United Nations | Department of Economic and Social Affairs

Expert Group Meeting
Families and Climate Change
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Summary Report

Introduction

The experts acknowledged that climate change is one of the most pressing issues of our time, profoundly impacting families around the globe. Families are at the forefront of experiencing the impacts of climate change, from extreme weather events to food and water scarcity, negative health impacts, and economic instability. At the same time, there is a growing recognition of the potential of families to play a pivotal role in climate action. By adopting sustainable lifestyles and practices, families can significantly contribute to reducing environmental footprints and enhancing climate resilience. The integration of Indigenous knowledge and sustainable family farming practices also offers valuable insights for promoting biodiversity, climate justice, and resilience. Emphasizing the importance of supporting family farms and recognizing their role in global agriculture and food security is then necessary and vital.

As the global population reached eight billion in November 2022, significant demographic trends, including decreasing mortality rates, increased life expectancy, and declining fertility rates, present both challenges and opportunities for sustainable development. These demographic shifts highlight the critical need for sustainable practices and responsible resource management.

The relationship between climate change and demographic trends extends to issues such as migration and urbanization. Climate-induced migration and displacement disrupt livelihoods and exacerbate social and economic challenges, underscoring the need for comprehensive disaster risk reduction and sustainable urban planning. In terms of technological advancements, renewable energy, smart grids, and carbon capture are critical in mitigating climate impacts and promoting sustainability. Families can leverage these technologies to adopt sustainable practices at the household level, further contributing to climate action.

Understanding the multifaceted impacts of climate change on families and recognizing their potential as agents of change is essential. By fostering sustainable practices within families and communities, promoting inclusive policies, and integrating family-oriented approaches into environmentally friendly strategies, we can address the challenges of climate change more effectively. This holistic approach is crucial for ensuring a sustainable future for all, where families are empowered to act as stewards of the environment and advocates for a sustainable world.

Climate Change and Demographic Trends

With the global population reaching 8 billion in November 2022, two major underlying demographic trends exist: an increase in life expectancy at birth, and a global decline in fertility rates. Global population projections are estimating that Sub Saharan Africa is the only region in the world that will continue population growth trajectory until 2050. While other regions such as Central and Southern Asia, Northern Africa and Western Asia, and Latin America and the Caribbean will experience some growth as well, it will not be as pronounced. Regions like Oceania, East and Southeast Asia, Europe and Northern America, have already plateaued and are beginning to decline.

Some argue that continued population growth will have impacts on environmental sustainability. For instance, proponents of Thomas Malthus' theory

argue that as population grows more rapidly than food supply, this will impact the ability for agricultural regions to support the growth. This theory is supported by evidence of current and projected global numbers of food insecure and chronically malnourished people suggesting that the population can no longer be supported by current food supply.

Some observe that wars and conflicts in some parts of the world stemming from food related instability and violence can be linked to competition over natural resources emerging as a result of population growth. Moreover, climate change also impacts the availability of water affecting two-thirds of the global population. However, critics of the Malthusian theory argue that while the global population has risen dramatically since the 1800s, standards of living have also improved and famines have been less severe and easier to manage. Neither did Malthus anticipate the widespread technological advancements allowing cultivation of new land, irrigation systems, pesticides and fertilizers, and innovations in farming techniques; all of which have increased crop yield and variety. While there are arguments to be made for and against his theory, the consensus is about the importance of sustainable development and responsible resource management to address the potential challenges of population growth. This consensus has given rise to the perspective that the problem is bigger and more complex than just population growth alone. There are a variety of factors within each population such as, distribution, composition, and consumption patterns. Population distribution is the pattern of settlement and dispersal of a population within an area. It impacts environmental sustainability by adding pressure to local environments, this is especially true in developing countries where livelihoods are heavily dependent on natural resources. This will impact migration patterns and urbanization.

Experts agreed that unsustainable patterns of consumption and production are main barriers to environmental sustainability. In developing countries, despite rapid population growth they have had the slowest increase in carbon emissions. Consequently, population growth should not be looked at as a main factor in emissions, rather we should be looking at other contributing factors. Developed countries emit more than 80 per cent of the world's carbon emissions, while

containing under half of the world's population while the poorest countries emit less than 1 per cent of the emissions.

Importantly, by developing and increasing the coverage of family-oriented social protection mechanisms, we can ensure food security in the regions of the world that are vulnerable to the effects of climate change. Doing this will also contribute to achieving of SDG 1 (no poverty) and SDG 2 (zero hunger). Moreover, a family system approach to address the needs and circumstances of migrants in concentrated areas, such as urban environments, as well as environmental migrants can contribute to the achievement of targets under SDG 1 & 2. This approach will also help to meet the goals of SDG 3 (good health and well-being), SDG 6 (clean water and sanitation), and SDG 11 (sustainable cities and communities).

