



Article

Gardening School to Support Youth Inclusion and Environmental Sustainability in Morocco

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Abstract: Youth research has, for decades, focused on examining current societal conditions and their potential shortcomings for young people in areas such as education, income, work, and gender equality. However, it has been less common to integrate planetary boundaries and so-called “overshoot” areas—such as biodiversity loss or climate change—into youth research. This paradigm shift is increasingly necessary, as six out of nine planetary boundaries have already been crossed, and the planet remains on track for approximately 2.7 degrees Celsius (°C) peak warming by 2100. In addition to planetary threats, Morocco faces social challenges, particularly high unemployment. Unemployment is highest among young people aged 15 to 24, reaching 25% over the past decade, nearly double the global youth unemployment rate. This article analyzes a case study we refer to as the “Gardening School” in Morocco, a country facing significant climate stress. It aims to (a) explore new methods for conducting more globally oriented youth research that is ethical and environmentally friendly and (b) examine the wellbeing of young people and their environment, as well as how to support and strengthen both. The findings of this article highlight the potential for youth research to develop new approaches, especially when conducted alongside young people and educational and sustainable environments. These environments enable younger generations to deepen their connection to and understanding of biodiversity, sustainability, and climate change, while learning to use natural resources in a sustainable and ethical manner. This approach ultimately aims to ensure a livable future for the coming generations and foster sustainable employment opportunities.

Keywords: youth inclusion; ecological gardening; sustainable development; climate change adaptation; global youth research; planetary youth research



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1. Introduction

The current planetary crisis—including climate change, biodiversity loss, water scarcity, and pollution—demands solutions that ensure sustainable wellbeing for all living beings, both present and future (Elo et al. 2023). North Africa and the Mediterranean region are among the areas hardest hit by ongoing climate change, warming faster than the global average (WMO 2023). Like many other parts of the world, Morocco experienced unprecedented temperatures in July 2023, surpassing 50 degrees Celsius (120 degrees Fahrenheit) for the first time. Even more extreme temperatures were recorded during summer 2024 globally, impacting numerous cities and regions across Morocco too (MAP 2024). Such heat poses severe risks to all living beings, from plants and animals to humans (Wuillez 2019).

Countries in the Global South are highly vulnerable to climate change due to warmer climates, economic structures, and limited adaptation capacities (Adare 2018). Morocco’s vulnerability stems from rising temperatures, droughts, desertification, extreme weather events, and its dependence on climate-sensitive agriculture (Van Praag et al. 2021). The

impacts of climate change vary based on social, economic, cultural, and environmental contexts, with those who are already vulnerable facing higher risks (Adapattu 2019). Vulnerability is closely tied to poverty, which increases susceptibility to exploitation and compromises overall wellbeing. The poorest populations are particularly at risk due to their dependence on favorable weather conditions. Gender inequality further exacerbates vulnerability, as it leads to higher poverty rates among young women, limiting their access to resources, power, job opportunities, and property rights (Borràs 2019).

To address the planetary crisis that threatens the future of humanity and the planet as a whole, a sustainable transformation is essential. This transformation must occur at both regional and global levels (Siirilä and Salonen 2024). Achieving this goal requires more than just technological solutions; it calls for a shift toward sustainable lifestyles, with social innovations playing a crucial role in this change (Mont et al. 2014). In this context, youth research should also contribute to finding solutions for sustainable wellbeing for all (Laine 2023). For decades, youth research has examined societal conditions and their shortcomings for young people in areas such as education, income, work, and gender equality. However, it has been less common to integrate the concept of planetary boundaries and “overshoot” areas—such as biodiversity loss or climate change—into youth research (ibid.). This paradigm shift is now necessary, as six out of nine planetary boundaries have already been crossed (Richardson et al. 2023), and current policies continue to put us on a path toward approximately 2.7 degrees Celsius (°C) peak warming by 2100 (UNEP 2023). Humanity has now brought the planet into climatic conditions never witnessed before in human history (Ripple et al. 2024).

A four-dimensional solution called “global ethics” was proposed as a response to the planetary crisis as early as the 1970s by the multidisciplinary group of scientists known as the Club of Rome (Mesarovic and Pestel [1974] 1975). This approach emphasizes the importance of learning to identify with future generations and being willing to prioritize their sustainable living conditions over personal ones. From this perspective, youth research is a key discipline engaged in listening to, collaborating with, and studying young generations. It, therefore, has a crucial role in addressing the “planetary mess” created by so-called “development”, “westernization”, or “industrialization”, which has posed a deadly threat to all living beings and the habitability of the planet for future generations (Ripple et al. 2024).

The future of the planet, including *Homo sapiens*, requires the greater involvement of young generations in adopting more sustainable ways of living, as well as their participation in discussions and decisions about their future (Laine 2023). In August 2023, the United Nations Convention on the Rights of the Child published General Comment No. 26, focusing on children’s rights and the environment, with a particular emphasis on climate change. This General Comment stresses the urgency of what states must do to safeguard children’s rights to a clean, healthy, and sustainable environment. It highlights that a clean and sustainable environment is not only a right for children in itself but is also essential for realizing a wide range of other child rights. Therefore, there is a pressing need to conduct youth research and research that focuses on young people and the sustainable use of natural resources, or young people as protectors of life (see also Laine 2023). Without providing clean water, food, air, and nature, how can children and future generations survive on this dying planet? The General Comment makes it clear that governments are accountable not only for the immediate effects of their actions but also for foreseeable future environmental threats (UN 2023). Special attention must be given to vulnerable children.

In addition to planetary threats, Morocco faces other social challenges, particularly unemployment. Between 2023 and 2024, the unemployment rate increased from 12.4% to 13.1% nationally, from 16.3% to 16.7% in urban areas and from 5.7% to 6.7% in rural areas. Unemployment is especially high among young people aged 15 to 24, reaching 36% (HCP 2024b), nearly triple the international youth unemployment rate, which stands at 13% (Statista Search Department 2024b). The risk of youth unemployment is higher among those from poor families, women, university graduates, and urban areas (Alfani et al. 2023).

Additionally, the quality of employment available to young people remains precarious, as informal work and underemployment continue to absorb a significant proportion of young workers, despite substantial governmental efforts to reduce these issues.

