (see above) presents the introduction, purpose, and rationale for the document. Section 2 begins with an introduction in which the background information about the relationships among sustainability, occupation, health, and well-being are discussed to provide context to the principles. The question of why the notion of sustainable lifestyle is relevant to occupational therapy is discussed. The ethical implications of unsustainable lifestyles and their impact on peoples' health and ability to

pursue health-enhancing meaningful occupations are examined. Finally, the models of care through which sustainability can be operationalized for occupational therapy practice (enablement, empowerment, engagement, and rehabilitation) are outlined.

In section 3, five principles to guide incorporation of the sustainability topic in occupational therapy are introduced. These are:

- Understanding sustainability – An occupational therapy perspective
- The role of occupational therapy in contributing towards mitigation of environmental damage due to unsustainable lifestyles
- Helping occupational therapy service users adapt to environmental damage due to unsustainability
- Community sustainability in the face of environmental catastrophes
- Developing professional competence for administering occupation-based interventions to address sustainability issues

For each of the principles, the practice, educational, and scholarship implications are examined. Finally, the role of the WFOT and member national organizations in promoting integration of the sustainability topic into the fabric of professional practice, education, and scholarship is outlined. In section 4, brief backgrounds to the stated principles are presented. Finally, in section 5, a summary of recommendations to educators, clinicians, scholars, and national organizations arising from the principles is presented.

2. INTRODUCTION TO THE GUIDING PRINCIPLES

Almost twenty years ago Wilcock (1998) called for occupational therapists to recognize their responsibility in protecting the environment by encouraging ecological ways of living, for example through thoughtful occupational choice and engagement. Wilcock among others recognized that the environment is the crucible within which meaningful occupational participation can be nurtured. It would be meaningless to speak of meaningful occupation as a facilitator of health and well-being without being cognizant of the need to take care of the environment (the ecological context) that provides the resources and makes participation in meaningful occupations possible.

Consistent with the above argument, sustainability has recently been a key topic of inquiry for a number of occupational therapy and occupational science scholars (Dennis, Dorsey & Gitlow, 2015; Persson & Erlandsson, 2014; Wagman, 2014; Dickie, 2013; Hocking & Kroksmark, 2013; Aoyama, Hudson & Hoover, 2012; Hudson & Aoyama, 2008; Ikiugu, 2011, 2008; Whittaker, 2012; Rushford & Thomas, 2015a; Simo & Kapadnadze 2016) and organisations (Swedish Association of Occupational Therapists, 2013; WFOT, 2012; College of Occupational Therapists [COT], 2013) and is included in the British College of Occupational Therapy (COT) Code of Ethics (COT, 2015). This trend follows a wider global awareness of sustainability issues as they relate to the health professions and governmental organisations. Within these trends, it is recognized that climate change threatens the very ecological framework that not only sustains life but makes meaningful occupational participation and health possible. It is estimated that this problem will impact all populations (WHO, 2008). The gravity of climate change and all that it means has necessitated consideration of a legally binding treaty to cut carbon emissions in the United Kingdom by 80% by 2050 (UK Parliament, 2008) with the National Health Service, one of the biggest carbon emitters in Europe, playing its part (NHS Carbon Reduction Strategy – Sustainable Development Unit, 2009). Health professionals are responding to the crisis. An example of this response can be seen in the work of the sustainability networks at the Centre for Sustainable Healthcare (2017a), which includes the Occupational Therapy Sustainable Practice Network (www.sustainablehealthcare.org.uk/ot-susnet).

According to the Intergovernmental Panel on Climate Change [IPCC] (2013), climate change poses a disproportionate threat to the poorer segments of our society because of their limited capacity to adapt to the changes. Therefore, one of the roles of occupational therapists going forward will include helping disadvantaged individuals and communities to mobilize through goal-oriented occupational participation so as to adapt to changes in the environment and climate-induced environmental disasters (Rushford & Thomas, 2015b). The ensuing discussion points to the primary role of occupational therapy practitioners in empowering individuals and communities to adopt meaningful, sustainable, and adaptive occupational lifestyles that contribute positively not only to the personal but also to the environmental health. This would be a holistic approach to practice based on the notion that it is beneficial to help individuals recognize that: 1) they are not apart but rather are continuous with the environment (the ecosystem in which they exist) that supports them; 2) being healthy is dependent on one's environment being healthy as well; 3) what one does on a daily basis (occupational participation) affects one's environment and by extension, one's health; and 4) one has the power to change the environment/ecosystem positively through chosen participation in meaningful occupations, and in the process have a positive impact on one's health and the health of other beings supported by the ecosystem.

2.1 The concept of sustainable lifestyles

According to the World Commission on Environment and Development (1987), sustainable development is grounded on three pillars: economic development, social development, and environmental protection. This 'triple bottom line' of economic, social and environmental agendas needs to be fulfilled in order to meet the needs of current generations without negatively affecting the ability of future generations to meet their needs.

Since the global economic crisis of 2008, governmental austerity measures have impacted on the financial provision of healthcare services around the world. Economic restraints on occupational therapy services are often considered paramount and can guide clinical decisions over and above social and environmental factors. However, within the triple bottom line framework, the economic, social and environmental factors are completely interdependent. For example, improving patient and staff outcomes and saving carbon also saves money, as demonstrated in projects such as the 'Green Ward' competition (Centre for Sustainable Healthcare, 2017b). Another example of this interdependence can be found in the 'Improving Lives, Saving Money' campaign (Royal College of Occupational Therapists, 2017) which shows how occupational therapy brings combined social and economic benefits. The highlighted projects in this campaign also save carbon and reduce waste, and therefore meet the sustainable healthcare triple bottom line.

To venture more widely into the economic framework for global healthcare is beyond the scope of these guiding principles. Our focus is on occupational therapy practice, taking into account occupational lifestyles that both enhance health and preserve the environment (i.e. social and environmental sustainability). Due to the predominant focus on economic issues in many healthcare settings, these will herein be explored in relation to social and environmental sustainability.

Across societies, it is recognised that sustainable lifestyles are inextricably related to economic factors that depend on government and corporate policies. In other words, an individual's ability to live a sustainable life depends on structures that are available to facilitate participation in health promoting productive (e.g. work) and consumption (e.g., leisure) occupations in such a way that resources are not depleted or the environment degraded to such an extent as to deny future generations the ability to participate in similar occupations. For example, are there opportunities to find work close to one's residence so that driving is minimal, thus making it possible to reduce one's carbon footprint while pursuing the very important productive occupation of work? Are there clean

means of public transportation (such as high speed electrically powered trains) that a person can use for mobility while going to work or going shopping?

As such, barring a major transformation of social relations, all that can be asked of individuals is to strive to live the most sustainable occupational lifestyles possible given the constraints imposed by the political and economic contexts in which they live. Nevertheless, if we take the notion of Political Activities of Daily Living (pADLs) introduced by Kronenberg, Algado, and Pollard (2005) seriously, we can be in a position to empower people so that they assume agency in performance of their pADLs in such a way that they facilitate a change in political and economic systems locally. By "empowerment" in this case we mean working with occupational therapy service users collaboratively rather than prescriptively, in the process enabling them to fulfil their civic duties of making their voices heard in matters of policy about issues of priority for them (which is the very definition of pADLs).

Such empowerment is important because being healthy includes among other things being able to contribute to the creation of a supportive (healthy) environment. Occupational lifestyle change in this sense is a way of creating holistic health conditions where individuals and the contexts in which they live are in a sustainable harmony. In other words, for human beings to stay healthy, the health of the environmental context has to be maintained. Therefore, empowering people to change their occupational lifestyles so as to restore the ecological balance is also a way of restoring health for individuals and communities.

2.2 The need for an in-depth discussion of sustainability in occupational therapy

We are continually reminded of the changing climate, as natural disasters and extreme weather events occur more and more frequently all over the world. In addition, climate change has become accepted as more than a purely environmental issue; it is a fundamental threat to meaningful occupational performance and to overall human health.

In the position statement on environmental sustainability, the WFOT (2012) posited that *"it is vital that occupational therapists work, in their core role centring on occupation and occupational performance, towards environmental sustainability within the profession and collaboratively with clients and communities".* As actors within the health care sector, occupational therapy practitioners are responsible for advocating and raising awareness of the relationship between climate change and health (WHO, 2011). They need to consider this responsibility, but also to discuss and advocate for the profession's potential contribution to the establishment of sustainable societies, for the benefit of their service users. Today it is evident that human occupations involving use of fossil fuels or over-fertilization of land negatively affect the global climate as well as global health.

According to the WFOT (2010): "Occupational therapy is a client-centred health profession concerned with promoting health and wellbeing through occupation" (p. 1). Based on the above definition, occupational therapy practitioners have expertise to explain the interrelationships among human occupation, environment, and health. In the recent occupational therapy and occupational science literature, there is a sense of transition from an individual perspective on the person-environment-occupation relationship, to a broader focus on participation, empowerment, and justice (see, for example Townsend & Polatajko, 2007; Wilcock & Hocking, 2015). This seeming shift in paradigm provides occupational therapy and occupational science with a unique perspective that could be used to advance society's aspirations towards sustainable development. Occupational therapy practitioners and occupational scientists have competences that can benefit society by contributing towards mitigating the dangers of unsustainable lifestyles (Swedish Association of Occupational Therapists, 2013).

In a review of literature on how occupational therapy can contribute to ecological sustainability, Wagman (2014) concluded that there were four approaches; adapting, cooperating, exploring, and

warning. Through Wagman's and other scholars' work, the journey towards establishing the concept of sustainability within occupational therapy has started, but there is a need for further research in this topic. There is a need for an in-depth discussion of what sustainability means for occupational therapy. Further, as Hocking (2009) stated, more research is required to investigate the experience and knowledge of the occupation itself, taking into consideration sustainability and occupational justice issues. The guiding principles suggested in this document will contribute towards this beginning process of extending and deepening this discussion within the profession.

2.3 The relationship between sustainability and ethics

The four primary principles of bioethics that guide the practice of occupational therapy among other health care professions are beneficence, non-maleficence, autonomy, and justice (Beauchamp & Childress, 2012). **Beneficence** refers to the principle that a health care professional has a duty to do good for the service user (provide all possible beneficial interventions). **Non-maleficence** refers to the principle that a health care professional is obligated not only not to do harm to the service user, but to the extent possible to prevent such a person from being harmed. **Autonomy** is the principle that a service user has a right to accept or refuse any services freely and without coercion. Therefore, providing services is predicated on informed consent of the service user. Finally, **justice** refers, broadly speaking, to the principle that health-care research, benefits, and risks must be shared equally in society. In other words, a certain group of people cannot have access to all the benefits while another group bears all the risks of research and health care advances.