In order to address the climate crisis effectively, we need an inclusive, intergenerational approach, allowing us to meet the needs of current and future families. Families must have the support to be effective actors and advocates in the climate crisis. By developing and effectively implementing policies, standards, and incentives, families can adopt more sustainable consumption patterns at the household level, (SDG 7 - affordable and clean energy, and SDG 12 - responsible consumption and production).

Some experts noted that climate change is now playing a significant role in family formation due to the impact of climate anxiety on youth. Specifically, the various impacts of climate change such as air pollution, forest fires, temperature increases, extreme weather events, droughts, and rising sea levels, are now having effects on the physical, mental, and community health globally. It is important to consider why climate change is affecting mental health and fertility to understand what the planet will look like for future generations. These climate hazards have direct effects such as witnessing extreme weather events, and awareness of climate change and its impacts. The indirect effects are worsened health outcomes, increased hospital visits, rise in violence, loss of livelihoods, and disruption to mental health services. The mental health outcomes because of these direct and

indirect effects have been anxiety, depression, helplessness, post-traumatic stress disorder (PTSD), suicidal behavior, and substance abuse. This is leading to a decreased desire of youth to start a family and have children. Addressing declining birth rates requires a nuanced understanding of several factors, including eco-anxiety and shifts toward individualism.

Considering the impact of population growth on climate change, the current ecological footprint of humans is too high and unsustainable. This footprint can be understood as the product of the population size, the way of life, and use of resources per person. Some climate change activists argue that the fall of birth rate will help fight climate change and reduce the impact on the planet. According to data, 25 per cent of the total increase in emissions is due to growth of emissions per capita, while 75 per cent of the increase is due to population growth. However, the Global South demonstrates an increase in population but with a lower footprint per capita; the opposite is true in the Global North. Climate security measures must be decisive especially in terms of emissions reduction. Fossil fuels are used for power, transportation, and industries contribute largely to global increases in emissions and climate change. Innovation in technology has allowed for the emergence of renewable energy, such as solar, wind, and geothermal, that are at the forefront of climate protection efforts and there has been a significant increase in their use as of 2022. However, this transition to renewable energy has not been rapid enough as discussed in the COP28. In terms of agriculture, there should be a focus on cultivating more vegetables and less focus and demand on meat and milk as they are main contributors to climate change.

The role of youth

Societal change often occurs from one generation to the next, and rarely, if ever occurs within a generation. As youth accounts for 16 per cent of the global population, youth-led movements have become a driving force in advocating for a low-carbon and climate resilient future, resulting in making climate change central in global policy discussions and bringing about tangible changes at the grassroots level.

Youth are seen as having an incredible impact on the climate change movement and their action has led to the acceleration of climate protection. The younger generation has demonstrated climate anxiety and dissatisfaction in their governments' responses to climate change. Thus, we need youth involvement in climate protection through voting for environmentally friendly candidates at elections, technological innovations and engineering, facilitating a transition to a climate-friendly economy, and promoting sustainable lifestyles to the older generations. Youth and their families are often the place where climate security discourse occurs, marking the importance of intergenerational learning.

Families today must think more long term as lifespans are higher than ever with babies born in 2025 having a high chance of living for a century. Families are incredibly important in shaping climate change engagement, and it is crucial to acknowledge and include all family members as climate actors. Some experts acknowledged that the anti-natalist discourse can pose a challenge for countries with low fertility and can result in norms and pressures against families with children. In some countries of Europe, and East Asia where fertility rates are below replacement rate, long term consequences relating to the economy, social security system, and national budget have been emerging. For example, 58 per cent of the Italian population are older than 50, while 32 per cent younger than 40.Government policies and efforts need to ensure that men and women have adequate access to education and family planning services to make informed decisions about starting or expanding their families. The anti-natalist discourses, especially in countries with below-replacement rate fertility are counterproductive. Instead, families must be empowered and considered a fundamental actor for climate resiliency and protection policies.

Challenges ahead

Families, particularly those affected by poverty, face significant challenges in

implementing necessary behavioral changes due to limited resources, income contraction and the growing costs of adaptation which add financial burdens. It is often noted that these factors may potentially exacerbate existing inequalities. The concept of a "just transition" ensures that no one is left behind in the move towards sustainability. As emphasized by experts, families are foundational to fostering sustainability. Policies aimed at ecological investments and financial incentives are crucial for supporting those adversely affected by the green transition. Families play a pivotal role in shaping attitudes and behaviors, acting as conduits for intergenerational knowledge transfer and promoting a sense of environmental responsibility and community engagement. Furthermore, families are deeply passionate about environmental protection because of the future of their children. Children and youth inspire their parents to adopt values aligned with sustainability goals. Supporting young people through education and training is essential in preparing them for future leadership roles. Encouraging youth to channel their creativity and entrepreneurial spirit toward sustainable solutions is vital. Families can be seen as 'prosumers'—not only consuming and producing energy but also contributing to social and cultural wealth.

