

The challenges facing rural population and the potential of sustainability of rural development in Morocco

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Abstract: Morocco, the fifth-largest economy in Africa, similar to its neighboring developing countries, its rural development is still a work in progress. However, during the last decade, the country has successfully reduced rural poverty and many other aspects relating to the physical and social infrastructures in these remote areas mainly by focusing on fostering agricultural development. The paper provided an overview of rural development and its potential sustainability in Morocco, relying on the journal articles, as well as the available data and censuses provided by the government. The results were organized into the four main pillars of sustainability to explore and examine the challenges facing rural population and development from the sustainability aspect. The review concluded that in the last decades, the government has successfully elevated and stimulated rural development. However, many challenges still face sustainability, mainly the high illiteracy rate which makes it harder to implement sustainable practices, and the infrastructure that is not yet sufficient to foster this transition.

Keywords: *Sustainable development, rural areas, rural population, rural development, Morocco*

JEL Codes: *O10, Q01, O18*

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Absztrakt: Marokkó vidékfejlesztési lehetőségei és kihívásai a fenntarthatóság tükrében, különös tekintettel a vidéki társadalomra – Marokkóban a vidékfejlesztési folyamatoknak mérhető eredményei vannak. Annak ellenére azonban, hogy az országot Afrika ötödik legjobban teljesítő gazdaságaként tartjuk számon – a szomszédos fejlődő országokhoz hasonlóan – Marokkó rurális terei további fejlesztésre szorulnak. Az elmúlt évtizedben az ország sikeresen csökkentette a vidéki szegénységet és sok más vonatkozó – pl. infrastruktúrával kapcsolatos – indikátor esetén javulást mutatott, amelyet főként a mezőgazdaságban történt fejlesztések előmozdításával sikerült elérnie. Jelen tanulmány átfogó képet igyekszik nyújtani a marokkói vidékfejlesztés fenntarthatósági vonatkozásairól a rendelkezésre álló szakirodalom vizsgálatának alapján, valamint a témában releváns népszámlálási- és egyéb szekunder adatok elemzésével. A vizsgálat során a vidéki terrek fejlődése előtt álló kihívásokat igyekeztünk feltérképezni végig szemelőtt tartva a fenntarthatóság négy fő pillérét. Megállapítható, hogy az elmúlt évtizedekben a marokkói kormány sikeresen ösztönözte a vidékfejlesztést, a fenntarthatósággal kapcsolatban azonban továbbra is számos kihívás vár megoldásra. A gyakorlati megvalósítást elsősorban a magas írástudatlanság, illetve az infrastrukturális hiányosságok akadályozzák a rurális tereken.

Kulcsszavak: fenntartható fejlődés, rurális terek, vidékfejlesztés, vidéki társadalom, Marokkó

JEL-kódok: O10, Q01, O18

Introduction, objectives

Developing economies – in which agricultural productivity plays a determinative role – may be particularly vulnerable to the effects of climate change. Based on the reports of the IPCC (IPCC, 2007, 2022) the currently unequal distribution of precipitation in the Mediterranean countries may become extreme in the future, so the frequently occurring drought during the vegetation period may be even more critical. In the case of Morocco, this issue is particularly problematic, since the proportion of employees in agriculture and the contribution of agriculture to GDP are quite high.

Since Morocco's agriculture is characterized by traditional patterns, a particularly important question is: which direction should be developed in the future? Can Morocco avoid resource-intensive industrial agricultural development and create a long-term sustainable agricultural structure – based on rural development – or not?

To achieve long-term sustainability, it is crucial to establish stable economic and social frameworks that align with environmental conservation. This requires addressing a supportive political environment is essential to enact policies and regulations that promote sustainability. A stable and flexible society can face successfully the impact of climate change. A well-organized society can receive and share information in time, has collective knowledge and memory, has appropriate adaptation capacity, able to reorganize itself from time to time. We try to measure the extent to which the Moroccan rural socioeconomic position meets these requirements.

There is no denying the fact that sustainable development is the key factor for climate adaptation and mitigation (Visseren-Hamakers, 2020). Therefore, Morocco has considered mainly sustainability a path for its development in rural areas in its primary sector, agriculture first via the Green Morocco Plan (2008-2020), followed by the Green Generation Strategy (2020-2030) (Elalaoui et al., 2021). The overall objectives of the review were to explore and examine the challenges facing the rural population and rural development in Morocco by investigating the social and physical infrastructures in rural areas, the rural population challenges from a sustainability point of view, and the relevance of more effort for environmental dimension in rural development. In addition to studying the past trends of rural development strategies with an emphasis on the current situation. The review also discussed Morocco's potential to promote sustainable rural development. Specifically, the study aimed to address the following research questions: What are the past trends and prospects for rural development strategies and rural population situation in Morocco? What are the challenges facing the population, emphasizing the socioeconomics aspect in rural areas? What are the challenges facing the transition to sustainable rural development? What are the applied and required adaptation actions, policies, and measures for rural prosperity?