In this article, we explore Morocco's first gardening school, which is specifically designed to help young people in vulnerable situations become gardeners with an understanding of the ecological crisis. The gardening school aims to support both young people and Morocco's diverse natural environment by teaching sustainable ecological practices, raising awareness of the planetary crises, and contributing to sustainable transformation in Moroccan society. The school is located in an area with limited educational and employment opportunities for young people, particularly women. It was established to support NEET (not in education, employment, or training) young people in the region. However, the school has since reached a diverse group of young people. Three of the authors have visited the school, observing, interviewing, and learning about its concept.

In this case study, we examine how the school supports the inclusion of young people and the wellbeing of nature using a new planetary youth research framework (Laine 2023). This framework is structured around four dimensions, which can be summarized here as (1) youth research co-working with young people for the sustainable future; (2) postcolonial youth research and more global youth research, supporting knowledge production in the Global South; (3) multispecies studies on young people in relation to their planetary wellbeing in diverse environments; and (4) studies on new environmental ethics and the importance of embodied, collective, and creative methods in coping with, adapting to, and living with the ecological crisis (Laine 2023). Our case study, which we refer to as the "Gardening School", contributes to all four dimensions of this framework, serving as an example where different dimensions intersect. By grounding our research in this framework, we aim to support the living conditions of future generations also through our research. In this article, we will explore three questions that connect four dimensions:

1. Methodologically, what new approaches are needed to conduct more global youth research in an ethical and environmentally friendly manner with a multilocation research team, aiming for a more sustainable academia (e.g., reducing fossil fuel use in research practices)?
2. What insights do the case study provide about the wellbeing of young people and the planet, and how can both be supported simultaneously?
3. Do sustainable and educational environments enable young generations to deepen their understanding of biodiversity, sustainability, and climate change or learning to use natural resources in a sustainable and ethical manner, including their own sustainable employment?

To answer these questions, we present the main research about youth inclusion in the following sections, including those related to NEET, sustainability, and gardening practices in Morocco. We then detail our methodological approach and findings. To conclude, we discuss our results regarding the dimensions of the planetary youth research framework.

2. Previous Studies on the Research Theme

Our literature review focuses on youth inclusion and sustainability and how they are experienced in the Moroccan context, which is characterized by several opportunities and challenges.

2.1. Experiencing Youth Inclusion in Morocco

Adolescence is a phase of life between childhood and adulthood—a transition from being cared for to a world of responsibilities and independence. However, the experience of adolescence is diverse, and young people form a highly heterogeneous group (Bayat and Herrera 2010). Additionally, factors such as gender, class, education, and place of residence influence young people's lives and opportunities (Bayat and Herrera 2010). Today, planetary crises also impact the lives of young people, especially those in vulnerable situations, such as those experiencing poverty (Borràs 2019). Among the most vulnerable,

NEETs (not in education, employment, or training) attract particular attention. The concept of “NEET youth” emerged in the mid-1990s to describe young people aged 15–29 who are excluded from work, training, and education.

The likelihood of becoming a NEET is higher for those with low levels of education, with the phenomenon being most prevalent among individuals aged 20–24. It is also more common among women (Alfani et al. 2023). For instance, by 2020, nearly 40% of young women aged 15–24 was classified as NEET, compared to only 14% of men (Statista Search Department 2024b). Additionally, boys tend to remain in school for approximately two years longer than girls, with boys averaging 7 years of schooling compared to 5 for girls (Statista Search Department 2022). The gender gap in the labor market is also notable. For example, in 2021, the female labor force participation rate was just 21% (Kolovich and Ndoye 2023).

NEET status tends to be persistent, as re-entering the labor market after prolonged unemployment is challenging. Education plays a crucial role in reducing unemployment and significantly improves women’s employment prospects. Addressing youth unemployment requires investment in preventive measures, such as improving educational quality, reducing dropout rates, and facilitating the integration of young people into the workforce. Long-term unemployment, which disproportionately affects women, leads to significant underutilization of educational capital, leaving many educated women without jobs (Alfani et al. 2023).

In Morocco, the lives of young people are shaped by various ideologies and traditions, including Islam, which emphasizes traditional values, family, and morality, alongside neoliberal capitalism, which promotes consumption, individuality, and constant growth (Feixa et al. 2022; Onodera et al. 2020). The country has 5.9 million young people aged 15 to 24, representing 16.2% of the total population in 2021. This demographic potential offers invaluable dynamism and creativity for the country’s development. However, social inclusion remains a major challenge for these young people. School failure, unemployment, poverty, and social exclusion are some of the obstacles they face.

In Morocco, 25.2% of young people aged 15 to 24 falls into the NEET category, showing a strong correlation with long-term unemployment and representing one of the highest proportions globally (Alfani et al. 2023; HCP 2024a). Youth unemployment has broader social implications, including delayed marriage and family formation, which are considered key indicators of social inclusion and success in Moroccan society (Onodera et al. 2020). Despite facing similar challenges, young people respond differently—some focus on work, education, or starting a family, while others consider moving abroad for better opportunities (Bayat and Herrera 2010; Onodera et al. 2020). According to the Arab Barometer (2019), up to 70% have considered emigrating. These economic hardships also contribute to growing dissatisfaction and hopelessness among young people. Although high unemployment may reinforce the stereotype of “apathetic” or “idle” youth, it does not necessarily reflect their aspirations, political views, or willingness to take action when opportunities arise (Author 4 et al.) Moreover, social networks significantly impact the lives and choices of North African youth (Onodera et al. 2020), with close relationships like family and friends, as well as the broader community, playing a crucial role in decisions, such as where to study and finding employment.

To address these challenges, the Moroccan government has made efforts to counter the exclusion and unemployment of young people. For example, youth entrepreneurship has become a focus in the region’s employment policies, aiming to transform young people into job creators rather than relying on employment from a shrinking public sector and slow-growing private enterprises. Numerous micro-enterprise support programs have been developed by state, international organizations, and civil society actors to achieve this goal (Jamali and Lanteri 2015). The Moroccan government has also introduced the auto-entrepreneur status to simplify administrative procedures and encourage young people to start their own businesses. Notable examples include the Forsa program, aimed at supporting 10,000 business projects by 2022, and the third phase (2019–2024) of the National

Human Development Initiative, focusing on employability and youth entrepreneurship. The government has also implemented “active labor market policies” (ALMP) through ANAPEC (National Agency for the Promotion of Employment and Competencies), which includes several programs. These initiatives have contributed to job creation and improved employability, developing a value proposition for different categories of jobseekers, including NEETs, as part of a multiactor system.