Governments and policymakers should involve youth and families, along with their organizations, as key agents in shaping a sustainable future. By embracing the dual role of families as both consumers and producers, we can foster a more sustainable and inclusive society. Families, especially those in vulnerable situations, should receive targeted support, , to mitigate the financial challenges posed by climate change. Governments can also help support families is by expanding tax incentives for green technologies, products, and services to promote their adoption and sustainable consumption. Finally, advocating for policies that enhance product longevity and sustainability, such as the “right to repair,” will be crucial to achieve a sustainable future. There must be comprehensive engagement and support for families in the Governments’ climate initiatives. By fostering a culture of sustainability within the family unit, Governments can drive significant progress toward ambitious climate goals.

Climate Change Perspectives

Indigenous perspective

The importance of Indigenous farming practices as part of sustainable farming was emphasized and a case study of Ollin Farms presented . Not only do Indigenous farming practices can offset climate change, but they can inform regenerative and sustainable farming efforts for families to act as stewards of the land. Furthermore, youth of color and their families can play an important role in achieving climate justice.

As has been well acknowledged, the Indigenous farming practices have fostered and maintained intergenerational relationships for centuries as ecosystem management and climate health techniques have been passed on through generations. This knowledge has become the foundation of modern regenerative sustainable farming techniques because of its adaptivity in different conditions, shaping landscape, natural environments, biodiversity, and agriculture.

The six core principles of regenerative agriculture include understanding the context of farm operation, minimizing soil disturbance while maximizing crop diversity, keeping the soil covered, maintaining the living roots year-round, and finally integrating livestock. What's more, integrating biophysical, socio-economic, and non-material (spiritual, cultural values and beliefs, etc.) elements into our farming practices is critical for truly regenerative farming. Practices such as rotational grazing allows plants and animals to have a truly symbiotic relationship results in sequestering carbon and growing topsoil.

Indigenous farming practices have also been successful in fortifying the community and strengthening the relationship with nature. By supporting and creating community and youth programs, the intergenerational care and

environmentally friendly practices and values for the planet and natural resources can be fostered.

To achieve sustainable future, it is recommended that Government agencies identify local regenerative family farms and Indigenous communities focused on ecosystem health to actively engage with them in the policy drafting process. This will ensure that subsidies, insurance policies, grants, etc., are supporting and incorporating regenerative local food production systems. Governments should also engage and educate families in local communities so that they can be active participants in ecological land management. For example, local farms can become partners in engaging the public by hosting families for educational opportunities. Local, regional, and national discussions should include youth and families of color as they play an important role as climate advocates. Additionally, maintaining and increasing biodiversity should be prioritized as a key way to foster climate resilience in agricultural communities.

Relational perspective: family stability and climate change

An expert offered a perspective on the intricate relationship between family stability and environmental sustainability necessitates a comprehensive and multidisciplinary policy approach. By acknowledging the profound influence of social factors on resource consumption, policymakers can develop holistic and sustainable solutions that integrate social and environmental considerations.

Research drawing from human ecology principles highlights that environmental conditions significantly impact human behavior and marital relationships. For instance, lower-quality neighborhoods with economic disadvantages are linked to lower marital quality, increased spousal violence, and higher levels of marital conflict. In contrast, rural settings with stronger social support structures and a slower lifestyle tend to enhance family cohesion and stability. Food choices and their geographical availability also play a crucial role in marital satisfaction. Food insecurity can negatively impact mental health and well-being, leading to increased marital conflict. Conversely, access to fresh, nutritious

foods, such as omega-3 rich fish and fresh vegetables, can enhance mood and reduce anxiety, contributing to better marital relations.

The stability of families, in turn, contributes to environmental sustainability with studies indicating that married couples living together consume fewer resources compared to divorced couples living separately. The environmental cost of divorce is significant, as it leads to the formation of more households with higher resource consumption per person. For example, divorced households in the United States use substantially more electricity and water compared to married households. Further, the demographic shift towards smaller households, driven by higher divorce rates, contributes to increased energy consumption and carbon emissions. Larger, stable families can achieve economies of scale in resource use, potentially leading to lower environmental footprints. This interdependency between family stability and environmental sustainability underscores the need for policies that strengthen family units.

To address these challenges, new policies should be considered to develop and implement family support programs. Initiatives that promote healthy communication, conflict resolution, and relationship management within families, can reduce divorce rates and enhance family stability, thereby contributing to environmental sustainability. We must address social determinants of family stability, policies targeting issues such as poverty, unemployment, and access to affordable housing which then are likely to create a supportive environment for families, and potentially reduce divorce rates. Family stability considerations should be integrated into environmental policy to mitigate any potential impacts, for example, by promoting affordable and sustainable housing options that cater to family needs. Finally, investments in further research to continue the exploration of the relationship between family stability and environmental sustainability across diverse contexts is necessary to inform effective policy development. Adopting a multidisciplinary approach that incorporates social and environmental policy interventions is also likely to create a sustainable future where family stability and environmental sustainability work hand in hand.