Explaining the issue and relevant literature

In Africa, the population of its developing countries remains largely rural. Agriculture also constitutes one of the most prominent economic activities providing employment to a large population in rural areas. As rural areas are commonly defined either as areas that are not urban areas that usually vary in socioeconomic, institutional, sociocultural, and environment, or as

areas with low population density and depend for the most part on the primary sector (Atkinson, 2017; Chromý et al., 2011; Straka & Tuzová, 2016). At a more general level, the World Bank defined rural development as a strategy aimed at improving the economic and social life of a particular group of people, especially the rural poor (Chambers, 2013; Straka & Tuzová, 2016). Many factors can characterize rural development. For instance, rural development by Moseley (2003:4) is described as a sustained and sustainable economic, social, cultural, and environmental change aimed at improving the long-term well-being of the entire community (Moseley, 2003). Since rural areas are significantly impacted by climate change, the transition to sustainable solutions is a must to cope with current and future scenarios. As sustainable development is considered the key to climate change adaptation and mitigation. To achieve sustainable development under the current circumstances, rural development perspectives must consider several aspects such as quality-of-life improvement, reduced inequalities, rural resilience, sustainable agriculture, and circular economy (Atkinson & Atkinson, 2023; El Chami et al., 2020; Visseren-Hamakers, 2020). In terms of sustainable rural development concept, as it is underpinned by four basic pillars which are social, economic, political, and environmental. it is defined as a holistic approach where the day-to-day basic needs of rural populations are met through reliable public utilities in combination with technical, socio-economic, and environmental conditions to sustain regional economies, the links between urban and rural regions, and to improve resilience to economic shocks and environmental disruptions as a result of climate change (Mihai & Iatu, 2020).

Agriculture has been historically considered the main activity in rural areas. The vulnerability of the rural population to climate variability lies also in their dependence on agriculture. Since the temperatures will increase by about 1–1.5°C by 2050 (Dwivedi et al., 2022), higher temperatures will eventually reduce yields of desirable crops while encouraging weed and pest proliferation (Adeyinka et al., 2022). Developing countries are considered to be more vulnerable to climate change because of their reliance on low-capital agriculture with limited financial capacity (Lybbert & Sumner, 2012). In developing countries, Poor smallholder farmers are more exposed to climate risk due to their lack of adequate adaptive capacity (Archer et al., 2007). Nevertheless, in recent years, more developing countries have opted for sustainable agriculture (López-Sánchez et al., 2021). Sustainability in agricultural systems has improved food production and reduced food poverty in over fifty developing countries in

Africa, Asia, and Latin America by adopting low-cost, and locally available environmentally sensitive practices and technologies (Pretty et al., 2003). Sustainable agriculture is defined as an integrated system of plant and animal production practices that produce adequate amounts of high-quality food, protect its resources, and be both environmentally safe and profitable (Velten et al., 2015). In Morocco, agricultural development plans were among the first governmental plans to incorporate the transition to development, which implements and fosters sustainable practices in rural areas that are conducive to a thriving economy for its rural communities. As farming and related activities form the basis of rural life. The state has stimulated rural areas' economy mainly through investing in agricultural development and participating in international collaborative plans, including presenting the Initiative for the Adaptation of African Agriculture to Climate Change (AAA Initiative) in the run-up to COP 22 (2016) (The World Bank et al., 2018).

The paper conducted an overview of the challenges facing the rural population and development-related opportunities and challenges in Morocco, resulting in an exploratory review of rural development's current state and potential for sustainable development in rural areas. To address the mentioned research questions, the existing literature had to be relied upon to provide a comparative analysis of the past and current trends, as well as the evolution of rural development and the relevance of the transition to sustainability in Morocco. In addition, under the context of the significance of sustainability in rural development, the results were organized under three main subchapters: economic, social, environmental and political dimensions. Furthermore, it should be mentioned that the literature examined comes from three different languages: English, French, and Arabic.

Methodology, data sources

The main theoretical contribution of this work is to explore the productivity, sustainability, challenges, and opportunities at a qualitative and quantitative exploratory level regarding rural development, focusing on the challenges for sustainable rural development. Regarding the methodological approach used to examine the previous studies, this paper can be classified as a narrative review. Selected previous studies and findings are contrasted, summarized, and organized under three main subchapters to

provide a clear view of the state of rural areas in terms of development and sustainability challenges in the light of changes, past and current trends. The data source was derived from various data sources. Academic journal articles related to this research area that are included in this paper come from a variety of sources and web search engines such as Google Scholar, Scopus, and ScienceDirect. Including scientific papers deemed to provide clarity and a new perspective on the tackled topic. Given the nature of the topic, it was necessary to rely not only on the scientific articles that were published on the topic, but also, on official documents and reports that were released by different renowned sources such as the World Bank Group, the Organization for Economic Co-operation and Development (OECD), Food and Agriculture Organization (FAO), and World Resources Institute (WRI). In addition, the official documents, reports, and censuses issued by the state and government institutions were mainly included for their relevant information and statistical data to understand the current and past trends in sustainable rural development prospects. Another reason is the government's political view for a better understanding of the topic. The article relied on basic statistical descriptive methods such as percentages to clarify and simplify the data, for a better understanding of the issues discussed. The inability and/or difficulty accessing reliable and updated secondary data has been the main obstacle faced during this work.