The government’s new national employment strategy specifically addresses the situation of young NEETs as a key public policy focus. It aims to promote the socioeconomic inclusion of young people in vulnerable situations through support processes and active involvement in creating extensive networks and connections with the business world. This networking helps them find decent job opportunities and positively contributes to the desired societal change ([International Labour Organization 2022](#)).

While youth inclusion efforts are often dominated by state programs, the case study in this article highlights an initiative led by civil society in collaboration with state agencies. This approach suggests an understanding of social inclusion that emphasizes society’s role in creating its own inclusion mechanisms, beyond state integration programs, allowing individuals to find their place within the social system, regardless of their physical or social conditions ([Printz 2020](#)).

2.2. Environmental Sustainability and Gardening in Morocco

Environmental sustainability is a key pillar of sustainable development, alongside social and economic dimensions ([Garren and Brinkmann 2018](#); [Moldan et al. 2012](#)). It involves principles and practices aimed at protecting biodiversity and the natural environment for future generations. Key principles include the sustainable use of natural resources, such as using renewable energy to reduce reliance on fossil fuels, ecosystem protection (e.g., conserving forests, oceans, and soils), waste minimization through reduction and recycling, pollution reduction, and climate change mitigation ([Garren and Brinkmann 2018](#)).

The concept of environmental sustainability has been operationalized through the framework of planetary boundaries ([Rockström et al. 2009](#)). This framework outlines nine Earth system processes (e.g., climate change, biosphere integrity, and land-system change) that are critical to maintaining the Earth’s stability and are threatened by human activities. These processes have measurable thresholds, which, if exceeded, can cause catastrophic environmental changes. Six of these boundaries have already been crossed ([Richardson et al. 2023](#)), including climate change and biosphere integrity (formerly biodiversity loss), and these boundaries are interlinked.

Environmental sustainability can also be addressed from the perspective of ecosystem services. According to the [Millennium Ecosystem Assessment \(2005, p. 2\)](#), ecosystem services are closely tied to sustainable development, particularly environmental sustainability. Ecosystem services are the benefits that people derive from, and depend on, natural ecosystems. These services result from interactions between living organisms, such as microbes, plants, and animals, and contribute to human wellbeing. They can be divided into four categories: provisioning, regulating, cultural, and habitat services. Provisioning services come directly from ecosystems, providing essential human needs, such as freshwater, food, raw materials, and medicines. Regulating services are vital for the functioning of the Earth, including climate regulation, water purification, and pollination. Ecosystems also provide non-material services, known as cultural services, such as recreational, educational, and aesthetic values. Finally, they provide habitat or supporting services, which are essential for ecosystem functioning. These include biomass production, nutrient cycling, photosynthesis, and the maintenance of biodiversity ([Millennium Ecosystem Assessment 2005](#), preface, pp. v–vi). In this article, we also investigate what kind of ecosystem services the Gardening School involves.

In Africa, aridity and high temperatures make the continent highly vulnerable to climate change ([Adare 2018](#)). North Africa, including Morocco, has a predominantly Mediterranean climate. Morocco’s diverse natural landscapes include mountainous terrains,

arid deserts, and extensive coastlines. The country is already experiencing the early effects of climate change, notably decreased precipitation. The implications include higher temperatures, increased aridity, the expanded desertification of the Sahara, and more frequent extreme weather events. With over 1800 km of coastline, Morocco also faces the threat of sea-level rise, endangering major coastal cities, like Casablanca, Rabat, Tangier, and Agadir (Van Praag et al. 2021, pp. 42–46).

Climate change significantly impacts Morocco's human and ecological systems, particularly food security and agricultural productivity (Van Praag et al. 2021, pp. 42–46), including ecosystem services. By 2050, temperatures are expected to rise by 2–3 degrees, while rainfall may decrease by 10–20%. Water resources are threatened by rising temperatures, reduced rainfall, and increased evaporation (Wuillez 2019). Water scarcity especially affects poor populations, who often work in precarious agricultural conditions (Schilling et al. 2012). The agricultural sector employs about 30% of the population and contributed approximately 10% to the GDP in 2022 (Statista Search Department 2024a).

Gardening is also connected to environmental sustainability, as it is directly linked to climate change, biodiversity loss, and ecosystem services. Changes in temperature, reduced rainfall, and more extreme weather events can affect growing seasons and species' ability to thrive (Nassif and Tanji 2017). Additionally, gardening can sequester carbon dioxide, helping to mitigate climate change and adapt to changing conditions (Lal 2016). Therefore, gardeners need to understand climate change and biodiversity loss to respond effectively. Key strategies for drought preparation include conserving and using water efficiently, choosing crops that require less water, and using gardening practices that improve soil health, such as composting and cover cropping, which can enhance soil's carbon sequestration capacity (Lal 2016).

Climate change also threatens biodiversity by altering habitats and ecosystems. Gardens that prioritize native and diverse plant species can create vital habitats for local wildlife and support biodiversity conservation (Isbell et al. 2011). Additionally, diversifying crops can benefit pollinators, which are also at risk due to climate change. Pollinators are essential to ecosystems, aiding in the pollination of plants and crops, but their decline has been observed in both wild and domesticated populations. The loss of pollinators is thought to be driven by climate change, biodiversity loss, and chemical use. Pollutants can have significant environmental and economic impacts, affecting ecosystem stability, food production, food security, and human wellbeing (Potts et al. 2010).

Moreover, the importance of green spaces in urban areas has been highlighted for several reasons. They play a crucial role in carbon sequestration, as plants and trees absorb carbon dioxide and store it in the soil. Urban areas, with dense development and concrete surfaces, tend to be warmer than the surrounding countryside due to the urban heat island effect. Green spaces help cool cities and provide shade (Gunawardena et al. 2017; Raj et al. 2020).

3. Materials and Methods

3.1. Moroccan Case "Gardening School"

This case study examines the first vocational school in Morocco that offers professional training in gardening. It was established in 2018 by a Spanish Islamic Foundation in collaboration with a Moroccan local agency, the Ministry of Vocational Education and Training, and other project supporters, including various international organizations and development institutes. The school is part of an international network dedicated to cultural landscapes in the Mediterranean and Middle East regions. It brings together 23 countries with the aim of preserving and enhancing cultural and natural heritage, while promoting sustainable development.