Intergenerational perspectives

Families and circular economy: the intergenerational responsibility

The concept of integrating families into the circular economy framework encompasses several elements that promote sustainable living and environmental responsibility. The framework is grounded in principles such as reuse, recycling, donation, community building, self-production, regenerative farming, and awareness and education. Each of these principles has been illustrated through real-life stories from families across Europe, showcasing how they adopt and integrate these practices into their daily lives. Families play a crucial role in promoting the circular economy through practices like reuse and sharing. Within and between families, the reuse of items, especially children's clothing, helps in reducing waste and promoting sustainability. Recycling is another key element where some families contribute by creating products from leftover fabric and selling them online, thus reducing waste and encouraging recycling. Regenerative farming is also demonstrated by some families f who run an organic farm within city boundaries. Their holistic approach to farming serves as both a livelihood and an educational tool for their children, emphasizing the importance of sustainable practices. Community building is demonstrated through initiatives like the 'Time Bank,' which helps families in Italy build networks and support systems based on mutual aid rather than monetary transactions. This fosters strong community ties and sustainable relationships.

The Hungarian Large Families Association (NOE) representative emphasized the importance the association attaches to preserving food and reducing waste through community-shared resources and technology. This not only helps in food conservation but also strengthens community bonds. Awareness and education are pivotal in fostering a sustainable mindset. Families are encouraged to recognize the importance of sustainable resource use to ensure a fair and good quality of life for all. The overarching message is that the family unit is not the problem but the solution to environmental sustainability. By recognizing, supporting, valuing, and enhancing the role of families in the circular economy, policymakers can leverage the potential of family units to drive significant environmental change. Integrating

family stability and environmental sustainability through circular economy practices can create a more sustainable future. These practices not only reduce environmental impact but also foster strong community relationships and instill sustainable values in future generations.

Climate Change, Migration, and Urbanization

Climate change is projected to significantly impact human habitation, with temperature increases over the next fifty years exceeding those of the past six millennia. Most of the global population currently resides in regions with mean annual temperatures between 11-15°C and 20-25°C. However, as temperatures rise, one-third of the global population will endure extreme heat currently confined to the Sahara, affecting regions such as Sub-Saharan Africa, Central and South America, India, Southeast Asia, the Arabian Peninsula, and Australia. This climatic shift will impact health, food security, and water access, emphasizing the urgent need for adaptive strategies.

Climate change induces new categories of environmental migrants, encompassing a spectrum of movement from preemptive relocation to forced displacement. Projections estimate that environmental migrants could reach over 200 million by 2050, with the Institute for Economics & Peace (IEP) anticipating up to 1.2 billion displaced individuals due to environmental disasters. The majority of those affected will reside in low-income and small island nations. For instance, it is projected that by 2050, rising sea levels may submerge 17 per cent of Bangladesh, displacing 20 million people.

Environmental migration is complex, involving both sudden onset disasters and gradual environmental changes. While most migrants move internally within their countries, international migration raises concerns about border security and the safety of environmental migrants. It is important to keep in mind that although migration serves as an adaptive mechanism to environmental degradation and food insecurity, it is fraught with vulnerabilities, particularly for those unable to pre-plan their migration. A significant but often overlooked aspect of climate

migration is its impact on families. Migration decisions often involve only some family members, typically heads of households or able-bodied young adults, to reduce the food burden on the family through remittances sent home. Extreme weather events may force entire families to relocate, exacerbating their vulnerabilities. Transnational families face restrictive migration policies that hinder family reunification, transforming family relationships and straining emotional ties.

Migration contributes to rapid urbanization, with displaced individuals predominantly settling in urban slums or marginal areas, where they face social exclusion and lack access to economic and political life. As of 2020, 763 million individuals migrated internally, and 281 million lived outside their native countries. Urbanization exacerbates housing shortages, with over 1.1 billion urban residents living in slum-like conditions, lacking affordable housing and basic infrastructure. Substandard housing impacts health, particularly for children, the older persons , and individuals with disabilities, leading to respiratory and neurological disorders, developmental delays, and increased domestic violence.

Sustainable urbanization requires integrating green spaces into city planning, as demonstrated by cities like Curitiba, Brazil, and Singapore. These cities have incorporated parks and green spaces, enhancing residents' quality of life and promoting environmental sustainability.

Policy recommendations emphasize the need for disaggregated data to inform climate action and migration policies. Creating new visa options for environmental refugees, investing in irrigation infrastructure, early warning systems, and social security programs are crucial as well. Gender-specific programs, safe shelters for women and girls, training and skill-building for migrants are vital for ensuring safety and improving livelihoods. Urban planning must prioritize mixed-income housing, reliable transportation, pedestrian-friendly streetscapes, and green spaces to support diverse urban populations and promote sustainable development. A holistic approach that recognizes the agency and capabilities of migrant families and integrates family stability into environmental policies can significantly reduce the risks posed by environmental degradation and enhance

resilience. This systemic perspective is essential for building responsive programmes and policies that support families and foster sustainable urbanization.