Since occupation refers to what humans do to occupy their time and the impact of their doing on others as an expression of becoming a person in society and belonging to communities, the question of sustainable occupations is very pertinent. Much environmental change is currently driven by human activities or occupations (Dennis, Dorsey, & Gitlow, 2015), and such environmental change has a direct impact on access to meaningful occupations and quality of life. Since occupation, and access to occupation, is a determinant of quality of life, it follows that through the impact on the environment, participation in occupations has consequences for other people in the present and in the future. The way resources are managed and used in pursuit of meaningful occupations in the present has implications for the access that others may have to them, now and in the future. The ethical principle of justice is directly applicable here because anything that impacts access to meaningful occupations and subsequently to health and well-being of a certain group of people imposes undue risks to such people (Block, Kasnitz, Nishida, & Pollard, 2015). This ethical problem is particularly pertinent because people living in poverty (and therefore significantly marginalized) are disproportionately affected by climate change. This means that ethically, managing the higher risks to the survival and meaningful life for people of limited financial means due to environmental damage has to involve addressing social inequality and alleviating poverty, in addition to finding ways of reversing damage to the environment.

Occupational therapy practitioners use concepts such as occupational ecology to contextualize the ethical considerations that might be applied in the use of the environment or the production of waste; occupational apartheid and occupational deprivation when examining situations where people are excluded or prevented from participating in meaningful occupations; occupational justice and occupational deprivation when examining access to meaningful occupations as a human right; and occupational choice when exploring the rights and ability of people to choose the way in which they participate in occupations (Kronenberg & Pollard, 2005; Townsend & Wilcock, 2004; Whiteford, 2004, 2000). In line with the above definitions of terms, to ensure occupational fairness to all humanity now and in the future, environmentally unsustainable occupational patterns, which can be cross-generational, need to be identified so that they can be changed in order to be consistent with a more sustainable future.

In summary, practicing with a consciousness about sustainability includes being cognizant of the ethic of 'leaving no one behind', of recognising human rights and values for everyone, and taking action to ensure that these rights are upheld (Orr, 2009). It includes an environmental ethic where full consideration is given to the potential consequences of human activity on the environment, and how these consequences impact occupational therapy service recipients' ability to pursue chosen meaningful occupations and therefore to stay healthy. The occupational component of a right to live well and in health is about the whole person being enabled to make choices and to experience a sense of belonging, and about managing human occupational impacts so that people can continue to enjoy these rights in the future (Dennis, Dorsey, & Gitlow, 2015; Ikiugu, 2008). It is therefore imperative that in promoting sustainable occupational lifestyles, attention be given to the effect of these choices on the biophysical environment.

2.4 Models of care

Models of care include specification of approaches to service design and delivery. Health care professionals involved in enablement, empowerment, participation, engagement and rehabilitation have a large part to play in contributing to the sustainability agenda using these models of care. In the 'Route Map for Sustainable Health' (Sustainable Development Unit, 2011, http://www.sduhealth.org.uk/policy-strategy/route-map/1-models-of-care.aspx), the vision for models of care by 2050 was postulated to include a situation "where health is less a medical matter and more about us having control over our own well-being". In other words, "having control over our well-being" is a core construct in occupational therapy and is consistent with the bioethical principle of autonomy (Beauchamp & Childress, 2012). Therefore, the "Route Map for Sustainable Health" seems to be consistent in philosophy to occupational therapy's aspirations. Six elements for transforming care to a more sustainable practice were suggested: living well, prevention and early intervention, enablement and support, self-management, acute and specialist rehabilitation, and dying well (Sustainable Development Unit, 2014). These elements are core occupational therapy constructs, highlighting how occupational therapists can lead the way in sustainable healthcare practice by using sustainable models of care.

Four pillars of sustainable clinical practice were proposed by Mortimer (2010), and were included in the College of Occupational Therapy (COT) briefing paper on sustainable development (COT, 2013). Again, the first two of these pillars are consistent with the core occupational therapy concepts. The following four pillars were adapted for a 'Consensus statement on sustainability in occupational therapy' at a COT sustainability event (full consensus statement in Smyth, 2015):

> "Sustainable occupational therapy practice will:
>
> 1. Continue to explore the social, economic, environmental and spiritual determinants of health as part of preventative healthcare approaches
> 2. Continue to empower and enable people to take control of their own wellbeing and their impact on communities
> 3. Eliminate wasteful activity
> 4. Make use of low carbon alternatives" (p. 31)

In the guiding principles, we will examine how the last three of the above listed parameters of sustainable occupational therapy practice can be operationalized.

The ensuing discussion suggests that sustainability is really about human empowerment so that human beings are agents who affect their own health through reflective occupational participation to support a healthy environment in which they exist. Such an approach to life requires recognition of the symbiosis between human beings as actors and the environmental context in which they act. If the environmental context becomes unhealthy due to human activity, human health is negatively affected,

and vice-versa. That is why Hocking and Kroksmark (2013) pointed out that there was a need to promote sustainable practices through occupational therapy intervention aimed at helping people develop healthier lifestyles. As such, Sustainability principles could be integrated into occupational therapy through expansion of the profession's paradigm to include a global approach, with both the local and global environment being considered within occupational therapy interventions (Whittaker 2012). For example, as part of the 'physical' environment as proposed in the Canadian Model of Occupational Performance and Engagement (Polatajko, Townsend, & Craik, 2007), the impact of occupational performance on the environment and the ecosystem, both locally and globally can be evaluated. Of course such interventions would need to be tailored to local conditions and needs.

3. GUIDING PRINCIPLES

Introduction

The guiding principles presented in this document provide suggestions about how to incorporate content about sustainability in occupational therapy education, practice, and scholarship. In developing the principles, we recognized that we are only a part of many professional and scientific disciplines involved in the investigation of how people can live sustainably. The objective in this interdisciplinary inquiry is to increase understanding of the subject in order to chart an informed, healthy course for human beings as they hopefully change behaviour in order to ensure that the current generation does not threaten the survival and quality of life for future generations (World Commission on Environment and Development, 1987).

In developing the principles, the vision was that occupational therapy could join this interdisciplinary effort to promote behaviour change in the direction of healthy, sustainable living through reflective occupational choices. Since occupational therapy practitioners are the professionals who are best equipped with knowledge about motivation for occupational choice and occupational performance, they are in a position to contribute meaningfully to helping people individually and in communities choose occupations judiciously in order to act in such a way that they can participate in health enhancing meaningful occupations without jeopardizing the ability of future generations to survive and to pursue their own meaningful occupations.

This proposition calls for exploration of a new emerging practice specialty in occupational therapy where practitioners work with members of the general population to encourage occupational behaviours with the co-benefits of health enhancement and promotion of sustainability. A series of papers exploring public health co-benefits of health and low carbon lifestyles were published by *The Lancet* (Watts, 2009). For example, walking and cycling instead of using motorised transport would address carbon targets, improve air quality, and reduce the occurrence of cardiovascular diseases, depression, obesity and dementia. Another example is the impact of eating habits on both the environment and health. Four-fifths of greenhouse gas emissions in the food production sector come from livestock farming. Reducing meat and dairy intake in our diets could lead to a decrease in cardiovascular diseases, obesity and cancer, while helping mitigate climate change.

There are occupational therapists who are already exploring the health co-benefits of sustainable lifestyles. Some are for example engaged in developing gardening projects (THRIVE.org) in many UK communities. They help people figure out how to use urban spaces or allotments for food production, so that they learn how to grow their own food. By growing their own food, individuals can reduce demand for food products from shops, thus reducing pressure on environmentally pernicious transportation of food through the supply chains while proactively making available fresh foods, and thus improving diet and health. Occupational therapy practitioners can also work with community organisations as partners to help people learn how to repair domestic appliances rather that replacing them with new ones in order to reduce consumption. This approach to reducing

consumption would also help people develop occupational skills and purpose, while saving resources and reducing manufacturing processes that may contribute to harming the environment. These are just a couple of examples to illustrate how occupation-based interventions can be used to promote sustainability.

The principles in this document are designed to guide occupational therapy educators, practitioners, scholars, and professional associations in facilitating discussion about inclusion of the sustainability topic in occupational therapy education, practice, and scholarship as discussed above. In this regard, five principles are hereby suggested:

- Understanding sustainability – An occupational therapy perspective
- The role of occupational therapy in contributing towards mitigation of environmental damage due to unsustainable lifestyles
- Helping occupational therapy service users adapt to the consequences of environmental damage due to unsustainability
- Community sustainability in the face of environmental catastrophes
- Developing professional competence for administering occupation-based interventions to address sustainability issues

The background information for the principles is provided in section 4. Sections 3 and 4 are therefore meant to be read together. The following questions can be used by occupational therapy educators, practitioners, and scholars to guide reflection on sustainability in general:

- What is my government doing about climate change and sustainability?
- What legislation exists to support my contribution to sustainability?
- What can I do as an occupational therapy practitioner to promote my own and other peoples' sustainable practice?

In addition, each principle is followed by more specific questions to guide further reflection and discussion of pertinent issues on the topic.

3.1 Principle 1: Understanding sustainability - An occupational therapy perspective

Occupational therapy practitioners shall be encouraged to educate themselves about issues of ecosystem sustainability as it impacts ability to pursue chosen meaningful occupations and subsequently human health and well-being. Sustainability refers to the ability of human beings to live and thrive without threatening the ability of future generations to similarly live and thrive. This is possible if humanity does not exhaust available resources or degrade the environment to the point where the planet cannot support a dignified survival of humanity. For occupational therapy, sustainability can be understood as the ability to choose and participate in healthy, meaningful occupations without threatening: 1) availability of resources to enable other people to participate in their own meaningful occupations in the present and in the future; and 2) the ability of future generations to pursue similar occupations. This means that:

Occupational therapists need to be:

- Knowledgeable about the meaning of the principle of sustainability in general and the meaning of sustainable occupational participation in particular
- Knowledgeable about the relationship between occupational lifestyle and sustainability
- Able to determine individual, cultural, and contextual factors that lead to unhealthy and/or unsustainable occupational lifestyles
- Understand the public health co-benefits of low carbon lifestyles
- Able to use their professional skills to guide individuals and communities in making occupational behaviour choices that lead to healthy, sustainable lifestyles

Educators need to think about how to educate occupational therapy students about:

- The relationship between human occupational behaviour and sustainability
- Health impacts of climate change due to unsustainable occupational lifestyles
- Intervention skills to help individuals and communities change occupational behaviour so as to live healthy and/or sustainable lifestyles within their environments
- How to do scholarship to build the body of knowledge on healthy, sustainable occupational behaviour

Occupational therapy scholars need to investigate:

- Methods of contributing meaningfully towards expanding the body of knowledge about human occupational behaviour and its relationship to sustainability
- Ways of using knowledge about the relationship between occupational performance and sustainability to contribute to the development of policies that ensure sustainable occupational lifestyles

Occupational therapy organizations and the World Federation of Occupational Therapists:

- Support scholarship geared towards generating evidence about the relationships among occupation, sustainability, and health
- Promote evidence-based, occupation-based interventions to facilitate individual and community occupational lifestyle changes to support community health and environmental sustainability

3.1.1 Reflective questions

The following questions are designed to help users of this document examine closely their understanding of the topic of sustainability so that they know their learning needs in order to improve their competency in integrating sustainability in their professional practice.