Description, findings

Morocco is generally considered a country undergoing demographic, economic, and political transformation. To examine the challenges facing rural population and development from the sustainability aspect. It was necessary to investigate the fundamental pillars underpinning sustainable rural development. The explored sustainable rural development aspects are deemed to bring clarity to the current situation in rural areas of Morocco, rural development, and its sustainability. The economic dimension focused on the main economic activity in rural areas and the physical infrastructure to foster potential sustainable rural development plans. The social dimension was interested mainly in the social infrastructure, essentially education, poverty, and health coverage challenges, including essential equipment availability, and discussing the specificities of the nomadic

population in Morocco. Additionally, the work also explored the environmental and political dimensions. In the following, the results of the sustainable rural development review were organized into four basic pillars: economic, social, environmental and political dimensions.

Economic dimension

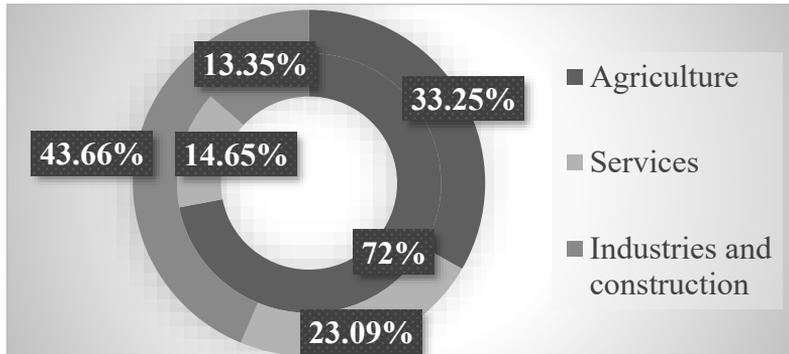


Figure 1: Structure of rural employment by sector of activity (%) (2019-2021) (national on the outside, rural on the inside)

Sources:(MAFM, 2021; MEFM, 2019)

Morocco, the third-largest agri-food exporter in Africa, still depends to a disproportionate degree on agriculture (Amiri et al., 2021). The sector accounts for 13% of the total GDP and represents about 35% of all employment with 72% of rural employment (MAFM, 2021), where the majority of the rural population still depends on agriculture for their livelihood. In addition, smallholders represent 70% of farms in Morocco, and close to 10 million people are involved, to varying degrees, in agricultural activities (MEFM, 2019). As agriculture is considered the primary economic activity in rural areas by figures in Morocco. The economic dimension of sustainable rural development cannot be achieved without the sustainability of agriculture in Morocco. In addition, the sustainability of this sector will boost the case to include sustainability in future rural development plans. The agriculture development strategy in Morocco, mainly through the Green Morocco Plan (2008-2020), followed by the Green Generation Strategy (2020-2030), was successful since the GDP from agriculture's average annual rate of growth has doubled reaching +5.25% (2008-2018) compared to the previous decade +2.5% (1997-2007) (MAFM, 2021).

And was achieved primarily by fostering the development of modern agriculture with high productivity and added value in the irrigated and relatively prosperous unirrigated areas, that meet the market requirement, through private investment (Akesbi, 2012). And secondly, by providing support to small-scale agriculture and improving the incomes of the most vulnerable farmers, particularly in landlocked areas (El Hassane et al., 2015; HCPM, 2020; Mengoub et al., 2021). However, climate variability substantially impacts this development. For instance, both 2020 and 2022 harvests are among the lowest recorded in the last 20 years as they were characterized by poor rainfall, in terms of amount and distribution. The cereal production of these two years was about 60 percent short of the previous five-year average and 38% to 70% below the prior year's harvest. In comparison, the 2021 cereal production was higher than the five-year average by over 60 percent. The season was characterized by a favorable rainfall, the precipitations were adequately distributed over time and space to facilitate sowing and early crop development (FAO, 2021, 2022).

Regarding gender equality and women's empowerment, based on the figures provided by the OECD, women's employment stands at 52.2% in the agriculture sector, mostly in low-wage job positions, which is the highest compared to the rest of the Mediterranean countries. The participation of women in the Moroccan labor market stands at 21.3% and is concentrated in the agricultural and industrial sectors. One of the explanations for the current situation is the fact that women's illiteracy rate is the highest in the country by gender. Additionally, about 17% of women in non-agricultural employment work informally. Gender equality in terms of access to education will help shift the current situation and boost economic development including in the agriculture sector (OECD, 2020, 2021). The mentioned facts constitute the main challenges for sustainable agriculture and the economic dimension of sustainable rural development that depends largely on the sustainability of the agricultural sector in Morocco.

In terms of physical infrastructure that would support sustainable development in rural areas. Thanks to the development of rural roads plans launched in the last decades, the rural roads accessibility rate increased from 34% in 1995 to 85% by the end of 2017. The government aims to reach 90% of the accessibility to rural roads by 2023 via the Program to Reduce Territorial and Social Disparities launched in 2017 (HCPM, 2018c, 2023). The electrification rate in rural areas is about 84.6%, close to the accessibility rate in urban areas of 95.2% in 2014. The country achieved an electrification rate of 91.6% (2014) (HCPM, 2018c, 2023).