Cities act as a connectivity between the vitality of people, their way of life and how they have developed over a course of social movements. The mobility of people and their daily lives are overlapped with the mobility of products, trade, economy, and a way of life. In order to build more resilient cities, we must look at the basic principles of sustainability within cities that have lasted centuries; analyzing how they adapted and developed their landscapes, way of life, family patterns, and managed their daily lives.

The emergence of technology over the past 20 to 30 years, has had a huge transformative effect on how we live our life today and how we communicate, for example virtually, something that did not really exist 30 years ago. Furthermore, our way of life is being monitored by many devices, and clouds, etc., effectively expanding our networks. We are living in cities , with two levels of engagement, a physical and visual world that we can see and engage, e.g., walking around the city, as well as a virtual connectivity through the cloud, which connects every movement and data. Virtual systems are connecting infrastructure, knowledge, and systems of operations. Sustainable cities cannot operate without understanding the role of this technology in shaping our everyday life and homes are a vital element to which so many systems and infrastructures must relate to both positive and negative consequences

There are two types of modalities for sustainable cities design. One of the models is how we are trying to develop our own understanding of what sustainable city design is, and how we center the family and connectivity to the locality at the heart of it. To design new communities and cities that are sustainable, there must be a shift away from the metropolis centered approach and closer look at the role of the communities. For communities to be viable, they have to look at the wellbeing and the future of children as key criteria for design. We need to redesign spaces and connectivity between homes to enable engagement with nature by creating walkable and bikeable neighborhoods, while reducing the amount of

environmental toxins by creating more green spaces. It is also important to consider meaningful work opportunities and affordable homes. The interactivity between the economy of the home and the centrality of the family or community activities, is linked to how cities can be sustainable and to provide a future wellbeing for the children.

The second modality isa so called twenty-minute neighborhood, this is an approach that started in Paris, Melbourne and Portland. This concept is now being adopted and developed as a kind of adaptation approach in the United Kingdom for a self-sufficient locality centered around a twenty-minute neighborhood or fifteen minutes city. These are just key drivers to help to transform our current dense cities into more sustainably developed cities. This is based on the concept that local governments cannot effectively manage a whole metropolis, but that management would be more efficient if divided into smaller self-sufficient neighborhoods. The design of these neighborhoods can be managed to provide the sufficient urban and garden spaces, infrastructure like schools, local markets and shops all within 20 minutes of walking distance. This would empower communities during emergencies and natural disasters, and help to self-manage and self-adapt. This has been developed to promote a practical approach towards a family centric design. Active design is a solution to develop our current urban landscape around key priorities for an active living environment. Design principles should focus on walkability and cyclability, including wheelchair accessibility around urban spaces, and green areas should be prioritized in urban planning as well. Additionally, design principles will have a reduced focus on public transport beyond the neighborhood, and very minimal priority for vehicles. Benefits include providing health and wellbeing spaces, social engagement at the local level, providing inter-community engagement, and intergenerational inclusion.

Sustainable urbanization: Case study of Venice

History teaches us that climate change must be governed and we must change our lifestyles and our model of work organization. Family and school are

both essential starting points to create a strong awareness and share the goal of guaranteeing the best living conditions for all.

A case study of Venice was presented to illustrate the necessity of constant adaptation to climate change. The establishment of Venice necessitated by social unrest was challenged by the lack of fresh water. The problem was solved by building large underground rain sequestration systems where water was filtered. The Republic of Venice managed to efficiently provide water, but also maintain the balance of the lagoon by diverting rivers, systematically cleaning canals, building the protective dams for the islands and preventing the silting up of the lagoon. Venice and its lagoon hold extraordinary environmental value as a testimony to the ability of human beings to face climate change by governing it. A resilient city is an urban system that doesn't merely adjust to climate change, rather it modifies itself by building new social, economic and environmental responses that allow urban areas to withstand long term environmental stresses. Today, a sustainable city is also a resilient city, a city that rejects the logic of profit at all cost functions within a circular economy, not the linear economy of aggressive capitalism.

Some best practices coming from the Veneto Region to address the problem of climate change include securing the territory and its inhabitants from the hydrogeological risk. The sea level in Venice has risen by about 32 centimeters since the end of the 19th century, with a projected rise in the total water level between 20 and 40 centimeters by 2050, and up to 80 centimeters in the next century. To protect the city from the rising sea levels, the MOSE (experimental electromechanical model) system of 78 independent mobile dams was created. to protect against the high water; in the last two years there has been no high water in the dam. To understand the magnitude of the risk, we have to consider that flood day in central Veneto in October 2010, affected over 10,000 families with the damages exceeding 1 billion euros. To deal with the floods, Venice has implemented a planned investment of around 600 million euros coupled with the completed construction of 13 elimination basins with another 10 being constructed. It is important to note that Venice has been able to invest in the

protection of its city and citizens, without raising taxes and further burdening the population.