For occupational therapists practitioners:

- On a scale from 1 to 10, with 1="no knowledge" and 10="fully knowledgeable", how would you rate your current knowledge of: the meaning of sustainability as it applies to the ecological systems; its relationship to human occupational performance; and its relationship to human health and well-being?
- What is your perception of how occupational lifestyle affects environmental sustainability?
- How do cultural and social contexts affect peoples' ability to perform meaningful occupations sustainably?
- On a scale from 1 to 10, with 1= "no skills" and 10= "highly skilled", how would you rate your skills in working with individuals and communities to help them choose healthy, sustainable occupational lifestyles?
- What skills do you need to learn at this point to help you work more successfully with individuals and communities to help them reflect about sustainability of their actions as they choose and participate in meaningful occupations?
- What skills do you need to learn that would help you work successfully with individuals and communities to help them adapt to the negative consequences of climate change using occupation-based strategies?

For Occupational Therapy Educators:

- On a scale from 1 to 10 with 1= "no knowledge" and 10= "very knowledgeable", how would you rate your knowledge of the topic of
  - Sustainability;
  - The relationships among sustainability, meaningful occupational

performance, and health;
- The relationships among sustainability, health, and well-being?

- What could you do to improve your knowledge of the sustainability subject and its relationship to meaningful occupational performance, health, and well-being?
- What strategies could you use to help your students develop knowledge about sustainability and its relationship to meaningful occupational performance, health, and well-being, and use that knowledge to develop skills necessary to work with people individually and in small communities to help them:
  1) think about sustainability of their actions as they choose and participate in occupations; and
  2) adapt to negative consequences of climate change and ecosystem damage?

For Occupational Therapy Scholars:

- To what extent have you considered including questions about sustainability as it relates to occupational performance, health, and well-being in your scholarly agenda?
- If you were to include sustainability in your scholarly agenda, how would you go about doing it?

For WFOT and national associations:

What do you think may be the association's role in facilitating integration of the topic of sustainability as it relates to occupational performance, human health, and well-being in the occupational therapy profession (please, think of the specific strategies that you would use to achieve this goal)?

3.2 Principle 2: The role of occupational therapy in Contributing towards mitigation of environmental damage due to unsustainable lifestyles

Occupational therapy practitioners shall work with interested service users and communities to help them explore ways of participating in healthy, meaningful occupations in such a way that they contribute towards mitigation of environmental damage due to unsustainable lifestyles.

According to the International Panel on Climate Change (IPCC, 2013), irrespective of what we do at this point, climate change will continue through the 21st century and beyond. However, the change can be mitigated to avoid the worst case scenario by taking measures to keep continued accumulation of greenhouse gasses in the atmosphere to a minimum. Consistent with this recommendation by the IPCC, the WFOT (2015) has expressed a commitment to encouraging occupational therapy practitioners to "provide interventions targeted at climate related risks". For occupational therapy practitioners, targeting "climate related risks" may be achieved through occupation-based mitigation efforts to limit deleterious accumulation of greenhouse gasses into the atmosphere through occupational lifestyles. This means that:

Occupational therapy practitioners:

- Become aware of their role in reducing the carbon foot-print within their own practice settings
- Work actively with service users [1]**who express a desire** to reduce their carbon footprint to help them develop healthy, sustainable occupational lifestyles

[1] We would like to point out that as occupational therapy practitioners, we cannot impose our views about sustainability on service users. That would be unethical. Our role is to make them aware of the facts about occupational performance and its relationship to sustainability, and let them know that we are available if they want our guidance in exploring options for healthy occupational lifestyles that contribute to environmental sustainability.

- Include sustainability in activity analysis
- Expand their practice to include working with people in small communities to support them in their efforts to reduce their carbon footprint by developing healthy, sustainable occupational lifestyles

Occupational therapy educators help students:

- Develop skills necessary to analyse their practice settings and develop practice protocols geared towards contributing to reduction of the carbon footprint to a minimum
- Develop specific skills that are necessary for working competently with **interested individuals** and communities to help them develop healthy, sustainable occupational lifestyles
- Gain awareness of the ethical implications of unsustainable occupational lifestyles

Occupational therapy scholars:

- Engage in scholarship of discovery, integration, and translation leading to: 1) increased knowledge of the relationships among sustainability, occupational performance, health, and well-being; 2) translation of the accumulated knowledge and development of models of intervention to help people individually and in small communities learn how to develop healthy occupational lifestyles that contribute to environmental sustainability

WFOT and national associations:

- Set standards for education of students in order to help them develop skills to work with individuals who want to develop healthy occupational lifestyles that contribute to environmental sustainability
- Incorporate sustainability in their principles of ethics in order to make it clear that sustainability is not only a health but also an ethical issue
- Develop standards of practice that include sustainability as a core factor in occupational therapy practice

3.2.1 Reflective questions

The following questions are designed to help users of this document reflect on how they can contribute to the objective of helping humanity reduce its carbon footprint and therefore mitigate the problem of climate change and its effects on health and well-being.

For occupational therapy practitioners

- Roughly speaking, what do you think is your current carbon footprint within your practice setting?
- What could you do as an individual to help reduce the carbon footprint within your practice setting?
- How could you work with your **interested clients** to help them develop sustainable occupational lifestyles so as to decrease their own carbon footprints?
- How could you expand your scope of practice to include working with **interested individuals** and groups in the community to help them modify their occupational lifestyles in order to reduce their carbon footprints?

For occupational therapy educators

- What do you think is your carbon footprint within your educational setting?
- What could you do as an individual to help reduce the carbon footprint within your educational establishment?
- How could you help your students develop skills to assess their own occupational lifestyles and to modify them in order to reduce their carbon footprints?

- How could you help your students learn the skills necessary to work with **interested service users** to help them modify their occupational lifestyles in order to contribute towards mitigation of the problem of unsustainability?

For scholars

- How could you initiate scholarship that would contribute towards building a body of knowledge about how human occupation can be used to mitigate the problem of unsustainability and to improve human well-being?
- How could you develop scholarly priorities to investigate and generate evidence that supports occupational therapy practice to promote healthy, sustainable lifestyles through doing?

For WFOT and national associations

- What role could you play in setting standards for practice to promote sustainable occupational therapy practice and to expand the scope of practice to include facilitation of healthy, sustainable occupational performance?

What role could you play in facilitating research in order to build a body of knowledge about the relationships among sustainability, occupational performance, health, and well-being, and to apply this knowledge in occupational therapy practice?

3.3 Principle 3: Helping occupational therapy service users adapt to the consequences of environmental damage due to unsustainability

Occupational therapy practitioners shall be encouraged to work collaboratively with service users to help them adapt to deleterious and health-impacting effects of environmental degradation due to unsustainable lifestyles so that they can continue to participate in meaningful occupations in a sustainable manner. As mentioned earlier, climate change due to global warming has resulted in significant risks to humanity as whole, and severe risks to vulnerable sections of society in particular. According to the Intergovernmental Panel on Climate Change (IPCC) Working Group II (2014):

> Impacts of such climate-related extremes include alteration of ecosystems, disruption of food production and water supply, damage to infrastructure and settlements, morbidity and mortality, and consequences for mental health and human well-being. For countries at all levels of development, these impacts are consistent with a significant lack of preparedness for current climate variability in some sectors yields, or destruction of homes and indirectly through, for example, increased food prices and food insecurity. (pp. 6-8)

Recent events illustrate the above stated warning by the IPCC. On August 25, 2017, Harvey, a category 4 hurricane made landfall just North of Fort Alansas, Texas. The hurricane caused 71 deaths and large parts of the City of Houston and the state of Louisiana were completely flooded. Hundreds of thousands of people were rendered homeless and were living in shelters as of this writing. Even before Harvey dissipated, a new hurricane Irma formed in the Atlantic Ocean and very quickly reached category 5 strength with sustained winds of up to 185 miles per hour. It was classified as the strongest storm ever recorded in the Atlantic basin. The storm devastated the islands along its path including Barbuda where it destroyed 95% of the buildings and left half of the island population homeless. Ninety five per cent of the island of St. Martin was virtually destroyed and a similar story went for all the other islands on its path. In the US, the storm destroyed the Florida Keys and caused devastation in cities such as Jacksonville. The size of the hurricane was so enormous that it affected the entire Florida peninsula Coast to Coast. Similarly, in India, large swaths of the country have been devastated

by unusually severe monsoon storms, while in the East African region, an unprecedented protracted drought has been wreaking havoc.

Some scientists are reticent about connecting any of these specific historically devastating events to climate change. However, it is instructive that the IPCC (2014) predicted that with the warming of the oceans and atmosphere, these events (droughts, hurricanes, tornadoes, etc.) would become more frequent and more severe. This seems to be exactly what is happening. The issue for occupational therapy practitioners is that these events cause displacement of large groups of people, for all intents and purposes creating environmental refugees and/or displaced persons. That means that lives are disrupted and daily occupational routines are interrupted. Children stop going to school for extended periods of time, work and leisure activities that give life meaning are interrupted, etc. Given that these events are expected to increase in frequency and intensity in future, the question is, what is the role of occupational therapy in helping these displaced individuals, and those whose environment has so drastically changed that they cannot perform their typical meaningful occupations or maintain a semblance of normal, meaningful lifestyles? Increasingly, occupational therapy practitioners are recognizing the need for the profession to play its role in helping people adapt to the impacts of climate change as described above (Aoyama, Hudson, & Hoover, 2012; Hocking & Kroksmark, 2013; Ikiugu et al., 2015; Wagman, 2014; Whittaker, 2012). This means that:

Occupational therapy practitioners expand their scope of practice to include:

- Working with individuals and small groups in the community using occupation-based interventions to help them adapt to the negative consequences of climate change using the recently published "*Disaster and Development*" book (Rushford & Thomas, 2015a) and other resources as guides
- Using interventions based on Political Activities of Daily Living (pADLs) (Kronenberg, Algado, & Pollard, 2005) to empower individuals and communities to organize and advocate for themselves so that they can have better access to resources to enable them to adapt

Occupational therapy educators:

- Teach occupational therapy students skills that are necessary for working with people individually and in groups in the community using occupation-based interventions to help them adapt to the negative consequences of climate change
- Equip students with skills in pADLs that they can use to help people organize and advocate for themselves so that they have access to resources needed to adapt to the negative consequences of climate change

Occupational therapy scholars:

- Engage in scholarship of discovery, integration, and translation leading to development of effective occupation-based and pADL-based models of practice that can be used by occupational therapy practitioners to guide people individually and collectively in adapting to the negative consequences of climate change

The WFOT and national associations:

- Promote Inclusion of content about adaptation to the negative effects of climate change resulting from unsustainable human behaviour in occupational therapy practice, education, and scholarship
- Expand standards of practice to include working with individuals and groups in the community to help people adapt to the negative effects of climate change as part of the scope of practice for occupational therapists

3.3.1 Reflective questions

Helping people individually and in groups learn to adapt to the negative effects of climate change resulting from unsustainable human behaviour is one of the specialties of practice that occupational therapy practitioners should adopt going into the future. The following questions will help users of these guidelines reflect on how they can promote this occupational therapy specialty:

For occupational therapists:

- How can you develop an occupational therapy program to work with individuals and small groups to help people whose ability to earn a living, engage in leisure pursuits, take care of themselves, and engage in other meaningful occupations is threatened by events resulting from climate change such as severe, lengthy droughts, floods, loss of vegetation and other resources that previously used to be abundant in their environment?
- How can you help people in the community (individually or in groups) develop skills in and use of their pADLs to advocate for themselves so that they can access resources needed to adapt to the adverse consequences of climate change?