Regarding the accessibility rate to the public water supply system in Morocco is approximately 73% (2014). However, it is tremendously low in rural areas (37.8%) compared to urban areas, which reached 91.3% (2014) (HCPM, 2018c, 2023). The drainage lines accessibility rate in Morocco stood at 58.9% nationwide and 88.2% in urban areas (2014). However, it is pretty low in rural areas, with only a 2.9% accessibility rate (2014) (HCPM, 2018c, 2023).

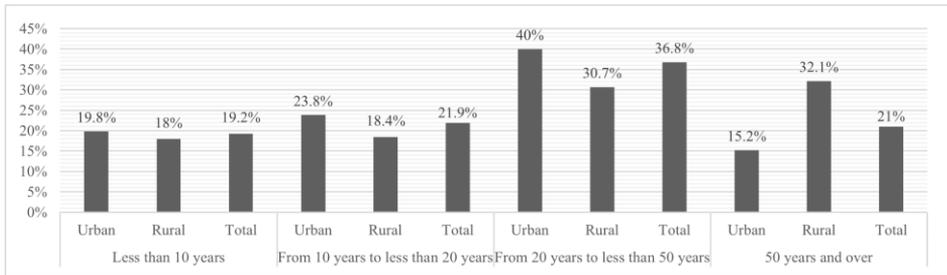


Figure 2: Household distribution by the age of housing in percentage (2014)
Sources : (HCPM, 2023; MNTP, 2019)

In terms of housing, the graph demonstrates that the rural population has the highest rate regarding the age of housing. In rural areas, 32% of housing is aged 50 years or over, making it less suitable for a living if it is not maintained correctly (HCPM, 2023; MNTP, 2019). As for ownership in rural regions is much higher than in urban regions (89.6% compared to 62.7% in 2014) (HCPM, 2018a, 2018b, 2018c, 2023). The rural population in Morocco tends to live in villages close to their extended family, sometimes in a large household located on the farmland where they collectively work and maintain the same agricultural land. In rural areas, houses are mostly traditionally built however, the newly built houses in rural areas tend to rely on more modern methods. The current physical infrastructure is not robust enough to facilitate the transition to sustainable rural development, as it was further demonstrated in the recent earthquake that hit the country on the eighth of September 2023, where a catastrophic number of the rural population died in the collapse of their traditionally built houses and the lack of emergency facilities located and provided for these areas (HCPM, 2018a, 2018b, 2018c, 2023).

Social dimension

Rural development is significant in Morocco since over one-third of the population lives in rural areas (39.63% of the total population resides in rural areas), which prompted the government and the institutions to invest in development projects and plans in these areas. Since the independence of Morocco, six population censuses have been conducted in 1960, 1971, 1982, 1994, and 2004, and the last census was in 2014. The population of Morocco is distributed into 1538 communes, which constitute the unit of local governments for administrative purposes. Moroccan communes comprise 256 urban and 1282 rural. In addition, the size of a commune varies between 55 and 520,428 people. The five main economic regions comprise about three-quarters of Morocco's total households. At the national level, the average household size decreased from 5.2 in 2004 to 4.6 in 2014, with an average annual growth rate of 2.59% in the number of households. The average household size was much higher in rural areas, with 5.3 in 2014 (6 in 2004), compared to urban areas, with just 4.2 in 2014 (4.8 in 2004). However, the average annual growth rate in the number of households in urban areas stood at 3.4% compared to rural areas, with only 1.2%. (HCPM, 2018a, 2018b, 2018c, 2021, 2023). The review tackled the following aspects: Illiteracy, poverty, healthcare, essential equipment availability, and the nomadic population in Morocco.

**Table 1: Illiteracy rates based on sex and place of residence
(Population aged 10+) (%)**

	Urban			Rural			Total		
	Women	Men	Total	Women	Men	Total	Women	Men	Total
1960			73%			91%	96%	78%	87%
1971	68%	43%	56%	98%	78%	88%	87%	66%	76%
1982			44%			82%	78%	51%	65%
1994	48.6%	24.7%	37%	89.1%	60.6%	75%	67.4%	41.4%	54.7%
2004	39.5%	18.8%	29.4%	74.5%	46%	60.5%	54.7%	30.8%	43%
2014	31%	14%	27.7%	60.1%	34.9%	50.9%	42.1%	22.2%	36.9%

Source: (Courbage, 1996; HCPM, 2018a, 2018b, 2018c, 2023; Robert Fosset, 1973)

The illiteracy rate in Morocco reached 32.2% based on the official figures of the last census of 2014. However, the illiteracy rate stood at 36.9% nationwide if people who didn't graduate from primary school (which is for children between the age of seven and thirteen) are considered. Rural areas have the highest illiteracy rate in the country reaching 50.9% (2014). In Addition, It is noteworthy to underline that, under law No. 1-63-071 (1963) education is compulsory for all Moroccans of both sexes (since 1963), from the age of seven until they reach the age of thirteen (HCPM, 2018a, 2018b, 2018c).