Venice has also implemented a new format of social housing where you can find migrants, older persons, and young couples and houses are sold according to the needs of the family for example., Furthermore, to promote and support cyclable cities, a cycle path plan was launched in the Veneto region consisting of almost 2500 kilometers of bicycle-only paths connecting the region.

Migrant families with children with disabilities are a growing group that face double vulnerability. They lack support networks, often with severe social, economic or housing issues. To support these families, Italian language courses have been created specifically for mothers with children with disabilities, as well as artistic workshops involving music and art and theater therapy, with linguistic cultural mediators present. With these programs they have been able to overcome what seemed like insurmountable barriers. Mothers are beginning to feel less isolated and have found an important space to share not just information, but also the sense of shame and loneliness surrounding their children's disabilities.

Climate Change and New Technologies

The interconnections between climate change, family dynamics, and technological advancements are crucial in addressing the global climate crisis. Climate change affects various aspects of human life, particularly for families in regions experiencing significant temperature increases. These changes impact health, subsistence, food security, and water access, necessitating collaborative and technological efforts to mitigate adverse effects. Technology, broadly defined as the application of scientific knowledge to practical human aims, plays a vital role in climate solutions. This includes energy efficiencies, carbon capture and storage, and improving societal conditions. The United Nations Framework Convention on Climate Change (UNFCCC) highlights technology’s role through entities such as the

Technology Executive Committee (TEC) and the Climate Technology Centre and Network (CTCN), emphasizing the importance of technological innovation in climate action.

Direct impacts of technology on families include green infrastructure, utilizing sustainable materials and energy-efficient designs in construction, such as passive design strategies and Building Information Modeling (BIM), which enhances health benefits, particularly respiratory health. Technologies like thermal pumps, telehealth delivery, and AI for early warning systems for climate-sensitive diseases ensure sustainable and accessible healthcare, especially in remote areas.

Countries like Iceland and Japan have advanced legislation to maintain progress in renewable energy, highlighting the social value of alternative energy sources. Carbon capture technologies allow for trapping emissions from industrial plants to prevent atmospheric pollution, contributing to environmental sustainability. Sustainable land management techniques to control degradation and enhance productivity are essential for sustainable development. Digital technologies and geographic information systems (GIS) for climate modeling and monitoring, identify vulnerable areas, aiding in climate adaptation and resilience.

Families can significantly impact climate action through technology use in home energy and transportation. The adoption of solar power and electric vehicles (EVs) has increased globally due to reduced costs, federal tax incentives, and advancements in battery technology. However, challenges such as upfront costs, access to charging stations, and awareness about EV benefits persist.

Information and Communications Technology including social media platforms like Facebook, Twitter, and Instagram, influences public opinion and climate action. While social media can facilitate information sharing, activism, and public engagement, it also disseminates misinformation, creating confusion and skepticism about the need to address climate change. Studies show that misinformation spreads rapidly through social networks, impacting public perception and delaying climate action.

Technological innovation is critical for addressing global challenges, and collaborative global solutions are essential for advancing research, development, and implementation of new strategies. This is particularly important in vulnerable countries with minimal digital infrastructure. Adequate financing for technology is necessary to drive health care advancements, promote renewable energy sources, and develop green buildings. Education plays a pivotal role in combating misinformation about climate change. It is then indispensable for public education initiatives to focus on enhancing critical thinking skills and dispelling misinformation.

Holding technology companies accountable for their role in spreading or combating misinformation is also key for building public trust and support for climate policies. As inclusion and collaboration are fundamental to effective policymaking, policies must recognize and incorporate women's contributions to technological innovation and promote collaboration with Indigenous areas and regions most affected by climate change. Family-centric policies are crucial for building resilient and sustainable communities. Integrating a family lens into climate policies and supporting diverse urban populations through mixed-income housing, reliable transportation, and green spaces can significantly enhance community resilience and sustainability. By leveraging technology and fostering collaboration, families can play a pivotal role in climate action, contributing to a more sustainable and equitable future.

As we confront climate change, pollution, deforestation, and biodiversity loss, it is clear that awareness alone is insufficient. We require united global action and collaboration, embracing our responsibility to transmit environmental values across generations and foster ecological conservation. The dynamics of work and family life significantly influence ecological attitudes, and balancing both is crucial for human well-being. The introduction of remote work has transformed behavior and ecological impacts, driving innovation in creating sustainable, family-friendly spaces.