For occupational therapy educators:

- What competencies do your students need in order to work effectively with people in the community to help them adapt to the negative consequences of climate change?
- What curriculum revisions can you make to ensure that the students are equipped with these competencies?

For occupational therapy scholars:

- Think of research questions that can guide your scholarship geared towards contributing to a body of knowledge about the role of occupational therapy in helping people individually and in groups adapt to the negative consequences of climate change.
- Discuss how you would operationalize a research agenda step by step to answer those questions.

For the WFOT and national associations:

- What steps do you need to take to ensure that content that will equip students with skills to work with people individually and in small groups in the community to help them adapt to adverse effects of climate change is included in the occupational therapy curricula?
- What strategies can you use to help occupational therapy practitioners expand their scope of practice to include working with individuals and groups in the community who need to adapt to the adverse effects of climate change?
- How can you promote research to help develop an evidence-based knowledge base that can be used to develop occupation-based models of practice for use by occupational therapy practitioners who work with people individually and in groups to facilitate adaptation to the adverse effects of climate change?

3.4 Principle 4: Community sustainability in the face of environmental catastrophes

Occupational therapy practitioners shall be encouraged to develop competences for empowering communities to find ways of facilitating meaningful occupations in a sustainable manner among

community members, taking into account the need to maintain equitability and occupational justice. The relationship between social dimensions and ecological environmental factors as they relate to sustainability involves consideration of equity, awareness of sustainability, participation, and social cohesion (Murphy, 2012). Social sustainability is also related to the concept of occupational justice, which includes the ethical, moral and political issues of justice that are related to human occupation. Consideration of the notion of occupational justice denotes empowering people to pursue meaningful occupations in a sustainable manner and such empowerment is only possible through person-centred interventions (Nilsson & Townsend, 2010). Contemporary frameworks of occupational justice (Stadnyk, Townsend, & Wilcock, 2011) explain how structural factors underlying occupation such as the economy, policy, cultural values, and social support systems interact with contextual factors, such as individual, group, or community characteristics to shape the outcomes of occupational performance so that justice or injustice is experienced. We argue that occupational justice is the outcome of social sustainability, which could be regarded as a continuous interface between structural and contextual factors.

Equitable access to meaningful occupations intra- and intergenerationally is based on the acknowledgment that groups are disproportionately affected by climate change and that current consumption and production patterns have an influence on the accessibility of such occupations by future generations. Raising the general public's and occupational therapists' awareness of the need to enhance sustainability by reducing consumption is a key aspect of promoting social sustainability. If groups are aware of environmental and social sustainability, they may be willing to modify their decisions so that their occupational participation impacts the ecological environment more positively. Such decision making and participation would promote social cohesion, promoting harmony in the way that resources are utilised, and promoting peaceful relationships among groups of people. This means that:

Occupational therapy practitioners:

- Develop programs for working with small groups in the community in order to facilitate awareness of the need for a unified occupation-based action towards sustainability
- Implement occupation-based programs in such a way as to empower communities to develop cohesion and to advocate for themselves in order to ensure sustainability

Occupational therapy educators help students develop skills necessary to:

- Educate communities about issues of sustainability
- Implement culturally sensitive strategies to encourage cohesion and goal directed occupational behaviour to enhance sustainability

Occupational therapy scholars:

- Conduct research to investigate the best models for improving community awareness of sustainability and its relationship to daily occupational performance
- Develop and test models that can be used to guide interventions designed to increase cohesion and empowerment so that communities can initiate action to facilitate sustainable occupational behaviour

The WFOT and national associations

- Promote practice that includes education of communities about sustainability and its relationship to occupational behaviour, facilitation of community cohesion, and empowerment of communities so that they take action and advocate for themselves to ensure increased sustainability

3.4.1 Reflective questions

For occupational therapy practitioners:

- On a scale of 1 to 10, with 1="No competence" and 10="Extremely competent", please, rate how competent you feel about your skills in facilitating community cohesion in order to promote action towards sustainability
- Explain the step by step process of developing a program that you can use for education of small groups in the community about sustainability, its relationship to daily occupational performance, and actions that people can take as a community to change occupational behaviour in order to promote improvement of health and sustainability

For occupational therapy educators:

- How could you integrate content about community education on sustainability in your occupational therapy program?
- How could you help your students to develop skills in culturally sensitive interventions to increase community cohesion and unified action to promote occupation-based sustainability initiatives?

For occupational therapy scholars:

- How could you integrate community education about sustainability, and unified community action to improve sustainable occupational behaviour into your scholarly agenda? Please, be specific about the steps that you would take.

For the WFOT and national associations:

- What could be your role in promoting community education about sustainability and unified action towards promoting occupation-based community initiatives to improve sustainability?

3.5 Principle 5: Developing professional competence for administering occupation-based interventions to address sustainability issues

Occupational therapy practitioners shall be encouraged to develop and maintain competence in administering occupation-based interventions to help interested service users and communities address ecosystem sustainability issues. It is required that all occupational therapy practitioners practice competently in their professional work. Competent practitioners maintain their knowledge, skills, and performance through life-long learning. This process includes maintaining and developing competencies that are needed in the context and settings in which occupational therapy services are provided. A continually changing society will change the context and settings in which occupational therapy is provided. The current responsibility of health care professionals to help society meet its aspirations for sustainable development is one example of such a change in context. This change requires new knowledge, skills and attitudes in order for occupational therapy practitioners to be able to practice competently. This means that:

Occupational therapy practitioners:

Consistent with the principles of life-long learning:

- Expand their theoretical frameworks to include new knowledge about the interrelationships among health, human occupation, global climate change, and sustainability
- develop evaluation and intervention tools addressing issues pertaining to sustainability of participation in various types of occupations given their impact on the ecosystems

Occupational therapy educators:

- include the topic of sustainability in occupational therapy curricula
- develop learning outcomes related to the interrelationships among health, human occupation, global climate change and sustainability
- develop learning outcomes related to occupational therapy evaluation and intervention addressing sustainability of participation in occupations given their impact on the ecosystems

Occupational therapy scholars:

- include the interrelationships among health, human occupation, global climate change, and sustainable participation in occupations in their research agendas
- conduct scholarship of practice including development of evaluation and intervention tools for use in facilitating sustainable occupational lifestyles

The WFOT and national associations lead in the development of:

- standards for education of occupational therapists in sustainable occupational participation
- a professional code of ethics incorporating facilitation of sustainable occupational participation among its principles of ethics
- standards of practice for facilitation of sustainable participation in occupations

3.5.1 Reflective questions

The following questions are designed to help the users of this document reflect on how they can contribute to the development of occupational therapy competence in sustainable practice.

For occupational therapy practitioners:

- What kind of knowledge and skills do you need in order to be competent in contributing to sustainability in your practice?
- What kind of educational support do you need in order to become competent in contributing to sustainability in your practice and how should this support be provided?
- What kind of practical support (for example assessment tools) do you need in order to be become competent in facilitating sustainability in your practice and how should this support be made available to you?

For occupational therapy educators:

- How could a discussion of the interrelationships among sustainable participation in meaningful occupations, health, global climate change, and sustainable development be integrated into your occupational therapy educational program?
- How could learning outcomes emphasising the interrelationships among sustainable participation in meaningful occupations, health, global climate change, and sustainable development be formulated?
- What kind of learning activities and evaluation instruments could be used to assess these outcome variables?

For occupational therapy scholars:

- How could investigation of interrelationships among health, participation in meaningful occupations, global climate change, and sustainable development be integrated in your research agenda?

For the WFOT and national associations:

- How could you facilitate competent practice that meets current responsibility of

occupational therapy practitioners to help society meet its aspirations for sustainable development?

What strategies and resources would you need for this task?

4. BACKGROUND TO THE GUIDING PRINCIPLES

In this section, each guiding principle is discussed in more depth. Further information can be found in the sources listed in the references.

4.1 Principle 1: Understanding sustainability - An occupational therapy perspective

In this section, we discuss specific facts about sustainability and why occupational therapy practitioners need to be concerned about this topic. Biological organisms depend on resources in the environment for their survival. Sustainability refers to the ability of an organism to use such resources to meet its needs without jeopardizing the ability of its progeny to meet its own needs in the future (Bidabad & Mastorakis, 2014). In terms of occupational therapy, we can think of sustainability as the ability of individuals to pursue chosen meaningful occupations without jeopardizing the need for other people now and in the future to pursue their own chosen meaningful occupations. According to the theory of resilience (Holling, 2001; Pisano, 2012), humanity survives in a complex, dynamic, adaptive socio-ecological system, in which human agents and the biophysical context are intimately interrelated and inter-dependent. In this complex interrelationship, humanity's ability to survive (what resilience theorists refer to as "persistence") is dependent on the human ability to initiate physiological, behavioural, and ecological, along with possible genetic changes in the long term, that make possible successful response to unpredictable environmental changes. Since humanity is dependent on the resources available in the ecosystem for survival (including survival of the ability to pursue healthy, meaningful occupations), sustainability can be understood as a method of ensuring human survival by creating not only social and economic, but also ecological prosperity. Thus, resilience is in essence an endeavour to create this kind of prosperity and therefore to enhance the human socio-ecological system's "ability…to absorb disturbances and still retain its basic function and structure" (Walker & Salt, 2006, p. 1).

In order to create resilience as defined above, it is important to understand that the climate change that we are experiencing is a result of a combination of factors that threaten the human socio-ecological system by creating rapid and far-reaching disturbances that the system is not equipped to absorb. The reason for these perturbations that are overwhelming the system's resilience is that according to the World Wildlife Fund (2012), the human population is currently using the equivalent of 1.5 planet earths (in resources) to sustain itself (including sustaining occupational lifestyles), a rate that is clearly not sustainable. This unsustainable use of the earth's resources and destruction of the earth's ecosystem is a result of both rapid human population growth and human activities (occupations) to sustain a lifestyle of overconsumption (Aoyama, Hudson, & Hoover, 2012; Dennis, Dorsey, & Gitlow, 2015; Hocking & Kroksmark, 2013; Ikiugu, 2008; Ikiugu & McCollister, 2011; Wagman, 2014; Whittaker, 2012). Of course we need to bear in mind that the 1.5 planet earths that humanity uses is only an average. In some parts of the world, people consume many more resources than that. According to the WWF (2012), Sweden for example would need 3.7 earths for the Swedish to sustain their current lifestyles. This means that citizens in western countries really need to adapt their occupations. So, the challenge for us will be to explore how people can live an equally meaningful occupational life with less environmental impact. That is why a case can be made for occupational therapy to lead the charge in mitigating the problem of climate change while at the same time helping people who are adversely affected by the problem and those in poorer parts of the world adapt to their circumstances using occupation-based interventions.