The table developed from the figures available from the government census results shows that the illiteracy rate is much higher in rural areas than in urban regions for both genders. For instance, the men illiteracy rate in rural areas was 34.9% in the last census, almost double and a half compared to 14% in urban regions for the same year. The same observation can be made for rural women (60.1% in 2014) compared to their urban counterparts (31% in 2014). The limited access to the institutions such as schools in rural areas could explain this disparity. Furthermore, the women's illiteracy rate is the highest, regardless of the place of residence. However, based on the previous censuses, the illiteracy rate is substantially decreasing, from 91% recorded sixty years ago to 50.9% in 2014 for rural areas. In addition, thanks to the various school social support programs and initiatives the enrolment rate in the rural areas reached before the pandemic in 2020, 47,4% for Preschool (between the age 4 to 7 years old), for primary school enrolment rate reached over 90% (between 7 to 13 years old), in middle school enrolment rate is 44,3% (between 13 to 16 years old) and 12,2% in High school (HCPM, 2022). Given the mentioned figures, illiteracy in rural areas is expected to decrease further in the current decade.

Poverty in Morocco has also substantially decreased in the last decade, thanks to the significant part of the development achieved via agriculture for rural farmers through the Green Morocco Plan (2008-2020), followed by the Green Generation Strategy (2020-2030). In rural areas, absolute poverty has reduced by over 5% between 2013 and 2019. However, absolute poverty has risen during the pandemic from 1.7% to 11.7% nationwide, from 0.5% to 7.1% in urban areas, and from 3.9% to 19.8% in rural areas. In terms of relative poverty, it constitutes 12.7% nationally, 6.8% in urban areas, and 22.9% in rural areas, reaching 4.5 million people, with two-thirds (66.4%) living in rural areas (2019) (HCPM, 2022). In 2019,

rural populations' vulnerability to poverty declined to 11.9%. During the lockdown, vulnerability to poverty has also increased from 7.3% to 16.7% nationally. Depending on the residence, these proportions range from 4.6% before the lockdown to 14.6% in urban areas and 11.9% to 20.2% in rural areas. Social inequalities also deteriorated and exceeded the socially intolerable threshold (42%). The Gini index reached 44.4%, corresponding with a high-income disparity, compared to 38.5% before the health crisis (HCPM, 2021, 2022). However, government support has mitigated the impacts of the Covid-19 pandemic. Public support for households has significantly reduced the effects of the lockdown on household living standards. At the national level, absolute poverty has decreased from 11.7% to 2.5% after government support. In urban areas, 7.1% to 1.4%, and 19.8% to 4.5% in rural areas. The Gini index, the most widely used measure of income inequality in a society, dropped from 44.4% before government support to 38.4%, about the same level as before the pandemic (HCPM, 2022).

Table 2: The rate of health coverage of the population (%)

	1991	1998	2001	2007	2014
Urban	23,7%	21,8%	21,1%	25%	44,5%
Rural	3,1%	3,8%	3,8%	3,8%	23,7%
Total	12,8%	13,5%	13,5%	15,8%	36,2%

Sources:(HCPM, 2018a, 2021)

The table shows that health coverage in rural areas tremendously improved in 2014 compared to the previous years. This improvement resulted from the RAMEd program's implementation in 2011, which targets economically deprived people not covered by any health insurance scheme (HCPM, 2018a, 2021, 2022).

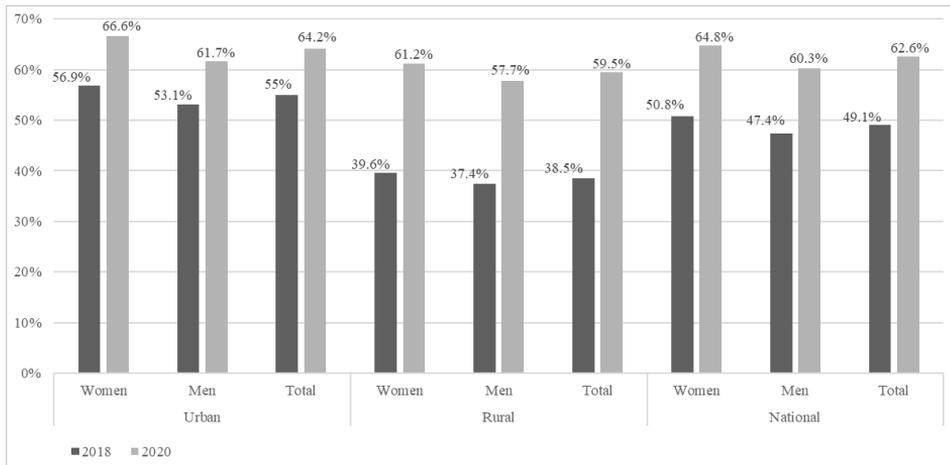


Figure 3: The coverage rate of the population aged 15 and over by health insurance (AMO and RAMED) (%)

Sources:(HCPM, 2021, 2022)

AMO is compulsory health insurance for Moroccan employees, paid by both employers and employees as a percentage of salary. The graph shows that health insurance coverage in rural areas reached about 60% of the total population aged 15 and over in 2020. In addition, women's health coverage in 2020 was 61.2% compared with 57.7% for men in rural areas (HCPM, 2021, 2022). In terms of maternal mortality in Morocco, it is perceived as 2.5 times higher in rural areas than in urban areas. As maternal mortality ratio stood at 72.6 per 100,000 live births for the period 2015-2016 nationwide. In rural areas, it constitutes 111.1/100,000 live births compared to 44.6/100,000 live births in urban areas. Nevertheless, maternal mortality decreased by 35% during the 2010 to 2016 period, with an average annual reduction rate of 7% (MHM, 2018).