The school received initial funding from some of these organizations for the construction of the building, landscaping of the site, and the equipment needed to start the training program. After this initial phase, the school is working to become financially self-sufficient. To achieve this, it launched several activities, including a restaurant, a plant

nursery, training room rentals, training for individuals, and the publication and sale of specialized books.

The project targets young people at risk of exclusion, particularly those in marginal or precarious situations. The school is located in an area with high levels of unemployment, especially among young people and women. It was created to prevent vulnerable young people by offering them training, employment, and, beyond that, socioeconomic prospects. The school provides transportation, free training, and lunch to students. Despite these efforts, many young people drop out before completing the three-year training program, because their families need them to work immediately, often in more precarious conditions.

The trainees are aged between 14 and 28 years old, 20% of them are girls. Most join the school through informational tours organized by the school in the region or through word-of-mouth from their social networks. The training program lasts three years and includes ecological gardening through theoretical lessons, practical experience, and internships. The first year focuses more on practical training, such as learning French. From the second year onward, the curriculum emphasizes environmental and ecological practices, gradually integrating trainees into professional life and partnerships. By the third year, the program deepens this focus, preparing trainees for their future careers as ecological gardeners. After each year, trainees achieve different qualifications: a vocational training certificate (DSP) in the first year, a specialization diploma (DQP) in the second, and a qualification diploma (CAP) in the third. In December 2020, the first class of the Gardening School received their CAP "Certificate of Professional Learning." In total, 329 trainees registered for the three levels of training (CAP, DSP, DQP) during the five years of the school's existence, of which 264 completed the program, representing an overall success rate of 80.2%.

Besides supporting youth in vulnerable situations, the school's main objective is to instill an innovative and environmentally friendly model of gardening. To achieve this, the school faced an initial challenge of settling and rehabilitating a reclaimed site that was previously an illegal landfill on the outskirts of the city. The school's buildings are bioclimatic and powered by solar energy. Alongside its training program and extracurricular activities, the school promotes environmental awareness by advocating for ecological practices. It hosts visits from university students, the National School of Architecture (ENA), holds annual workshops on agroecology for children and adults, and organizes events focused on the architectural ecosystem. It also aims to raise awareness among the general public, architects, landscapers, and authorities about sustainable gardening practices, respectful coexistence with nature, and the challenges of climate change. Additionally, the school maintains a large nursery and protects endemic plant species. For all these reasons, we wanted to study more in detail by inquiring what kind of a unique model the school represents of sustainable growth, providing opportunities for both young people in vulnerable situations and the natural environment in an era of climate change.

3.2. Teamwork and Analysis

The article contributes to multidisciplinary global youth research, bringing together researchers from Morocco, Algeria, and Finland in a fruitful collaboration. It combines research, analysis, and co-writing while bridging social sciences and business studies with researchers at different professional levels. By reflecting this global and multidisciplinary working method, the article explores new ways to collaborate in an environmentally friendly and productive manner within a transnational research team.

Three of the article's four authors visited the school to observe and learn about its activities and practices. Salma Idrissi Boutaybi conducted on-site interviews in Arabic and French in June–July 2024. These semi-structured interview themes were designed with the entire research team, and they covered a range of topics, including school performance, challenges, ecological education, trainee recruitment, and the obstacles trainees face in graduating and finding employment. Additionally, the school's website served as a supplementary source of additional information.

After the interviews, we divided the transcription work: Yahia Benyamina transcribed the Arabic interviews, and Tiia Hartikainen handled the French interviews. Finally, we translated all the interviews into English. The interview data consisted of eight interviews with trainees (four females and four males), four with trainers (one female and three males), and three with administrative staff (two females and one male). Most trainers at the school were under 29 years old, so in youth studies, they were considered young adults. This allowed us to analyze their experiences not only as trainers but also as examples of youth transformations from education to employment. Notably, three out of the four trainers interviewed were graduates of the Gardening School.

Clear communication and coordination, led by Sofia Laine, were key to the project's success. We accommodated time zone differences in our virtual meetings and used project management tools, such as shared documents and a WhatsApp group, to maintain effective collaboration. The research team used Zoom meetings to plan the project. Each member brought a unique role and perspective to the case study, which enriched the collaboration. The diversity of the team allowed for a broad range of insights, combining perspectives from different disciplines and countries. Addressing the climate crisis requires systemic change, and contributing effectively to it requires a team with diverse knowledge and understanding. Regarding contextual knowledge, Moroccan researcher Salma Idrissi Boutaybi had the most direct understanding of her local context, making it easier for her to gather relevant data, understand cultural nuances, and access local networks. Algerian researcher Yahia Benyamina, with regional and historical ties to Morocco, brought cultural familiarity, while offering a slightly more distant regional perspective. Finnish researchers Tiia Hartikainen and Sofia Laine added a global and comparative dimension, complementing local insights.

Working in a multicultural team facilitated the exchange of ideas and methodologies from different academic traditions, fostering innovative research approaches. Exposure to different research environments and ways of conducting research helped each team member adapt and collaborate more effectively. Our approach to this research project was part of a deliberate plan to explore more ecological and sustainable research methods, including reducing travel and exploring alternatives that support environmental sustainability. Youth researchers should also consider how to revise their working methods to avoid using resources that should belong to future generations.

English served as the common language for communication, allowing us to continue writing the results smoothly. However, translating documents and interview data presented challenges. Translating the interviews from a specific Moroccan Arabic dialect to English was particularly difficult. We aimed to preserve as much meaning as possible when translating the informants' speech into standard Arabic and then into English, with the help of two Arabic-speaking authors, Salma Idrissi Boutaybi and Yahia Benyamina, who share cultural backgrounds with the respondents. The French-speaking interviewees' native language was not French, so their interviews occasionally included Arabic words. This created challenges in transcription and translation, as Tiia Hartikainen does not speak Arabic. In such instances, she interpreted the context of the conversation, and her Arabic-speaking colleagues reviewed the translations for accuracy.