4.2 Principle 2: The role of occupational therapy in Contributing to mitigation of environmental damage due to unsustainable lifestyles

As discussed in section 4.1, one way of addressing the problem of unsustainability is by mitigating the severity of climate change so that its negative effects on the ability of the human species to survive on earth in the long term are modulated. Mitigation can be understood to include: 1) reducing consumption so as to conserve the resources to ensure that the planet can support more people; and 2) engaging in activities (occupations) that facilitate restoration of the earth's ecosystem so as to enhance its ability to support humanity. However, mitigation is also based on understanding that sustainability is multi-layered and occupational therapy practitioners need to understand this multi-layered nature of the issue in order to plan effective interventions to modulate the problems associated with unsustainability.

4.2.1 The Multi-Layered Components of Environmental Sustainability

The kind of society that we develop depends on the resources available to us and the climate and topography of the place in which we live and therefore exists in a multi-layered context. In small scale societies with little to no infrastructure, the range of resources can be limited to what is available in a particular locale, whether a valley or grazing land that supports nomadic life, while in modern states with more complex economies, there is inter-connection to the rest of the world through trade and goods supply routes.

Over time, as trade has developed, global interconnections and industry have resulted in complex relationships among production, consumption of goods, and the environment (McAusland, 2008). One of the sustainability problems with this trend is that globalization has shifted production of goods using environmentally dirty practices to countries with low regulation of pollution. Import of goods that have been produced using such polluting processes back to countries with higher pollution restrictions leads to high net unsustainable pollution through consumption of such goods. On the other hand, some of the processes that have been thought to be protective of the environment, such as consuming locally produced goods, could actually be more damaging. For example, it has been found that importing agricultural goods into the United Kingdom from New Zealand may be less environmentally damaging than consuming locally produced goods even after factoring in the effect of transportation of such goods. Therefore, it is not clear what the right course of action might be except that consumption with awareness is the only approach that has a reasonable chance of leading to a minimal carbon footprint. In the end, the impact of each corporation's production and goods transportation practices on the environment must be evaluated individually to determine if the corporation is making reasonable efforts to exert minimum pressure on the environment and resources.

Another example of this complexity is the effect of modern information technology on the environment (Vickery, 2012). Use of information technology can lead to increased efficiency so that the input per unit product is reduced, leading to less impact of goods production on the environment. On the other hand, the relatively short life of technological devices such as computers and lack of component serviceability means that occupations dependent on computerised hardware (such as documentation during therapy, electronic communication during work and for leisure, etc.) are contributing to widespread dumping of equipment as waste. It is often more expensive and complex to repair than to replace such equipment. In addition, a modern social culture of consumerism that is promoted by the current economic actors does not provide incentives for repairing equipment rather than throwing them away. Sometimes, we even throw away devices (such as mobile phones) when they are perfectly operational so as to acquire the latest models as advertisements encourage us to do. These electronic gadgets are made of components that can be recycled but are dangerous to handle and too hazardous for landfills. This toxic junk is transported across the world in bulk to the less developed countries in

the world such as Africa and Asia where labour to handle the waste is cheaper and safety standards and environmental regulation are less stringent. In those parts of the world, recycling is carried out by subsistence level workers without industrial protection. The workers use techniques such as burning off plastic in open fires in order to extract usable raw materials, which contributes to accumulation of impurities in the atmosphere. In other words, occupations related to consumption in one part of the world (e.g. phone and computer use in the West) affects not only the planetary environment but also the health of people in another part of the world far away, which once again has ethical implications.

Another layer of unsustainability consists of the continued reliance on fossil fuels. As the accessible reserves of these fuels become scarce, their extraction moves to more inaccessible and pristine areas of the planet, or else more environmentally destructive methods such as strip mining are used to extract them. In addition to the global warming effects of burning fossil fuels, these extraction methods add direct, irrevocable and large scale environmental damage. Of course development of alternative sources of energy would be the logical approach to mitigate this problem. However, lack of cost-effectiveness of these alternatives has been a disincentive to making this shift. One of the reasons for this comparative lack of cost-effectiveness is that fossil fuels are kept artificially cheap because the environmental cost (so-called externalities in business) is not factored into the prize. Furthermore, fossil-fuel industries have deliberately undermined any attempts to develop alternative viable energy sources in order to protect their profits. The consequence is that the progress of human development is actually being retarded and ultimately threatened by fossil fuel dependency. As a consequence, present infrastructure, trade patterns, transport methods, and social organisation through every level of society are still determined by a fossil fuel legacy that is increasingly unsustainable.

While bearing all the above discussed complex layers of unsustainability in mind, there is need to be cognizant of the fact that occupational therapy practitioners are increasingly relying on technology to deliver services through modalities such as tele-health, in order to maintain their roles in a digitised information environment. The environmental impact of such methods of service delivery due to the electrical power consumption by the equipment, and the power sources (for example batteries that have to be disposed at the end of use) has to be taken into account as well. As services are moved out of large hospitals and health care centres and into the community, or are organised into larger treatment centres, there are other consequences such as the need for transportation (whether by the therapist or the service user). The structural design and location of services and delivery patterns can have considerable influence on the consumption of fossil fuels, and the wear and tear of vehicles which also have a limited life span, and have to be processed at the end of use.

While the use of hybrid or electrical vehicles may be a possible way of mitigating the damage to the environment resulting from transportation to deliver services, it is still not clear to what extent the electricity used to power such vehicles may contribute to the environmental damage. Further, the manufacturing and servicing of the vehicles and the processing of components at the end of use may incur higher environmental costs. The above analysis indicates that while examining models of practice that we can use in our mitigation efforts, we need to bear in mind that we live in a very complex, multi-layered world. The solutions to the problems of unsustainability must be similarly complex, consisting of a mixture of individual actions by citizens of the world, government policies, technological innovations, etc. However, in the end, we have to make a decision to initiate simple, well-thought-out steps in the right direction if solutions to the complex problems are ever to be found.

4.2.2 Role of occupational therapists in the mitigation of the multi-layered unsustainability

As mentioned in section 4.1, mitigation of the problem of unsustainability and climate change can be achieved by: 1) reducing consumption so as to conserve the resources to ensure that the planet can

support more people; and 2) engaging in activities that facilitate restoration of the earth's ecosystem so as to enhance its ability to support current and future human populations. The above strategies can be actualized through occupation-based interventions. For example, occupational therapy practitioners are already exploring ways of reducing environmentally damaging overconsumption of resources through platforms such as the Occupational Therapy Sustainable Practice Network (Centre for Sustainable Healthcare, 2017a). As indicated in the literature cited in earlier sections, occupational therapy scholars are recognizing the need to reduce overconsumption and environmental degradation as human beings pursue meaningful productive, leisure, and self-care occupations.

Disposable consumerism is a key driver of global climate change (Jackson 2009). The materialism and consumerism prevalent in contemporary cultures can also impact on individual and social well-being, for example by increasing "individual alienation, social fragmentation and civic disengagement", while weakening more spiritual, moral and ethical ways of being (Carlisle et al, 2009 p. 1556). Individual well-being can also be affected by the frequent negative messages in the media. News updates focus on bad events of the day, which can generate negativity about the condition of humanity and the wider world, leading to increased stress, fear and low mood (Szabo & Hopkinson, 2007; Nellis & Savage 2012). Product advertising can decrease self-esteem and heighten social anxiety, by suggesting that people aren't 'worth it' unless they have a certain latest product. This runs counter to public health messages based on the idea that people have inherent value, that they are already 'worth it' and worth taking care of. Things that make people happy are not necessarily consumable items, but rather things that may increase individual worth more widely, such as community engagement (especially in natural environments), flow experiences and close relationships (Lieberman, 2013). It has been argued that occupational therapists can help 'reactivate' the true caring and altruistic occupational nature of people through the mindful engagement in occupations that don't rely on consumerism, and through heightened awareness of environmental impacts and living more harmoniously with the world (Whittaker and Sadlo, 2016). In other words:

> Increasing concerns for the environment (and, ultimately, physical limits to resources) have the potential to counter trends towards materialism, individualism and consumerism, and in so doing could also contribute to our health and wellbeing, as individuals and as social beings in a finite but infinitely precious world. (Carlisle et al., 2009, p. 1560)

Finally, the published literature does not indicate that occupational therapy practitioners have so far been extensively involved in facilitating participation in occupations aimed at restoring the environment, but this is one of the roles that they can explore further as a profession. For example, the question arises as to how occupational therapy practitioners can work with people as individuals and in small groups within the community to help them restore their local life-supporting ecosystems through occupations such as gardening, planting trees (re-afforestation), conserving marshlands, etc.

4.2.3 Exploration of environmentally sustainable occupational therapy services in different areas of practice

Occupational therapy practice is determined by service needs. It can be argued that these needs are person-centered, but the determination of service user needs is itself made by the employing corporation or government agency for which the occupational therapy practitioner works. The determination of need is also relative to the society in which the service is delivered. It may therefore be necessary for practitioners to visit their clients using their own cars, and the distances covered depend on the distribution and geography of the service user base. For this reason some practitioners may reasonably find that it is difficult to practice using a totally environmentally sustainable approach and at the same time earn an adequate livelihood.

However, many occupational therapy practitioners work with people in long term care and other settings in which service users need interventions to support health promotion, maintain or increase community engagement, or contribute to public health. In these settings occupational therapy practitioners contribute to sustainability because their interventions may reduce dependency on other services, reduce cost, and reduce demand for health care associated with chronic diseases that over time require complex interventions. In terms of environmental sustainability, this means that reducing demand for medical services by keeping people healthy through occupation-based interventions may minimize consumption of resources (for example by decreasing use of office supplies, need for transportation, etc.). At the same time, we need to work directly with service users who wish to live more environment-friendly lifestyles by helping them adapt their occupational behaviour patterns as necessary.

For occupational therapy practitioners to practice sustainably however, it is important that they develop methods of conducting cost-benefit analysis so that their services are valued not only in monetary but also in environmental terms. Practitioners cannot do this without input from administrators, finance departments, and accountants who can help them identify the pattern of costing their services. For example, the establishment of a low key horticultural group in the community, an activity that gives a sense of wellbeing to people with long term mental health conditions living in the community, may contribute to a reduction in: demand for the General Practitioner's time; incidences of crisis intervention; etc. At the same time, community-based interventions may increase the use of other health-care staff's time, even while likely increasing survival rates of service users over their life span. So, the cost of healthcare staff's time must be weighed against the saved general practitioner's time and the added quality life for the service user. Thus, environmentally sustainable occupational therapy means constantly evaluating these cost-benefit analyses in order to determine the effects of intervention on improving environmental sustainability.

Some of the tools that can help in the above described analysis may be the procedures outlined in Ikiugu (2008) among others. In this text, there is a detailed discussion of how every action can have an environmental impact (for example making decisions on simple actions such as whether to drive or to walk to another part of the hospital campus would mean adding or not adding to the carbon pollution). These individual initiatives are consistent with recent research in public health in which it has been demonstrated that simple strategies such as regular changes in position from sitting to standing, taking short breaks for exercise, and trying to move around throughout the day can significantly improve workers' health status (Cooley & Pedersen, 2013; Neuhaus et al. 2014). In others words, whether we are looking at health or the environment, individual actions can have a significant impact, hence, the need for individuals to claim their agency in addressing these issues through reflective action in their daily lives.