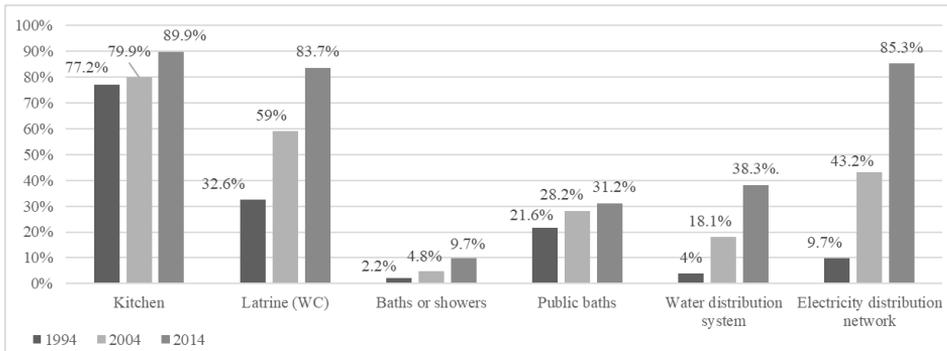


Figure 4: Structure of households according to essential equipment availability in rural areas (%)

Sources: (HCPM, 2023; MNTP, 2019)

The graph shows that the electricity availability for households in rural areas has significantly increased in the last decades, from 9.7% in 1994 to 85.3% in the last census of 2014. In terms of latrine (WC) availability, it has improved considerably from 32.6% in 1994 to 83.7% in 2014. In addition, households in rural areas had always possessed available kitchens as essential equipment for their daily life. However, the availability of baths, showers, and public baths in rural areas is rather limited. Additionally, water availability for households in rural areas is still low, reaching 38.3% in the last census.

The Moroccan Nomads:

The nomadic population constitutes a small minority in Morocco. It is characterized by the practice of animal husbandry and frequent movements motivated by the search for grazing areas and water points. The number of nomads on 1 September 2014 was 25,274 compared to 68,540 in 2004, representing a 63% decrease. 95% of the nomadic population is concentrated in four regions, all in the east and south of the country. Some of these regions are considered the least developed part of the nation. In terms of households, the number of nomadic households stood at 4044. The family structure of this population is still dominated by large households, which corresponds to an average size of 6.2 compared to 4.6 at the national level. Approximately 68.2% of nomadic households composed of five or more persons (32.8% are consist of at least eight people), 10.6% are composed of four individuals, 8.1% consist of three persons, 7.1% of

two persons, and only 6.1% was made up of one individual. However, the average fertility rate per nomadic woman decreased from 4.3 in 2004 to 4 in 2014. Despite this slight decline, this index was almost double the observed nationwide (2.2 children per woman) in 2014. The nomadic population is predominantly young. 36.0% of the population is under the age of 15 compared to 28% of the total population in Morocco. About 47.5% are under 20, and 65.5% are under 30. Nomads are more active than the entire population. Their employment rate reached 56.8% as opposed to 47.6% at the national level. In terms of unemployment, nomads are less exposed than the general population. Their unemployment rate stood at 10.1% (16.2% at the national level), 8.6% for men (12.4% nationwide), and 16.7% for women (29.6% nationally) in 2014. This difference could be explained by the fact that most nomads work and inherit the traditional jobs of their families. Illiteracy among the nomadic population is relatively high. Its illiteracy rate stood at 81.9% compared to 32.2% nationally. 89.5% of nomadic women are illiterate compared to 74.9% of nomadic men. Similarly, the educational level of the nomadic population remains very low. 84% of nomads have no level of education, 2.2% have attended preschool at most, 9.3% elementary school, 2.7% junior high schools, high school and higher education were only 1.2% and 0.6% respectively in 2014. Access to education among nomadic children is still minimal. The enrolment rate for children aged 7 to 12 is 31.3% (94.5% nationally), 39.8% among nomads boys, but only 23.5% among nomads girls (HCPM, 2016, 2023).

Environmental and political dimensions

Sustainable rural development faces many challenges in Morocco. The review discussed in the following subchapter the political and environmental aspects related to sustainability in rural areas, mainly via exploring the methods of wastewater disposal and investigating the practices of household waste disposal in Morocco. The paper relied on the latest available data from the conducted censuses from 2004 and 2014. Lastly, the review also discussed the incentives and factors that could foster the transition to sustainable rural development.