Data processing followed reliability coding, a type of thematic analysis with a positivist orientation that emphasizes procedures to ensure objectivity, reliability, and accuracy of coding, while controlling for "researcher bias" (Braun and Clarke 2022; Nowell et al. 2017). We began by familiarizing ourselves with the data through transcription and reading, then produced preliminary coding. This coding was data-driven but aligned with our two main themes: youth inclusion and environmental sustainability. We grouped the initial codes into broader themes, refining them into main themes and subthemes, which are systematically explored in the findings chapter. Finally, we analyzed the themes in relation to the research questions and theoretical framework. To ensure reliability, each team member independently read the interviews and generated codes and themes. We then met to discuss and compare our interpretations of the data. This process helped us validate codes

and themes that aligned across the team and refine those with differing interpretations. Encouraging diverse opinions within the team was a crucial part of this process.

We also paid special attention to ethical issues related to representation and voice, carefully reflecting on whose voices were amplified in the research. We made efforts to ensure that the perspectives of local researchers and communities were not overshadowed by external viewpoints. All ideas were discussed openly, and we aimed for consensus on each issue that arose.

4. Findings

4.1. Youth Inclusion Perspective

4.1.1. Coming to School: The Importance of Networks

The Gardening School was originally designed to provide an educational opportunity for those classified as NEET (not in education, employment, or training) who have faced challenging life circumstances. However, the data indicate that a diverse group of young people enroll in the school. These young people come from three distinct backgrounds: those facing challenging circumstances who have dropped out of previous education (NEET youth), those who join through their networks (friends and family), and those with a genuine motivation to pursue a career in the field.

A significant proportion of trainees have a NEET background, often having left primary or secondary education. Some trainers cited learning difficulties as the reason for leaving school, while others mentioned the need to support their families financially as the reason for their early departure from the education system.

“I dropped out of school when I was in the sixth grade to help my family.” (Trainee 3, male, 26 years old)

“I repeated the years a lot, I repeated them three times, so I stopped. It’s not that I didn’t like studying or that I had problems with the teachers, but that I had difficulties with learning. After I left school, I joined the Gardening School; I didn’t stay on the street.” (Trainee 4, female, 18 years old)

Another path to discovering and enrolling in the school was through the networks of young people or their parents, as revealed by the interviews. Additionally, a significant proportion of them live close to the school, meaning that neighborhood networks have also influenced their enrollment decisions. Our findings align with previous research showing that young people’s social networks play a significant role in their education and employment decisions (Onodera et al. 2020).

“I was in 4th grade but unfortunately, I did not succeed. It was my father who knew about the Gardening School and advised me to join it, so I came and enrolled after six months of my failure at school.” (Trainee 5, male, 18 years old)

“The children of the neighborhood were studying at the Gardening School, and they were talking to me about it, so I came and enrolled myself in it after informing my mother.” (Trainee 6, female, 16 years old)

Trainees also differ in their initial motivations; some are driven by a genuine interest in gardening, while for others, it may be an opportunity to gain a degree and improve their employment prospects. The interviews revealed that the trainee group is notably diverse. The age range extends from 14 to 28, and their educational and skill levels vary widely. Some struggle with reading and writing and have only a primary school diploma, while others have completed high school. Some also have prior work experience, having helped their families from a young age. Below are two quotes from trainees with different backgrounds and motivations: one from a girl who completed high school and had an interest in gardening before joining the school and another from a boy who dropped out and worked from a young age to support his family:

“A first-year teacher knows my father and he informed him about the school. He asked if any of his children wanted to continue their education, and my father

suggested the idea to me, and I liked it. Initially, I had a penchant for gardening, plants, and nurseries, and the offer suited me well. In fact, I wasn't looking for training, it was just a desire until an opportunity presented itself and I went to school." (Trainee 8, female, 21 years old)

"I dropped out of school when I was in the sixth grade to help my family. I trained as an electrician at the Vocational Training Institute and then worked with someone for six months. I didn't like the job because I'm allergic to dust. Then, I wanted to work in the hotel industry. I worked there for a while, but I didn't like it either. I worked in weddings with a woman for eight years, and I met some people who told me about the Gardening School and that they could find me a good job. I had no idea about the field, and I wasn't enthusiastic about it, so I said I'd try it for a year." (Trainee 3, male, 26)

The school provides access to vocational education and training without requiring a school leaving certificate, offering people from various backgrounds the opportunity to study and earn a vocational qualification. In interviews, trainees and trainers described the school as flexible and understanding of different life challenges. For example, one of the trainers, a former trainee, shared that she received support and understanding when she needed to care for her ill parents:

"I was in the 4th grade, and I had stopped my studies for two years and I was staying at home because of my parents' illness. So, I stopped and did nothing until I heard about this school, which does not require a high level, such as the baccalaureate or a certain age. It required only the ability to read and write. So, I wanted to try. The study time was from 9 am to 4 pm, and that suited me because, as I said, my father was sick and I was taking care of him, especially since the school gave me flexibility in attending practical lessons." (Trainer 2)

Interviews revealed that the diversity among trainees, such as age and educational background, also presents challenges at the school. Some trainers and administrative staff noted that differences in age and motivation can impact trainees' commitment to education and their likelihood of staying in the field after graduation. Some trainees also identified age differences as a challenge, with one suggesting that "*classes should be homogeneous in terms of the age of the trainees*" (Trainee 13, female, 20 years old). These challenges may also stem from differences in educational backgrounds, and addressing these disparities could support better learning outcomes and experiences for trainees at various levels.

4.1.2. Importance of Social Support in Reducing Dropouts

The interviews indicate that trainees begin their studies in Gardening School from markedly different backgrounds, with some driven by a desire to become gardeners, while many are primarily motivated by the school's ability to provide a degree and employment opportunities, even without a secondary school qualification. However, the school has faced challenges with trainee dropouts. A common reason for leaving is the need to provide financial support to their families, who are struggling to make ends meet or require assistance due to ailing parents. According to an employee, the most common time for trainees to leave is after about two years.

"I think that the reason for dropouts must be that the training is three years. The ministry proposed a 4-year training program. We advocated for reducing the training duration to 3 years. However, I still find that 3 years is a lot for a young person in a vulnerable situation and poverty, even if we provide lunch, a bus pass, and the training is free. But 3 years at school without contributing anything to the family is a lot for a young person from this kind of background. That's why they drop out after 2 years." (Administrative staff 7)

Despite this, school employees have made efforts to understand the reasons behind dropouts and to support young people in staying enrolled. One trainer emphasized that providing social support is, in his view, the most crucial way to help young people continue

their education. He explained that trainers strive to build strong connections with trainees, listen to them, understand their challenges, and offer support during difficult times. The trainers also noted that their own backgrounds have been beneficial in providing this support, even though they lack specific training in social support.