Human ecology and technological advances

The concept of human ecology underscores the evolving landscape of environmental concerns and our responsibility in the climate crisis. Integrating these considerations within familial and professional contexts is important to promote sustainable practices and individual well-being throughout the lifespan. Today, companies are adopting adaptable office designs to support remote and hybrid work, featuring collaborative zones, quiet areas, and amenities that enhance employee well-being. This approach fosters agility, innovation, and an inclusive organizational culture, resulting in increased job satisfaction, productivity, and reduced burn-out rates. By integrating new work methods with family-friendly policies and equal access to benefits, organizations can drive meaningful cultural change and support work-life balance. Data shows that 55 per cent of employees prefer to work remotely at least three days a week. While 85 per cent of workers now expect hybrid working and 77per cent of employees say a place to work closer to home is a must-have. Half of the workforce would quit their job if forced back to a traditional office structure. In order to meet these demands and needs, 43per cent of organizations plan to accelerate investment in flexible spaces in the next three years. While remote and hybrid work not only are the preferred structure, it also significantly reduces environmental footprints.

Flexible working arrangements have transformed family dynamics, enabling parents to manage responsibilities more equitably and spend more time with their children. Remote work eliminates commuting, providing an average of 72 minutes daily that parents can use for caregiving tasks. Seventy per cent of parents find it easier to manage family responsibilities thanks to working from home, and 53per cent of caregivers see flexible work as a significant benefit. Flexible work options enable parents, especially mothers, to maintain their work hours post-childbirth and relocate to more affordable areas, enhancing economic well-being. These arrangements reduce stress, foster stronger family bonds, and promote healthier relationships. They also break gender barriers, empowering women and minorities by creating equal access to opportunities and reducing biases.

It is advisable for organizations to prioritize inclusivity by embracing flexible work policies that accommodate diverse needs, empowering employees to thrive in a hybrid work environment. This contributes to sustainability efforts by reducing commuting emissions and office energy consumption, aligning with the goal of creating an environmentally responsible workplace. By aligning employee expectations with organizational needs, leaders can cultivate a culture that supports productivity, well-being, and collaboration, integrating work and life harmoniously. Flexible work arrangements are a transformative force, enabling parents to balance professional and caregiving duties effectively, fostering stronger family bonds, and promoting greater involvement in children's lives. Embracing these changes and integrating sustainable practices within organizational frameworks can lead to more inclusive, productive, and environmentally responsible workplaces.

Families and home: care and education for sustainability
Role of stakeholders

As the basic unit of society, family holds immense potential in shaping a sustainable future. World leaders must act urgently and put more pressure on those who contribute most to global carbon emissions. Humans have damaged the earth and treated its resources as if they are infinite, and we must return to living in respect for and in harmony with nature and the Earth which is a prerequisite for human life. Human activities have undoubtedly caused global warming mainly through greenhouse gas emissions, disproportionately affecting vulnerable communities which have contributed least to climate change. Global emissions have continued to increase due to unsustainable energy use, land use, lifestyles, consumption and production patterns. It is contradictory that humans are encouraged to work, consume, and contribute to the economy more, while also being told to reduce our consumption and downshift to make climate adaptations. The size of income is by far the most important factor in terms of consumption and climate footprints. Today, economic independence and individual achievements have become the yardsticks of freedom and success. Equality between women and

men continue to strive towards the male norm of working full time and being free from care responsibilities in the home. Unpaid care and domestic work have remained invisible, as have those performing it, who are mainly women and girls.

It takes time to live in a climate friendly way. It takes time to provide care, to cook from scratch, to care for your home and belongings. It takes time to grow your own food, and care for nature and animals in a sustainable way. It takes time to maintain a community with neighbors, family, and friends. In today's society, time is often very limited, thus, finding solutions can look like fast and processed food instead of organic treat nutritious food. According to the UN 17per cent of all the total global food production is wasted. It takes time to transfer knowledge and values between generations, as well as time to create sustainable habits and increase awareness of climate change. We must bring up children in a conscious way and start by acknowledging the existing research concerning children's needs. Children need more time with their caregivers especially during the first sensitive years of life. The attachment to the primary caregiver is crucial during brain development in the first three years when the foundations for future learning, behavior, and health are formed. This is the period of the child's life when love is needed most. To support families in this, flexible working arrangements, economic and parental support, especially for the mother as she often is the main caregiver and the child's first choice as the bond is strongest.

The individual consumer can influence emissions by becoming more aware and better informed, thus making smarter and more sustainable consumer choices. Consumers can choose sustainable transportation methods, diets, and improve energy efficiency in the home. We can recycle, reduce consumption, and use slow fashion. We also need to be role models, and inform others about our sustainable behaviors, influencing them to also change their patterns. Governments and leaders should make it easy to make environmentally friendly choices and it should be expensive to make unsustainable choices. Moreover, society needs a new narrative, we must challenge the narrative that more consumption equates to happiness.