4.3 Principle 3: Helping occupational therapy service users adapt to environmental damage due to unsustainability

Ongoing mitigation efforts may slow, but cannot prevent further climate change (IPCC, 2014). Irrespective of any measures taken at this point, climate change will present a significant risk, including death, injury, ill health, and disrupted livelihoods for many people in the world (Field et al., 2014). Adaptation will be needed in order to deal with these impacts of climate change. Adaptation refers to the "process of adjustment to actual or expected climate change or its effects. In human systems adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects" (IPPCC, 2014, p. 5).

As mentioned before, the effects of climate change will be disproportionately experienced by people living in poverty. This means that those who have been the least responsible for causing the problem and therefore have benefited the least from polluting activities will bear the most risk (see our discussion of the ethical imperative of unsustainability earlier in order to place this statement in context). Anticipating and adapting to these impacts requires action at multiple levels, from the local to the international, within both public and private spheres (Burton, Diringer, & Smith, 2006).

Occupational therapy practitioners can collaborate with civil society organisations and local communities to initiate policy measures and strategies for helping individuals adapt to the negative consequences of climate change. These measures can occur for example by collaborating with organizations with whom occupational therapy practitioners already have strong relationships, such as Disabled People's Organisations. This collaboration would ensure that policies and strategies developed by such organizations reflect the needs of stakeholders and individuals that are vulnerable to the problems arising from climate change.

While developing measures for adapting to the adverse effects of unsustainability, it is important to bear in mind that although climate change is an environmental problem, it has implications for all spheres of life. Adaptive measures have to be taken while considering human occupation in relation to personal (individual), local (community) and global (planetary) contexts (Persson & Erlandsson, 2014). Following is a brief examination of these measures:

Practical action at individual and social level

At the individual level, people can learn how to change their occupational choices and behaviours in order to continue participating in meaningful occupations and remaining healthy in the context of the changing climate. For instance, individuals whose livelihood depends on agriculture may opt to learn new skills (such as working in the service industry) as a way of adapting to inability to survive on subsistent farming due to changes in climate. Alternatively, they may opt to learn new farming methods such as hydroponics or aeroponics so that they are able to continue participating in productive agricultural occupations which are highly meaningful to them without the need for allot of rain or large amounts of water. Such methods of farming would also reduce the need to cultivate new land which would be a mitigating factor because the land would have a chance to heal and rejuvenate, thus increasing the human carrying capacity.

At the social level, occupational therapy practitioners and scientists can use their expertise to guide society towards developing policies that encourage ways of life that are consistent with what Orr (2009) called the "Climate Culture Change". Such change would mean development of a culture characterized by fair distribution of wealth and a focus on true human needs rather than consumerism for the sake of it. The above discussed approaches require humanity to think carefully about the kind of culture that constitutes "a good life" and develop a new metric of measuring progress in terms of well-being rather than blind production of objects, some of which are harmful to human health and well-being (Max-Neef, 2010).

4.4 Principle 4: Community sustainability in the face of environmental catastrophes

The interaction between the economy and people's lifestyles (commonly referred to as social matters) are the main causes of environmental concerns (Littig & Grießler, 2005). What people do, how they live, and the consumption and production patterns over time affect environmental sustainability. As consumers, people drive the market forces that shape what products are manufactured and consumed. For example, the use of disposable rather than re-usable products in everyday life makes a difference in terms of the sustainability of resource use and environmental degradation, and this affects the ability of other people, particularly the disadvantaged, to pursue meaningful occupations

and live a good quality of life. The United Nations Environmental Program [UNEP] (2015) proposes the following key principles for sustainable consumption and production:

a. Improving the quality of life without increasing environmental degradation and without compromising the resource needs of future generations [this relates to occupational justice by aiming at improving "quality of life", which necessarily means making it possible for all people, current and to be born, to pursue meaningful occupations].
b. Decoupling economic growth from environmental degradation by:
    - Reducing material/energy intensity of current economic activities and reducing emissions and waste from extraction, production, consumption, and disposal of products.
    - Promoting a shift of consumption patterns towards groups of goods and services requiring lower energy consumption and material use without compromising quality of life.
c. Applying life-cycle thinking which requires consideration of the impacts of all life-cycle stages of the production and consumption process on the ecosystems.
d. Guarding against the re-bound effect, where efficiency gains are cancelled out by resulting increase in consumption. (p.10)

Occupational Therapy practitioners can facilitate reflection on how these principles are applied to daily occupational performance and patterns of human occupation. For example, people could choose to perform occupations in such a way as to reduce carbon emissions. One could use public transportation or carpooling for mobility, choose local rather than imported products, etc. (Hocking& Kroksmark, 2013). This reflective living can influence patterns of consumption and production in positive ways so that a good quality of life is advanced in a manner that also ensures that environmental resources are available and equitably distributed for use by current and future generations. In addressing occupational performance issues with individuals and communities, occupational Therapy practitioners can promote deliberate exploration of how the daily choices that individuals and communities make encourage use of resources in an environmentally ethical manner. This may involve consideration of changing lifestyles among other factors.

Changing lifestyles by shifting to use of cleaner and more sustainable energy sources and conservation of resources can reduce the health risks and the emissions associated with climate change. Thus occupational therapy practitioners may also work with the general population to promote more sustainable occupational lifestyles. Examples of models for working with the general population include the *Green Lifestyle Redesign* (Dieterle, 2009), which involved developing a course in which university students and Faculty members explored the interaction between lifestyles and sustainability. Systemic community participation and social cohesion for mutual benefit is required for social sustainability. Promoting such participation as part of rehabilitation and health promotion would lead to building of healthier communities and lives, improving peoples' resilience in preparation for forthcoming changes.

Agyeman and Evans (2004) argued that the rights of future generations to access environmental resources requires that intergenerational equity be considered in today's policy-making decisions. Since humans reproduce patterns of human occupation, the patterns that are reproduced should promote reduction of greenhouse gas emissions, management of waste, and sustainable consumption and production. This management of occupational patterns would ensure that resources are available to support ongoing participation in meaningful occupations. Occupational therapy practitioners work with people with diverse lifestyles and should recognise that everyone has a role to play in promoting social sustainability. This includes sustainable design concepts for communities so that accessibility to occupations and resources is improved for all people. Also, it is important to consider that

degrading environmental conditions may contribute to social disharmony and thus pose a risk to health. By promoting inter and intra-generational social sustainability, occupational therapy practitioners can play an active role in preventing social disharmony and risk to health.

4.5 Principle 5: Developing professional competence for administering occupation-based interventions to address sustainability issues

In this section, we will clarify what we mean by competence in sustainable practice. For further reading we recommend the document, *Entry-level competencies for occupational therapists* (WFOT, 2008), and *WFOT Minimum standards for the education of occupational therapists* (WFOT, 2017b).

4.5.1 The ongoing effort to become competent in dealing with sustainability in occupational therapy practice.

Competencies in occupational therapy can be described as constituting a combination of knowledge and understanding, interpersonal and practical skills, and ethical values and responsibilities. In addition to generic competencies shared with other professional disciplines, occupational therapy practitioners need specific competencies such as being able to assess and strengthen the person-occupation- environment interaction for the purpose of promoting health, enhancing therapeutic and professional relationships, managing the occupational therapy process, professional reasoning, and the context of professional practice.

In order to become competent in promoting health and sustainability, occupational therapy practitioners need to adapt their knowledge, skills and attitudes to this context. However, this adaptation should be done in view of the specific competencies that reflect the value for competent occupational therapy practice in general. This means that occupational therapy practitioners must rely on client-centeredness to promote health and well-being through occupations with the primary goal of enabling people to participate in meaningful and culturally relevant occupations while taking into account the environment and ecosystems that make such participation possible.

Attitudes, knowledge, and skills are layers of competence that form the basic repertoire of skills that occupational therapy practitioners need in order to be able to perform tasks and duties in a competent way. Becoming competent to deal with sustainability in occupational therapy should be an ongoing journey that involves all these layers. Relevant or high level knowledge and skills are important, but in order to make change, these skills need to be complemented with the appropriate attitudes.

Attitudes are views and values forming the basis and direction for professional practice. In order to be competent to deal with sustainability in practice, we suggest that occupational therapy be based on the basic belief that;

- human driven global climate change (the extreme effect of unsustainability) is a significant challenge to human health in our times
- human occupation and health are related to environmental, social, and economic sustainability, and ultimately, to climate change

Knowledge refers to the theoretical and/or practical understanding needed to practice occupational therapy. In order to be competent in addressing sustainability issues in practice, in this document we suggest that occupational therapy practitioners be knowledgeable about the interrelationships among health, meaningful participation in occupations, global climate change, and sustainable development. Skills refer to the professional use of methods, reasoning, procedures, and tools as necessary in the practice of occupational therapy. In regard to sustainability, this would mean skills in use of methods, reasoning, procedures, and tools necessary to plan and administer occupation-based interventions to help interested service users and communities tailor their participation in meaningful occupations to environmental and ecosystem sustainability needs.

5. DEVELOPING AND INCORPORATING SUSTAINABILITY IN OCCUPTATIONAL THERAPY – CASE EXAMPLES

The discussion so far indicates that a body of knowledge about sustainability and its connection to occupational performance is incrementally developing within the occupational therapy literature. In this section we will provide concrete examples of how issues related to sustainability are already being integrated into occupational therapy education, practice, and research. The first example is based on an assignment given to students in a bachelor's degree program at Linköping University in Sweden. This example demonstrates how knowledge about sustainability can be integrated in occupational therapy education. The second example comes from an occupational therapist working at a National Health Services project in Ninewells Hospital in Dundee, Scotland. The third example demonstrates the type of scholarship and research that can be conducted to provide evidence about the effectiveness of occupation-based interventions in helping service users change occupational behavior in order to contribute to mitigation of the consequences of climate change and environmental damage. The fourth example illustrates how empowerment of service users in Argentina helped them change their occupational behavior so that they contributed to sustainability.

5.1 Example 1: Sustainability in occupational therapy education –A Swedish example

This example illustrates how guiding principle #s 1, "understanding sustainability-an occupational therapy perspective"; 2, "the role of occupational therapy in contributing towards mitigation of environmental damage due to unsustainability"; and 5, "developing professional competence for administering occupation-based interventions to address sustainability issues" may be operationalized. According to the Swedish Higher Education Act, higher education institutions should, in the course of their operations, promote sustainable development to ensure that present and future generations have a sound and healthy environment, economic and social welfare, and justice. Like other higher education institutions in Sweden, Linköping University has a responsibility to contribute to the development of a better environment and a society which is sustainable in the long-term. One of the sustainability goals at Linköping University is for each student, within his/her respective education programme, to acquire basic knowledge and understanding of how the environmental dimension of sustainable development is relevant to the student's future profession.