“The training is there, but the most important thing is how to deal with the social problems of the trainees. So, on the one hand, I try to impart technical knowledge about gardening and agriculture, and on the other hand, I try to play the role of an educator. Fortunately, I have lived in difficult conditions, which has allowed me to understand and deal with the trainees’ problems.” (Trainer 10)

Even though there is no specific training for providing social support, trainers explained that the ability to do so develops naturally with experience and stems from a genuine desire to help. One trainer also mentioned that offering assistance and sharing social support is influenced by his religious beliefs, particularly those associated with Islam.

The trainee interviews revealed that trainees generally hold a positive view of the trainers and other school staff and are satisfied with the support they receive. For example, one trainee had a difficult experience during an internship and initially felt that the school did not provide enough support, leading him to consider dropping out. Ultimately, the school staff persuaded him to continue his studies, a decision he later viewed positively.

“Because of this problem, I did not think about returning to school and completing my third year until some people contacted me from the school and convinced me to return and promised to help me find a job later. So, I did not regret coming back. On the contrary, I benefited a lot from the third year and learned many new things.” (Trainee 3, male)

4.1.3. Diverse Paths and Obstacles for the Youth in Integrating into Working Life

The trainee interviews revealed a strong desire among students to secure employment in their field of study yet highlighted conflicting views on the role of school staff in this process. Trainees expected the school to facilitate their job search, while staff believed they should offer support but not take full responsibility for finding employment. One employee, who assists with job searches, expressed concern that pre-arranged jobs might hinder the development of work skills and motivation. She prefers that young people network independently with clients, fearing that her support may unintentionally create a sense of dependency among the trainees.

The school aims to develop young people’s work skills by offering support, such as helping them create CVs, preparing them for job interviews, and designing business cards. Trainees also participate in discussions about their future aspirations, motivations, and career goals, including the possibility of entrepreneurship, which becomes more common, with programs promoting self-employment as a viable career option (Santos-Ortega et al. 2021). NEET youth could also benefit from a similar support system to that available to other Moroccan entrepreneurs (Robichaud et al. 2023). Interviews with staff revealed that young people are encouraged to consider entrepreneurship and are informed about what it entails. Several trainees mentioned their aspirations to start their own business or project after graduation.

“I will see if I can get a job to gain experience in this field, then I think about starting a cooperative project with my friends.” (Trainee 13, female, 20 years old)

“I wanted to get my baccalaureate and become a self-employed entrepreneur in eco-commerce.” (Trainee 5, male, 18 years old)

The trainee interviews also revealed a strong desire or need to provide financial support to their families after graduation. Some trainees expressed a need to contribute to their family’s financial stability, while others wished to reciprocate the support their families provided during their education.

“My family really wants to see me grow and become independent. But personally, I think beyond my gardening work, to support and give back to my family who has helped me so much.” (Trainee 8, female, 21 years old)

4.1.4. Gender Sensitivity and Support for Girls in the Gardening Profession

The data revealed a notable gender disparity within the Gardening School, with 20% of trainees identifying as female. Female participation has been relatively low, with only 65 female enrolments (19.8%) and 56 female graduates (21.2%). However, women outperformed the overall average with a success rate of 86.2%, highlighting their strong performance despite limited representation. The 2021–2022 academic year recorded the highest program success rates, with 89.3% for the second year (DSP) and 90.9% for the third year (DQP), showing significant improvement. In contrast, the 2022–2023 period registered the lowest results. While these trends highlight the overall effectiveness of the programs, they also highlight opportunities to improve women’s participation and ensure consistent performance across the years.

The interviews showed that the physical strength required by gardening activities forced many girls to leave school. A current trainer, who is also a former trainee, mentioned that some of the female trainees she studied with chose to leave the program voluntarily and not because of pressure from their families.

An employee also highlighted challenges in employing and integrating girls into the workforce, as societal beliefs in Morocco often discourage women from engaging in physically demanding jobs like gardening. Additionally, one trainee expressed concerns about how clients might perceive her as a hijab-wearing woman in a male-dominated industry:

“At school, I have no problems, but afterwards, I believe that as a veiled girl, I will have problems with clients.” (Trainee 8, female, 21 years old)

The gender-related challenges in education and employment identified in the interviews align with findings from other studies in Morocco. For example, [Kolovich and Ndoye \(2023\)](#) estimate that prevailing gender norms, attitudes, and societal values influence women’s employment opportunities and the types of roles they can secure.

In response to female trainee dropouts and the subsequent difficulties in finding employment, efforts have been made to identify positions within the sector that correspond to their skills and abilities. While some female trainees are not deterred by the physical demands of the work, school staff have explored alternative options for those interested in pursuing a career in the field. For example, girls have been encouraged to explore roles in environmental monitoring, nursery garden work, and environmental education. The school has supported these efforts by encouraging female trainees to take on leadership roles in school-led workshops, such as hosting student visits. One trainer commented on the issue:

“They [girls] can do things in this field that do not require strength, such as inventorying the needs of a client’s garden and what they need or even presenting a specific design for the garden. This requires innovation and more ideas than muscles.” (Trainer 2)

4.2. Environmental Perspective

4.2.1. Ecological Gardening Practices as a Path Towards Environmental Sustainability

Awareness of ecological aspects emerged as an important subtheme in the trainees’ discourse. Trainees expressed that they have developed a range of skills related to ecological gardening techniques, including extensive knowledge about plants, their growth conditions, and their ecological significance. They have also gained proficiency in areas such as ecological and organic agriculture, plantation techniques, irrigation, nursery management, and pruning. Additionally, trainees have learned about waste management, soil rehabilitation, and the identification and management of beneficial and harmful diseases. Reflecting on the ecological emphasis of the program, one trainee noted, “This field is booming, and

by 2030, there is a huge project to make Morocco's major cities green" (Trainee 13, female, 20 years old).

However, a school employee described the situation as somewhat contradictory, noting differences in the learning outcomes of the trainees, particularly from an ecological perspective. According to him, the trainees' starting points and motivation influence their goals to learn and develop skills in ecological gardening.