Methods of wastewater disposal	2004			2014		
	Urban	Rural	Total	Urban	Rural	Total
Public sewage system	79%	1.8%	48.6%	88.2%	2.8%	59%
Septic Tank	11%	36.5%	21%	9.6%	49.2%	23.2%
Drywell	3.1%	18.9%	9.3%	1.3%	21.3%	8.2%
In nature	6.9%	42.8%	21.1%	0.6%	25.7%	9.2%
Others				0.3%	1%	0.4%

Table 3: Distribution of households according to wastewater disposal methods in Morocco (%)

Source :(HCPM, 2023; MNTP, 2019)

The table demonstrates the disparity between rural and urban areas regarding the different wastewater disposal methods. Urban areas mostly use public sewage systems for wastewater disposal (from 79% in 2004 to 88.2% in the last census) compared to rural areas which could be explained by the limited access to this method. In terms of the adoption of the septic tank method, it is increasingly popular in rural areas (from 36.5% in 2004 to 49.2% in 2014). The use of dry wells is slightly increasing in rural areas (from 18.9% to 21.3%). Concerning wastewater disposal in nature, it was decreasing rapidly in urban areas from 6.9% in 2004 to 0.6% in 2014. However, although wastewater disposal in rural areas has also dropped from 42.8% to 25.7% in 2014, more is needed to protect and sustain the environmental aspect in rural areas.

	2016	2017	2018	2019	2020	2021	2022
The normal capacity of dams (Mm3)	15,212.2	15,212.2	15,137.3	15,597.0	15,597.2	16,122.6	16,122.6
Dams reserve (Mm3)	7,705.0	5,342.4	9,499.9	7,272.1	5,666.2	5,555.2	4,121.7
Filling rate (%)	50.65%	35.12%	62.76%	46.62%	36.33%	34.46%	25.56%

Table 4. Morocco's main dams filling rate as of December 14 (2016-2022)

Source: (MEWM, 2023)

The wise use of water in the Moroccan context is quite relevant. As agriculture relies heavily on natural resources and is increasingly subject to water risks. The strong decline in rainfall experienced since 1980 in Morocco (-15% to -20%) with a decrease in river runoff (-30% to -40%) is

putting increased pressure on agriculture (Hadria et al., 2019; WBG, 2017). In addition, the experienced rain deficits since 2015 are affecting water resource availability in the country with dwindling groundwater reserves (Luo et al., 2015; WBG, 2017). The groundwater is extracted well beyond the level of sustainable abstraction. In this regard, the WRI has categorized Morocco as a country with high water stress in 2010 and extremely high water stress in 2040 (Luo et al., 2015). The impact has already been perceived, since over the last seven years the main dams filling rate have substantially decreased. This requires urgent action to address this issue, not only in the main relatively industrial cities but also in rural areas by raising the awareness of the rural population regarding this finite resource and fostering the adoption of sustainable practices to adapt to the current water shortages facing the country during the last and current decade. However, since 70% of farms are smallholders and are usually unable to implement new sustainable practices and technologies as a result of the high illiteracy rate, this further increases the vulnerability and marginalization of rural communities. Subsequently, affects the progress of rural development plans and the sustainability of the rural communities.

Disposal of household waste methods	Urban	Rural	Total
Common waste bins	67.7%	2.7%	45.5%
Common or private garbage truck	26.9%	5.9%	19.7%
In nature	4.8%	89.3%	33.6%
Others	0.6%	2.1%	1.2%

Table 5: Distribution of households according to waste disposal methods in Morocco (2014) (%)

Source :(HCPM, 2023; MNTP, 2019)

In terms of waste disposal methods used in the rural areas of the country, it is mainly disposed of in nature (about 89.3%) based on the latest available data from the government census, and only about 10 percent are disposed of through appropriate methods via common waste bins and common or private garbage truck facilities, which constitutes from a sustainability perspective one of the issues facing its environmental dimension. Based on the mentioned figures, we can also deduce that rural infrastructure is still a work in progress in order to support and foster sustainable rural development in future plans and increase the resiliency of rural communities.

Politically, the government focuses more on the economic dimension of rural development, specifically on agricultural development, than on the other dimensions of equal importance from the sustainability aspect. However, it reduced poverty in rural areas for a better standard of living, created job opportunities, supported rural youth entrepreneurship, and even slowly reduced the severity of the rural exodus that Morocco experienced in the last fifty years after its independence.

Despite the country's progress, there is still no clear integrative sustainable rural development model that applies to its specificities. Although the second component of the National Strategy for Development of Rural Space and Montagne Zones (NSDRSMZ) via the government's declaration of January 2012 concerns integrated and territorialized projects of an economic and environmental nature. The national strategy was essentially focused on the physical and social infrastructure of rural development, boosting agricultural development for economic purposes and reducing disparities via the Programme for the Reduction of Territorial and Social Disparities (PRTSD), which was launched in 2015 for the period 2017 – 2023, ignoring the environmental dimension that constitutes one of the basic pillars of sustainability in rural development (HCPM, 2023).

Certainly, at the national level, the government has made significant efforts to protect the environment, such as through the framework law on the National Charter of the Environment and Sustainable Development, which was based on the royal guidelines of July 30, 2011, and the implementation of the Environment Upgrade Strategy (EUS). The country also held the 7th rank in the Climate Change Performance Index (2023) and was ranked 70th with a score of 70.9, better compared to the previous year in the 2023 Sustainable Development Goals (SDGs) index assessing the progress towards achieving all 17 SDGs. In addition, Morocco participated in and hosted many international events and conferences relating to environmental protection and sustainability issues such as COP 7 on October 29, 2001, and COP 22 on November 7, 2016, at Marrakesh. Furthermore, the country is engaged and presented the voluntary national review on the implementation of the Sustainable Development Goals (SDG) in 2016 and 2020 provided to the United Nations Economic and Social Council. Nonetheless, in rural areas, most of the focus is still on improving the economic and social aspects, which is understandable from a developing country's position (Burck et al., 2022; HCPM, 2020, 2023; Sachs et al., 2023).