The world's leaders must take greater responsibility and make it easier for families to adapt to climate change by providing clear information and incentives for sustainable living. The world's richest, the 1per cent own over 40 per cent of all global financial assets, and are responsible for releasing as much carbon pollution as the poorest two thirds of humanity, while at the same time, close to half of the world's population lives in poverty. The biggest driver of hunger is conflict, with 70 per cent of those affected living in areas affected by war and violence; hence climate work needs to go hand in hand with efforts to promote peace. A holistic and long-term perspective is required to stop climate change and achieve other societal goals of living longer and healthier and more fulfilling lives.

Experts acknowledged that it was essential to remember that families and homes have been foundational to human life for millennia. The home is where the first lessons of care, mutuality, and responsibility are learned and transferred to the broader care of the Earth, our common home. External agencies can learn from homes and families, rather than merely provide for them, working together to create a more sustainable future for all. The home is the bedrock of positive social and environmental behaviors and fosters attitudes and behaviors essential for addressing climate change and generating proactive solutions. That is why we must advocate for the recognition of the home as a vital space for nurturing communal and corporate responsibility.

The family is a crucial stakeholder in mitigating climate change and dealing with its impacts, and research underscores the importance of viewing the home and household as central to these efforts. Homes provide the context within which families operate, offering stability even when fragmented or displaced. It is critical for policies to understand the home as the foundation of a healthy society and recognize that the care and work within the home are core to human flourishing and well-being. A multidisciplinary approach, integrating insights from a wide range of disciplines allows for a diverse perspective leading to a comprehensive understanding of the home’s role in society. Each home is unique, yet they share common characteristics that necessitate flexible and innovative policy approaches.

The ethics of care is a pivotal concept in understanding the home's role in addressing climate change. This approach highlights the importance of respect for resources, their conservation, and just distribution, as well as the building of resilience and social cohesion. The ethics of care values interdependence and caring relationships over independence and individualism, making it a useful framework for environmental stewardship.

To create sustainable communities, public institutions and governments must prioritize homes as fundamental units in climate education and action, promoting collective rather than individual efforts. Policies should support regional and community-specific approaches, allowing homes to adapt and respond effectively to local environmental challenges. Governments should foster holistic housing policies that integrate natural and social interests, creating connected and sustainable living environments. It is also important to emphasize that strong, empowered, and resilient families are crucial for addressing global challenges. Policymakers must recognize the value of the home and integrate it into broader environmental strategies. By investing in the home as the foundation of policy, we can ensure the development of just, compassionate, and sustainable societies.

Climate initiatives

The European Union aims to become the world's first climate-neutral continent by 2050 through the Green Deal, which emphasizes competitiveness and a just transition. Key initiatives include promoting a circular economy with policies like the "right to repair" and transitioning to renewable energy sources such as wind and solar power, which constituted 22.3 per cent of the EU's electricity in 2022. These efforts have resulted in a significant shift in consumer attitudes toward sustainability, with many families adopting eco-friendly practices. The EU recognizes that family involvement is important to achieve their sustainability goals. There is robust citizen support for climate action in the EU, with a vast majority of respondents (93 per cent of EU citizens) reporting concrete actions taken to combat climate change which remains one of the top three concerns for Europeans. There is a strong backing for ambitious climate targets with 88 per cent

of EU citizens agreeing that the EU should be climate neutral by 2050. It is important to consider how gender and family status influence these attitudes and actions toward climate change.

Conclusion

With the rapid changes that we are experiencing today, we need to ensure that families are protected and empowered as agents of change and of their own destiny. It is necessary that we invest in research, and family and wellbeing indices to adapt and prepare for the constant changes occurring due to the climate crisis.

Expert meeting's discussions underscored the intricate connections between climate change, technology, demographic trends, and the pivotal role of families in promoting environmental sustainability. As the global population continues to grow and shift, the importance of sustainable development and responsible resource management becomes ever more critical. Technological advancements, inclusive policies, and family-centric approaches have a strong potential to address the multifaceted challenges posed by climate change when implemented correctly and supported by government agencies.

We need to develop and implement more effective policies focusing on the promotion of family values to counter information overload and foster trust in the future. This can be done by designing campaigns for sustainable living, fostering critical thinking and reframing of negative narratives. Furthermore, by addressing the negative psychological impacts and creating supportive environments for parents we can begin to tackle the negative mental health effects on youth. Incentives for environmentally responsible behaviour for families should be offered as well.

Families, as fundamental units of society, are uniquely positioned to influence sustainable practices and intergenerational knowledge transfer, fostering resilience and environmental stewardship. It is of utmost importance to integrate family stability into environmental policies, supporting youth engagement, and

ensuring that no one is left behind in the transition to a sustainable future. By leveraging the collective power of families, communities, and governments, we can drive meaningful progress toward achieving the Sustainable Development Goals and building a resilient, equitable, and environmentally sustainable world.