"Some come to school just to escape... For example, from their home or to escape from their neighborhood or the critical social situation. They come to spend their time in the school, and then they leave. In this case, they don't really have a well-defined objective. The main interest is to satisfy the family and, of course, to get a diploma at the end of the program, and that's it. But of course, there are some trainees who are really interested in the profession. They're at school to learn. And of course, to get involved, to commit themselves to this profession [to learn environmental gardening practices]." (Trainer 14)

On the other hand, an administrative employee emphasized that there is a genuine commitment to teaching ecological practices to the trainees. He also mentioned that they have never had a case where a customer complained that the trainee was not green enough. He further suggested that the transfer of ecological knowledge and awareness is facilitated by skilled and motivated trainers. The objective of the training institution is to foster an understanding that environmentally friendly practices should be considered the norm, not the exception.

The data (interviews, school websites, and reports) also show that the school supports diverse approaches to environmental sustainability and ecosystem services. Trainees and staff share a similar perception of the school's environmental contributions, though they emphasize slightly different aspects. Trainees highlighted more concrete environmental benefits, while school staff emphasized not only these but also the importance of raising ecological awareness as a key part of the school's mission. As concrete examples of the school's ecological benefits, trainees mentioned various projects to clean up the environment, reduce pollution, improve air quality, and plant trees—efforts that are crucial for addressing climate change and biodiversity and are integral to ecosystem services. Since its foundation, the school has made it a mission to be actively involved in ecological practices, leading to the creation of a nursery to propagate plants best suited to the Moroccan climate. Alongside the trainees, the teaching staff has been involved in researching and collecting rustic species from several Moroccan regions, with the aim of reproducing them and offering them for sale, as well as integrating them into the landscaping plans developed by architects and landscapers.

In addition to these concrete projects, school staff emphasized that an important part of the school's activities is providing information on ecological practices to other groups, including children, young people, and adults. The school has also been working for several months on the design and publication of a book in Arabic and French, aimed at introducing individuals to ecological practices for ornamental and vegetable gardens. In this way, the school supports ecosystem services more broadly by promoting knowledge about sustainable gardening methods and encouraging self-sufficiency.

4.2.2. Environmental Attitudes and Awareness of the Ecosystem Actors

Educators and administrators emphasized the school's role as an information provider. They described various efforts to raise awareness of ecological issues and influence different stakeholders. The school organizes seminars and awareness campaigns for various target groups, such as schoolchildren, businesses, and architects, covering topics like ecological plants for urban planning, waste management, and water conservation. For instance, seminars have addressed subjects such as the amount of water required for grass growth and potential alternatives. Additionally, one employee highlighted that awareness campaigns have been conducted on radio, television, and social media platforms. These campaigns have also created employment opportunities for several trainees.

Many employees observed that, despite the challenges posed by climate change and biodiversity loss, many Moroccans, especially in the professional context, continue to prioritize economic growth over environmental values. One employee described this perception as a lack of “ecological spirit”, suggesting that some individuals may be more inclined towards financial activities than environmental protection. Additionally, staff members shared that many Moroccans might not fully appreciate the richness of their country’s diverse natural environment.

Interviews revealed workers’ concerns about the state of the environment and a genuine desire to make a difference. The interviews indicated that employees are driven by a desire to influence attitudes toward environmental respect and to raise awareness about biodiversity loss and climate change.

“I work to pass on environmental education in my courses and interactions with trainees, taking into account global changes in consumption. Therefore, awareness work among trainees is one of my important objectives and tasks.”
(Trainer 10)

While the school management and staff demonstrated significant awareness of the ecological emergency and the need to teach ecological practices and raise awareness of the planetary crisis, they also described this as challenging, as the following quote illustrates:

“So, it’s quite complicated to address the reality of young people in danger [vulnerable situations] and at the same time address another growing danger, which is the ecological emergency. That’s the big challenge we had and will continue to have in Morocco. That is to say, tomorrow in Morocco, even an average business leader in any sector will face this ecological challenge.” (Administrator 15)

Furthermore, an administrative employee observed that ecological work practices and values are divided, with the economic elite showing more interest in ecological values. This observation aligns with some research on the topic; although, the findings are mixed. Research indicates that people in wealthier countries tend to be more concerned about climate change (Franzen and Meyer 2010; Franzen and Vogl 2013). Education has been suggested as an explanatory factor, and employment status is also important. As individuals’ employment status improves, their concern for other issues, such as environmental concerns, tends to increase; whereas, unemployment has been found to reduce concern about climate issues. Conversely, Nauges et al. (2021) found that wealthier individuals are sometimes less concerned about climate change, as they may have greater means to adapt to and avoid its most severe consequences.

The administrator also argued that a shift toward more sustainable practices and the awareness of environmental vulnerability can originate from any sector or individual. He explained this with the following example:

“The trainees were trying to really understand that producing and setting up an ecological, aesthetic garden for a client could actually be something in demand. But the trainees didn’t believe it. They thought, ‘Why would I grow potatoes, tomatoes, or whatever? My father is a farmer, and I’ve seen him struggle. I never want to get into that.’ Then they saw that a diplomat’s wife, an ambassador’s spouse, asked them, ‘Could you set up a vegetable garden for me? I want to be self-sufficient in vegetables.’ This happened just after Covid. And then they started to realize and tell us, ‘Wow, it’s true. People are asking for this, and they want it.’ And so, this contributed to a certain awareness. To sum it up, awareness comes from the ecosystem. It can come from any actor within the ecosystem. It’s not just us, the school administration, driving this. It can really come from anywhere.” (Administrator 15)

Despite the challenges described by employees, trainees have felt valued in their field. Many have received positive feedback from the school’s collaborators. One trainee shared that she had the opportunity to interact with several distinguished individuals, including diplomats, princesses, and princes, who visited the school and praised the quality

of her work. She said that this recognition gave her more confidence and motivation to continue her work. Additionally, some partners have specifically chosen to collaborate with the school because they appreciate its core mission—to support young people in difficult situations and promote environmentally friendly practices.

5. Discussion and Conclusions

This study explores the unique case of a Gardening School that offers a pioneer program of ecological gardening practices to young people, especially NEET ones. We examine how the school supports the inclusion of young people and the wellbeing of nature using a new planetary youth research framework.

This research is a concrete example for a successful collaboration between researchers from the Global South and the Global North, based on respect and the complementarity of knowledge perspectives (social sciences and business studies) and technical competencies (e.g., academic writing, data analysis, and translation), thus contributing to a more global and inclusive research production, supporting knowledge production in the Global South that gives greater recognition to Southern theories and allows them to take on a new role.