Despite the fact that rural development in the country is still a work in progress in order to be recognized as a sustainable one. Based on Morocco's commitment to climate change mitigation and adaptation through subscribing to the implementation of the Sustainable Development Goals Agenda 2030. It is likely that sustainable rural development will be considered and embodied in future strategies and development plans.

Discussion

The study provides insight into the past and current rural development and the challenges facing the rural population in Morocco from a sustainability lens. Morocco, as one of the major economies in the African continent, is considered to be at the crossroads of development whether to follow the traditional development path, which is often notorious for disregarding sustainability issues and resource depletion, such as what occurred in the industrial revolution periods or to benefit from the experience of other developed countries and forge a new path of development based on the fundamental concept of sustainability, taking into account all the dimensions required for a society to prosper and be suitable to the country's specificity.

Economically, rural areas have benefited from agriculture development plans implemented by the government in the last decades, which is considered to be the backbone of the economy in the country (Elalaoui et al., 2021). In addition, the government also improved the accessibility to rural roads, public water systems, and the electrification rate in rural areas. However, more effort remains to be implemented in order to keep promoting sustainable practices and fostering the adaptation of the sector regarding the current and future projected climate change scenarios. Rural areas are still facing several issues, such as the condition of rural houses, which in many cases do not meet the minimum safety standard requirements, the low drainage lines accessibility rate, and the gender disparity of rural women perceived in the rural labor market, as most women occupy low-wage job positions, in some cases informal ones, which can be attributed to the high illiteracy rate among rural women. The high illiteracy rate also affects rural development and hinders the implementation of new sustainable practices in the agricultural sector.

Socially, illiteracy in rural areas is still rampant, notably among Moroccan nomads. However, during the last years, the enrollment rate of the

rural population at school has significantly increased. Rural poverty has also decreased substantially, largely thanks to the agricultural development plans in the last decade. In addition to the significant improvement in terms of health coverage rate due to various programs that the rural population benefited from. The structure of households according to essential equipment availability in rural areas has undergone notable improvement over the past few decades.

On the environmental front, the government still needs to focus on providing infrastructure and raising awareness about environmental protection, as 89.3% of waste disposal and 25.7% of wastewater disposal are still dumped in nature. This will further exacerbate the water scarcity caused by the substantial decrease in water availability facing the country in recent years. However, it should be mentioned that the task is considered rather challenging due to the high illiteracy rate in rural areas.

Politically, Morocco, since its independence, has implemented various projects and governmental programs focused on stimulating the development of rural communities, often with the help of foreign aid such as the *Programme d'habitat rural* (1967–1972) of UN (United Nations) involved FAO, and The 2020 Strategy for Rural Development in cooperation with UNDP (United Nations Development Programme), FAO, and the World Bank Group in collaboration with Moroccan institutions, mainly the Ministry of Agriculture, Rural Development and Maritime Fisheries (FAO, 2006; Tenzon & Fisher, 2022). As the focus of national policies has shifted to rural development outcomes, decisively pro-poor, and development plans that include participatory approaches for intervention. The country has emerged as a suitable partner for international donors, and the empowered rural communities will facilitate the transition into a sustainable development model (Ben-Meir, 2019; Doherty, 2017). However, Rural areas in Morocco still face multiple challenges from different dimensions. One way to diversify female employment is to support further the associations that target this population in order to extend their impacts, where women can learn and improve valuable skills such as traditional crafts in the same time offering educational opportunities which will support addressing gaps in access to education, improved employment opportunities, and financial support possibilities for cooperatives and entrepreneurship as a step toward rural women's integration in development (Ennaji, 2008; Tribak & Rguig, 2021). For developing countries, such as Morocco, it would be crucial to improve agricultural and rural

development governance, to encourage communication development between the national, local, regional, and international actors both vertically and horizontally as well as fostering the participation of civil society organizations as a way to boost policy impacts and contribute to potential sustainable development in rural areas as well as adopting the latest sustainable development models, solutions, and practices to increase the adaptive capacity of the society as a whole (El Bilali et al., 2012).

Conclusions

The paper concluded that based on the previous and current Moroccan development trends. The government is well aware of the importance of the sustainability aspect, and it will likely be emphasized in future rural development plans. Sustainable rural development in Morocco will improve the quality of life of the rural population especially the marginalized ones by developing capacities that promote community participation, food security, health and education, sustainable economic prosperity, and environmental protection. Thus, enabling the rural population to achieve their potential and preventing depopulation of regions affected by rural exodus. Additionally, a successful transition to sustainable rural development in one North African country will foster the consideration of other neighboring countries for a sustainable development path. However, the current infrastructure of the rural areas in Morocco is not sufficient yet to support this transition.

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