Sustainability issues have been part of the Occupational Therapy programme at Linköping University since 2008. The following is an example of how competencies related to sustainability can be incorporated in occupational therapy education. It is part of a course for second year Bachelor of Science degree students. The title of the course is Occupational therapy towards participation and accessibility. The learning outcome was that upon completion of the course, the student would be able to explain how sustainable development affects human health at an individual and group level. The learning activities included: a student-centred two hour lecture on sustainable development in an occupational therapy context; an observation assignment where two to three students worked together to observe an occupation that was being performed within a particular environmental context; answering reflective questions related to their observations; and participating in a closing seminar. The observation of occupational performance was guided by two questions; 1) how does the observed environment and occupational performance affect sustainable development? and 2) how can the environment and occupation be adapted in order to better facilitate sustainable development? The students were asked to summarise their observations and, based on relevant references, reflect on how occupational therapy practice could promote sustainable development. Progress towards the learning outcome was examined in the closing seminar where the student groups presented their summarised observations and reflections. The following two cases are examples of occupational therapy students' summaries and reflections during the closing seminars.

Case 1

Students in group 1 observed a community based institutional living setting for older adults that was run by the municipality. The observations were made during mealtime. The students observed that there was a lot of food that was thrown away each day at this institution (contributing to food resource unsustainability). The reason for this waste of food was that the residents did not like the food and also that the portions were too big. For reasons of efficiency, the food was cooked in a central kitchen providing meals for several institutional living facilities in the municipality. Additionally, the food was not always culturally familiar to the residents, meaning that residents were often served with meals with flavors to which they were not familiar. On the whole, the residents had no influence or control over what was served or even the size of the portions since the food was served on pre-made plates.

In their reflections the students related this observation to the constructs of environmental, economic, and social sustainability. They observed that it would be more **economically and ecologically sustainable** for the municipality if the food was cooked, prepared, and individually served at the residential facility. The students also related their observations to **social sustainability**. They noted that cooking in the residential facility would increase residents' choice, occupational participation and health. The home-like food flavors would increase the residents' appetite, and involving the residents in planning and preparing the meals would give them increased opportunity to control what they ate, how the food was presented during service, and the preferred portion size for each individual. The students argued that in order to involve the residents in this activity, there would be a need for occupational therapy competence in adapting the cooking environment to fit the physical and cognitive abilities of the residents. Examples of suggested modifications included adapting the kitchen sink for accessibility by wheelchair users, and writing recipes in such a way that individuals with cognitive challenges could use them. They also suggested that occupational therapists could be involved directly or indirectly in educating direct care staff on how to increase residents' participation in this activity.

Case 2

Students in group 2 observed the occupation of community mobility. They borrowed wheelchairs from the clinical lab at the university and tried to board the communal bus and the tram. They found out that these transportation systems were not accessible for people in wheelchairs without assistance. For example the staircase on the bus entrance was too high for wheelchair users, and there was limited space for maneuvering the wheelchair once inside the bus. The ticketing system was not accessible for people with physical and cognitive disabilities.

In their reflections, the students noted that the public transportation system excluded people with disabilities and thereby presented a barrier to the aspiration for sustainable development. They saw these barriers as constituting an example of occupational injustice. Persons with disabilities should be able to use public transportation systems independently. They argued that inaccessible public transportation leads to more special and individually adapted solutions resulting in **increased use of fossil fuels and thus it was ecologically unsustainable**, resulted in higher transportation costs for both the individuals and society (**economically unsustainable**), and led to social exclusion of people with disabilities, negatively impacting their participation and health (**socially unsustainable**). The students recommended that occupational therapists use their competence to make recommendations for the trams and buses to be made more accessible to wheelchair users. They argued that

occupational therapists should take part in contributing to the development of accessible transportation systems that promote ecologically, economically, and socially sustainable public transportation systems for all citizens.

5.2 Example 2: Sustainability in occupational therapy practice

This example illustrates operationalization of guiding principle #s 2 (see explanation of principle # 2 above) and 3, "helping occupational therapy service users adapt to the consequences of environmental damage". Rob, who was an electrician by profession, had suffered a devastating stroke which left him with communication problems and severe right hemiplegia. After treatment in the acute stroke unit, he was transferred to a specialist rehab unit and then discharged to home. Unfortunately, the home was not conducive to his safety and he was re-admitted to a psychiatric unit due to concerns about his mental health and wellbeing. He was admitted to the Ninewells hospital due to renal failure which was treated in the acute ward. Around this time, his behaviour deteriorated. He became aggressive and inappropriate, smearing feces among other negative behaviours. He became disruptive and threatened other patients and staff. He was described as having no rehab potential at that time.

At this point, I was asked to intervene and along with my Technical Iinstructor[2], I assessed Rob. During the initial interview, Rob was unkempt and seemed distressed. We immediately had him transferred to a side room where we helped him begin participating in a personal ADL routine in order to help him structure his day.

At that time, Dundee City Council had just completed laying down footpaths throughout the city. We began a routine of taking Rob on walks along the path through the woodland. His mood immediately improved. He became less agitated and more relaxed, and his communication skills improved. This was the first time he had been outdoors for two years. We continued to spend time with him in the woodlands in South Ninewells as his behaviour in the ward and with his family improved. With the structure and access to greenspace, use of our workshop area, and use of humour, Rob's condition improved remarkably culminating in him eventually being able to attend his daughter's wedding. Rob then moved on to another specialist unit to build on his success and complete his rehabilitation.

In the above example, the human built structures degraded the natural environment by making access to greenspaces difficult. This degradation of the environment had a health consequence for individuals like Rob. By creating a footpath, Rob was able to adapt to the change in the environment (with the help of the therapist) and access the greenspace using the path. Rob was the first person to access the greenspace with the help of the occupational therapist in Ninewells and the success we had with him clearly demonstrated the huge benefits of conserving greenspaces and making them accessible for the sake of human health and well-being. Greenspaces are also beneficial to the ecosystem because they produce oxygen and they are carbon sinks, which helps absorb carbon dioxide (a greenhouse gas) from the atmosphere. Thus, by creating a greenspace, the occupational therapy practitioners contributed to better health for their service users while contributing to mitigation of environmental damage due to climate change. This project was part of the NHS Forest (2015) and other examples of occupational therapy involvement can be found at their website: www.nhsforest.org

[2] "Technical instructors work with occupational therapists to produce and fit a wide range of devices to aid patients' treatment. These can include; levers on taps for people with arthritis or extending chair legs for people with mobility problems. Technical instructors would usually have a background in a trade subject, such as carpentry and would usually hold a relevant qualification, such as a City & Guilds in a practical skill" http://www.nhscareers.nhs.uk/explore-by-career/wider-healthcare-team/careers-in-the-wider-healthcare-team/clinical-support-staff/occupational-therapy-support-worker/

5.3 Example 3: Addressing sustainability in occupational therapy research

This example illustrates operationalization of guiding principle #s 1 and 2. Ikiugu (2008) proposed a model for occupation-based understanding of global warming and climate change. In the model (Modified Instrumentalism in Occupational Therapy [MIOT]), he proposed that the human being is an agent at the center of the complex process of climate change. Through participation in occupations, humans affected not only the earth's climate but also human health, poverty, material inequalities, population growth, diseases, and governance. He suggested that climate change could only be successfully mitigated if all these issues were addressed contemporaneously, and the issues could be addressed effectively by educating individuals so that they made responsible, informed occupational performance choices.

To test the above stated hypothesis, Ikiugu et al. (2015) conducted a research study to investigate the extent to which an occupation-based intervention (based on MIOT guidelines) was effective in increasing awareness of the relationships among occupational performance, climate change, and related issues among study participants, and their willingness to change occupational behavior to ameliorate the issues. Fourteen students and faculty members at a University in Mid-West USA participated in the study. Intervention consisted of 5 one-hour weekly group sessions in which participants discussed occupational behavior, climate change, and related issues based on assigned chapters from Ikiugu's (2008) book and other resources.

The findings indicated that as a result of the intervention, the occupational behavior of half of the study participants significantly changed so that they participated more in occupations that were consistent with a positive effect on the environment such as recycling, walking or riding a bike instead of driving, being more conscious of the carbon footprint of their goods consumption habits, etc. In addition, study participants felt more empowered not only to make changes in their own occupational lifestyles but also in their ability to educate others about the need to make similar changes. In other words, the effects of the study had the potential to be amplified through study participants' interactions with other people in the community.

5.4 Example 4: Sustainability in occupational therapy Practice - An Argentine example

This example illustrates operationalization of principle # 2 in general occupational therapy practice. In an Argentine Foundation that offered workshops and day center activities for youth and adults with intellectual disabilities, service users began to make art with recyclable objects such as empty coffee cans. Other therapeutic activities in these groups included making musical instruments out of everyday objects that are commonly thrown away, such as soda bottle tops, tin cans, yogurt containers, and tomato cans, among other items.

Through the above described activities, service users became increasingly aware about the importance of taking care of the world's ecosystems. To build on this increasing awareness, one workshop with service users focused on recyclable items that service users could identify in their houses and what they could do to recycle them. This approach was geared towards helping each person become an agent of ecological preservation beginning with management of resources at home. However, services users wanted to go even further. They proposed a project initiative called "recycling and donating toys". In this project, every year, service users identified toys in their homes that were no longer being used and brought them to the day center. They also invited members of the community to contribute to the effort. Service users fixed toys that were donated and needed repairs and donated them personally to children in need twice per year: July and December. Service users experienced great satisfaction from finding a way of giving back to their community, which changed their perception of themselves as recipients of services to supporters of others in need.

The above is an example of an occupation-based intervention (involving repair of toys and making musical instruments from household recyclable objects) and empowerment of service users to participate in sustainability efforts. Awareness of the link between occupations and eco-sustainability was increased among service users, who were adults with intellectual disabilities. As a result, they became empowered to participate in occupations that were consistent with a positive impact on the environment and eco-system. This outcome was consistent with findings by Ikiugu et al. (2015) that helping service users understand the link between their occupational behaviors and the environment may empower them to make occupational behavior changes for a positive impact on the environment (see example # 3 above).