Methodologically, crossborder collaboration can offer significant benefits, such as diverse perspectives and local–global expertise. However, it can also present logistical, political, and cultural challenges that need careful management for successful research outcomes, especially for a multilocation research team, aiming for a more sustainable academia (e.g., reducing fossil fuel use in research practices). In our project, we designed a research setup that gave each researcher a unique role and perspective. We aimed to explore whether it is possible to reduce travel and look for alternative methods that would support more ecological and sustainable approaches to youth research. Our evaluation is that we succeeded quite well on this, by conducting more global youth research in an ethical and environmentally friendly manner for a sustainable future.

In the era of climate catastrophe, it is crucial for societies to create more sustainable opportunities and employment possibilities for future generations. Like many countries in the so-called Global South, Morocco has a large population of children and youth yet struggles to provide employment opportunities for every young adult. The country is also significantly affected by climate change (especially drought and heat) and biodiversity loss. In this article, we analyzed a case study we called the “Gardening School” that aims to address both of these major issues in Morocco—youth unemployment and the environmental crisis—by making ecological gardening practices the norm. The school is located in an area with high youth unemployment and was built on a reclaimed site that used to be an illegal landfill on the outskirts of a city, making it an important social innovation in the region that supports ecological practices, sustainable employment, and youth inclusion.

The school plays a key role in offering a sustainable and educational environment that enhances awareness not only for trainees but also for the external audience and many stakeholders. We found that the school teaches young trainees sustainable gardening practices for the era of climate change, encouraging a more respectful coexistence with the environment and each other. The training program proposes to address three key issues: the inherent dangers of current gardening practices, the growing scarcity of water, and the importance of ecological practices that respect the soil and living beings essential to a well-balanced ecosystem. Furthermore, the school is also actively involved in raising awareness among the general public, architects, landscapers, and authorities. Many initiatives are held on an annual basis with the objective of fostering interaction and collaboration between individuals and groups from different backgrounds. These include thematic training courses, educational visits, and internships for students from both domestic and international academic institutions.

The case study is an inspiring example of positive change, striving to influence Morocco’s approach to sustainability by promoting ecological practices and raising awareness. For example, during interviews, a seminar on trees, their ecology, and their role in urban

planning was highlighted. The administrator explained that, while gardeners may not directly influence urban planning, they can still have an impact by engaging with urban and landscape planners, as they have at the school. He gave the example of the palm tree, which may not be the most suitable for urban planting, as it provides little shade or fruit. This aligns with efforts by Moroccan civil society, in collaboration with environmental actors, to stop the planting of palm trees in urban public spaces. This campaign, conducted on social media, led to a decision by the authorities to replace palm trees with *Platanus* trees starting in October 2024. Our study found that the Gardening School is a unique model for promoting sustainable and natural growth for both young people and the environment in one of the climate change hotspots.

The study also identified connections to all four aspects of ecosystem services: provisioning, regulating, cultural, and habitat services ([Millennium Ecosystem Assessment 2005](#)). The school supports provisioning services by promoting the sustainable use of resources, such as water conservation and tree planting, and by fostering food production and self-sufficiency. In terms of regulating services, the school encourages green spaces and tree planting, provides information on the sustainable use of plants in urban planning, and helps increase carbon sinks. It also plays a role in protecting biodiversity, which is crucial for supporting pollinators. From the perspective of cultural services, the school contributes by educating trainees and other stakeholders about environmental sustainability. Gardening also enhances the aesthetic and recreational value of nature, making urban areas more attractive and improving people's wellbeing. Finally, the school's ecological gardening practices support habitat services, which are fundamental to the functioning of the Earth and the basis for all other ecosystem services. This includes efforts to maintain biodiversity, support the food cycle, and combat climate change through nursery gardens, tree planting, the promotion of healthy soils, and participation in sustainable transformation.

Our study demonstrates also that the school enhances young people's understanding of ecological crises and teaches them how to take action towards building a more sustainable world. Trainees act as ambassadors, disseminating their newly acquired knowledge to their families, friends, and colleagues in the workplace. They are also oriented to entrepreneurship as a carrier option, instead of waiting for a job. This might interest many of the trainees who already have an entrepreneurial mindset. Actually, the training provided by the school was deemed insufficient to enhance the entrepreneurial abilities of its trainees. However, it introduces them to the concept of self-employment by encouraging newly graduated trainees to seek out customers and manage small projects by themselves.

However, our study found that the school faces challenges with student dropouts, often due to the financial pressures young people face in supporting their families. Our data suggest that the social support provided by the school can help young people stay in the program and complete their education. It also shows that many young people have a clear desire to remain in the sector after graduation. However, the school has found that girls sometimes face difficulties finding jobs in the sector due to negative attitudes towards women working in physically demanding fields. In response, the school has worked to create a variety of opportunities within the sector and has supported girls in finding employment, such as roles as environmental educators and monitors. Additionally, it is examining the potential for introducing new training programs in ecological animation, a field that is experiencing a considerable demand from educational institutions and youth activity centers and could offer several opportunities for girls after graduation.

All these facts demonstrate that our case study contributes to all four dimensions of the planetary youth research framework, serving as an example where different dimensions intersect. By grounding our research in this framework, we aim to support the living conditions of future generations and suggest great potential for youth research to explore new methods of working with young people, especially in sustainable and educational environments, thus enabling young generations to deepen their understanding of biodiversity, sustainability, and climate change and teaching them to use natural resources in a sustainable and ethical manner, including their own sustainable employment.

This case study shows also the importance of being a real “game changer” in education, environment, and employment, while also engaging in broader societal dialogues to amplify the impact on sustainable development. This case could be reproduced in other regions in Morocco, as well as in other countries around the world facing the same issues related to youth unemployment, climate change, biodiversity loss, and sustainability. However, a general challenge is that environmental crises are still not taken seriously enough in the majority of the world’s societies, and there is insufficient demand for ecological gardening services, despite their clear role in climate change mitigation and adaptation.

The Gardening School stands as an example of the sustainable change needed world-wide. While our study focused on how the school supports environmental sustainability and youth inclusion, other aspects, such as management and self-funding challenges, its role in fostering youth entrepreneurship, and its model as a social innovation, could be valuable areas for further research. Extending the study of Gardening Schools to a wider range of disciplines could provide deeper insights into these areas.

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