6. RECOMMENDATIONS

This document is meant to guide occupational therapy practitioners in modifying professional practice so as to promote sustainability while enhancing service user health through facilitation of judicious occupational choices and performance in society. This is essential because the effects of unsustainability such as climate change that currently threaten human survival are demonstrably a result of human occupational behaviour as people individually and collectively pursue productive, leisure, and self-care endeavours. In order to guide practice in this direction, it is recommended that the WFOT encourage occupational therapy practitioners, educators, scholars, and national organizations to explore possibilities of:

- Widening their scope of practice to incorporate sustainability in activity analysis and consider the health co-benefits of a low carbon lifestyle, and to include interventions that promote health while contributing towards sustainability among their clients
- Aligning their work with the United Nations Sustainable Development Goals.
- Working with service users individually and in groups in the community to help them adapt to the adverse effects of climate change (an outcome of unsustainability) using occupation-based interventions
- Including content in curricula to help occupational therapy students acquire knowledge and develop competence in working with individuals and communities to help interested service users adopt sustainable occupational lifestyles and adapt to the adverse consequences of climate change
- Conducting research to clarify the relationships among meaningful occupational performance, sustainability, health, and well-being
- Conducting research to inform development of evidence-based and occupation-based models to guide occupational therapy interventions for interested service users and groups to help them develop sustainable occupational lifestyles and adapt to the negative consequences of climate change
- Including competence in promoting sustainability and helping people adapt to the adverse consequences of climate change in occupational therapy educational standards
- Including sustainability within national associations' ethical principles
- Encouraging occupational therapy practitioners to widen their scope of practice to include a 'well' population to promote sustainable occupational lifestyles and adaptation to the adverse effects of climate change

7. EPILOGUE

Occupational therapy practitioners have always realized the significance of the environmental context for human occupational performance and good health. During the pre-paradigm period of the profession (the moral treatment movement) spearheaded by William Tuke and Phillipe Pinel in Europe, practitioners paid much attention to the environment in which a client participated in exercises, physical activities, and recreation as an alternative to restraint as a therapeutic method

(Foley, 2005; Ikiugu, 2007; Kielhofner, 2009). Application of the moral treatment movement ideas in the US included environmental modification to reduce stress that hindered healing for clients with mental health issues (van Atta, Roby, & Roby, 1988; Bradford, 1975; Foley, 2000; Ikiugu, 2007; Sutherland, 1993). This recognition of the environment as a significant source of healing continued with the formal founding of occupational therapy in the early 20th century, and all through the profession's history as indicated by the emphasis on the holistic view of the Person, Environment, and Occupation unity in the current professional paradigm (Canadian Association of Occupational Therapy, 2007; Canadian Association of Occupational Therapy & Department of National Health and Welfare, 1983; Polatajko, Townsend, & Craik, 2007).

However, up to this point in the profession's history, the environment has been mostly seen as a context within which human occupational performance occurs, and as a source of supports or barriers to occupational performance. It is only recently that occupational therapy practitioners and scientists have started examining the effect of human occupation on the environment and the eco-system in general and how that effect in turn affects occupational performance and human health (Dickie, 2013; Hocking & Kroksmark, 2013; Wagman, 2014; Hudson & Aoyama, 2008; Ikiugu, 2008; Ikiugu et al., 2015; Whittaker, 2012; Wilcock, 2006;). This recent scholarship calls for re-examination of the environment within which occupational performance takes place from a perspective of inter-dependence, where the environment supports occupational performance, adaptation, and health, and occupational performance is in turn either a constructive or destructive force that builds and enhances, or degrades this environmental context. This re-examination of the person-environment interaction through occupational performance indicates a need for rethinking of the role of occupational therapy.

In this reconceptualization of the profession's role, occupational therapy practitioners are seen as experts who can facilitate occupational performance that results in: 1) reconstruction of the environment and the ecosystems on which all life depends for survival (sustainable occupational performance); and 2) human adaptation to the socio-ecological shifts resulting from environmentally destructive human occupational performance. It is hoped that the five guiding principles presented in this document will not only facilitate this re-thinking of the role of occupational therapy in society but also in action that supports meaningful, sustainable, health-enhancing occupational performance that ensures continued survival of life on earth and access to meaningful and health enhancing occupations for future generations.

In presenting these guiding principles, it is acknowledged that occupational performance is not only adaptive but also symbolic. It is an expression of the very consciousness of individual and community identity for human beings (Kielhofner, 2009; 2008). Therefore, there are deep-rooted cultural values, beliefs, and traditions that dictate how people engage in occupations (Ikiugu, 2008; Ikiugu & Pollard, 2015). These symbolic aspects of occupation make change in occupational performance complicated and time-consuming, since it has to begin with development of individual awareness about what an occupation in which one participates really symbolizes. Only after such awareness is developed can individuals truly change occupational routines that constitute their identity and life trajectory. Therefore, occupational therapy practitioners have to be patient, persistent, and hopeful as they embark on their role in helping society engage in more sustainable occupations. Much scholarship is needed to inform this reconceptualised occupational therapy practice. The principles presented here constitute only the very beginning of this process.

8. AUTHORS' REFLECTIONS

As these principles were developed, the authors were aware that most of the team members represented the developed Western world. Even though an attempt was made to recruit members of the team from the developing (low income) countries, most of them ended up being from England. There was only one team member from Africa, two from Japan, one from Sweden, and one from the

US. The team member from the US was born and grew up in East Africa and therefore brought into the process perspectives from both East Africa and North America to the best of his ability. It is therefore acknowledged that the worldview represented in these principles is only partial at best, and there is a need to recruit more team members from the low-income parts of the world in future revisions of the document.

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Appendixes

Appendix A: Authors

Following is the list of authors and their brief biographies:

Samantha Shann, Dip COT, PGCert, MSc:

Samantha is the WFOT Executive liaison to the Sustainability in Occupational Therapy Practice Project. She is the WFOT Vice President Finance and was the person responsible for putting the Sustainability Master Project onto the WFOT agenda. Samantha is based in the UK and runs a private occupational therapy practice. Through her WFOT role she is involved in the development of occupational therapy, both new occupational therapy associations and occupational therapy education programmes worldwide.

Moses N. Ikiugu, PhD, OTR/L:

Dr Ikiugu is Professor and Director of Research at the University of South Dakota, Occupational Therapy Department. He was the project leader during the development of this document. He has been an occupational therapy educator and researcher for 16 years. Much of his scholarship since 2008 has focused on the interphase between occupational performance and sustainability. He was originally born and grew up in Kenya, East Africa, and migrated to the United States of America 23 years ago. He has served in the American Occupational Therapy Association (AOTA) Representative Assembly for 6 years and is the current AOTA delegate to the WFOT.

Ben Whittaker:

Mr Whittaker is Occupational Therapy Programme Lead at the Centre for Sustainable Healthcare in Oxford, where he co-ordinates the Occupational Therapy Sustainable Practice Network. He was the team leader during the development of the WFOT position statement on environmental sustainability, and for the initial stages of this guiding principles document. Mr Whittaker was one of the authors of the COT briefing paper on sustainable development. He is a Senior Occupational Therapist at Bluebell House Recovery Support Centre, a specialist service for people with personality disorder and complex needs in Sussex Partnership NHS Trust, UK.

Nick Pollard, PhD:

Dr Pollard is a Senior Lecturer in occupational therapy in the Department of Occupational Therapy and Vocational Rehabilitation, Faculty of health and Wellbeing, Sheffield Hallam University.

Ida Kåhlin, PhD:

Dr Kahlin is a senior lecturer in Occupational Therapy at Linkoping University and President of the Swedish Association of Occupational Therapists. As a member of the Board of the Swedish Association of Occupational Therapists, Dr Kahlin was one of the authors of the position statement "*Occupational therapy and sustainable development*" that was adopted by the General Meeting of the Swedish association in November 2010. The Swedish association then became the first Occupational Therapy association in the world to have such a statement. Prior to the WFOT council meeting in Taiwan in 2012, this statement was translated into English and a leaflet was distributed to all WFOT delegates attending this meeting. In 2013 she was one of the leaders of a workshop on occupational therapy and sustainable development at the national occupational therapy conference in Stockholm and results from this workshop were presented at the 2014 WFOT conference in Yokohama, Japan. The aspiration to include sustainability issues in occupational therapy education and practice is an ongoing work within the Swedish association. One recent important step is as been to add a requirement for occupational therapists in Sweden to have competencies in sustainability. Since 2010

Dr Kahlin has been lecturing on this subject in the bachelor's degree programme in occupational therapy at Linkoping University.

Mark Hudson, PhD:

Dr Hudson is Professor of Anthropology in the Department of Occupational Therapy and Director of the Research Institute for Sustainable Environments and Cultures at Nishikyushu University (the University of West Kyushu) in Japan. He is a member of the editorial board of the *Journal of Occupational Science*. Apart from occupational science, his research interests include resilience and sustainability, hunter-gatherer archaeology, the historical ecology of Alpine societies, and the history of violence. His 1999 book, *Ruins of Identity: Ethnogenesis in the Japanese Islands* won the John Whitney Hall prize of the Association for Asian Studies. He recently co-edited the book, *Beyond Ainu Studies: Changing Academic and Public Perspectives* (Hawaii University Press, 2012) and is a co-editor for Volume 1 of the forthcoming book, *Cambridge World History of Violence*.

Roshan Galvaan, PhD:

Dr Galvaan is an Associate Professor in occupational therapy at the University of Cape Town (UCT) Department of Health and Rehabilitation Sciences, Division of Occupational Therapy. In her research, she explores occupational choice as a fundamental construct of occupational justice, showing how identity, power and agency are negotiated through occupational choices within oppressive structures. Her work addresses the issue of how everyday occupational engagement and choices occur, with particular focus on exclusion, injustice and equity.

Sonia Roschnik, DipCOT:

Sonia Roschnik is Head of Unit and International Lead at the Sustainable Development Unit (SDU) for the NHS, Public Health and Social Care system in England where she has worked since 2008. The unit has developed plans for a system wide approach which include a Carbon Reduction Strategy (2009), Route Map to Sustainable Health (2010) and a Sustainable Development Strategy (2014) in close partnership and regular consultation with other parties across England. Ms. Roschnik graduated as an Occupational Therapist in Oxford and worked as a clinician in Scotland, Switzerland, New Zealand and the Solomon Islands. She was Deputy Director of Operations at Cambridge University Hospitals Foundation Trust for 4 years after managing a major new building development and leading on emergency planning. She has worked as an advisor to the WHO and UNDP supporting the development of guidance for greening health care systems, sustainable processes and climate change adaptation plans, and is a Faculty Member at the SDU/Cambridge Institute for Sustainability Leadership where she teaches a "Global Course on Leadership and Sustainable Health". For 10 months in 2014, Ms. Roschnik was Director of the Humanitarian Centre in addition to her SDU role.

Mami Aoyama, PhD:

Dr Aoyama was Professor and Associate Dean in the Department of Occupational Therapy, Nishikyushu University, Japan. In 2015, she was a visiting researcher at the Department of Occupational Therapy, Faculty of Health Sciences, University of Ljubljana, Slovenia. She is now the Representative of the Board of Directors of the "I Am" P & W Research Institute. Through her research on the Minamata disease incident in Japan, she learned that nature and the social environment are closely connected to people's health, livelihoods and happiness.

Appendix B
Readers

Petra Wagman, PhD:

Dr Wagman is senior lecturer in Occupational therapy and program director at Jonkoping University, School of Health and Welfare, Sweden. Her main interest concerns the relationship between what people do, think about what they do, and how they feel (i.e. the relationship between occupation and health) and ranges from the individual's health to the global consequences of people's occupational pattern. In 2014 Dr Wagman published the article, *How to contribute occupationally to ecological sustainability: A literature review* In the *Scandinavian Journal of Occupational Therapy.* In 2014, she published another article, *The model of human occupation´s usefulness in relation to sustainable develop* in the *British Journal of Occupational Therapy*.

Elizabeth Townsend, PhD:

Dr Townsend is Professor Emerita, Dalhousie University, Nova Scotia and Adjunct Professor in the Faculty of Education University of Prince Edward Island. She is known internationally for institutional ethnography research on client-centered practice, enablement, and occupational justice.