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Investigation on Human Development Needs, Challenges, and Drivers for Transition to Sustainable Development: The Case of Qatar

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Abstract: Human development has been widely accepted as both the primary goal and driver of sustainable development. Human development is critically important for countries attempting a radical transformation from a resource-based economy to knowledge-based, sustainable development, like Qatar. This paper examines Qatar's human development needs and challenges with respect to its economic, demographic, and educational development goals. Following a comprehensive literature review, domain-specific documentary information and data were collected and analyzed, along with qualitative insights and data obtained through semi-structured interviews with local professionals from various sectors, to gather opinions about the needs, challenges, drivers, and recommendations for human development. A preliminary integrated policy framework and set of recommendations for human development planning are proposed as a guide, for Qatar and similar countries, for transitioning from a resource-based economy to knowledge-based sustainable development. This framework and the understanding of the needs, challenges, and drivers based on the qualitative research, in conjunction and in comparison with the literature analysis, are expected to assist decision-makers in devising, and more importantly implementing, tailored policies and roadmaps focused on four key dimensions: skills (education), citizenship, leadership, and health.

Keywords: sustainable development; human development; human capital; human capacity; Qatar; resource-based economy; knowledge economy

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1. Introduction

Human development (HD) has been recognized as the ultimate goal and main driver of sustainable development, which strives for delicately balanced economic, social, and environmental outcomes [1]. This recognition, however, is not without challenges and resistance. For decades, labor has been misrepresented as the sole factor of production in economic growth, relegating social and environmental development to the background [2]. Increasing emphasis on knowledge-based discourses for solving sustainability challenges has required countries to reconsider and rejuvenate their development frameworks [3]. This includes many countries that rely on natural resources but aim to achieve sustainability.

Although the hydrocarbon sector continues to drive economic prosperity in the Gulf Cooperation Council (GCC), questions concerning the sustainability of resource-reliant models have arisen due to systemic shocks, resource depletion, and changing demographics and consumer habits [4]. The policy challenge of how Gulf countries can achieve sustainable development and move away from dependence on extractive industries represents a topic of rigorous scholarly debate over the past decades [5]. It has long been postulated that

using the resource advantage significantly boosts countries' fiscal revenues and economic growth [6]. However, these models have been increasingly challenged, as GCC member states do not effectively use resource revenues to follow a path of sustainable growth [4]. Furthermore, overreliance on natural resources to drive economic growth produces negative externalities such as weak institutional and legal frameworks and underdeveloped non-extractive industries [7,8] confirms this, demonstrating that natural resources crowd out human capital and decelerate economic development. With the rest of the world increasingly embracing new technologies as a source of long-term growth, it is evident that the path of the Gulf States to sustainable development and diversification requires a refocus from the hydrocarbon-led economic model to those areas considered strategic in the development of a knowledge-based economy.

The challenges facing a transition to sustainability have also been acknowledged by the state of Qatar, which recently laid out grand policy strategies under the umbrella of the Qatar National Vision 2030 (QNV2030) [9]. With its emphasis on a knowledge-based transition, QNV2030 involves reconciling conflicting policy priorities to achieve sustainable development. It furthermore addresses the population imbalance between local citizens and expatriates, and the country's aspirations to maintain its current per capita GDP in the coming decades. The Qatari human development plan aims to prepare its citizens for knowledge-intensive industries and ensure the steady replacement of low-skilled expatriate workers with well-trained foreigners [10].

Qatar's challenge in transitioning to a knowledge-based economy merits further research, as a failure to move from a resource-based to a knowledge-based economy will inevitably yield long-term ramifications for the country's development. Countries, particularly those suffering a knowledge deficit, have much to gain from moving to the "knowledge society" as returns on knowledge acquisition increase [11]. According to [12], government effectiveness, education spending, and academic publications positively influence economic development. Moreover, education represents a powerful tool against fraudulent reporting [13] and corruption [14]. Creating a productive society is closely linked with knowledge acquisition and economic demand. The relationship between higher-value-added activities and knowledge-intensive activities is increasingly prominent. Besides comprising the foundation of competitiveness worldwide, these activities will eventually generate the wealth of the future; hence, they are crucial for the development of countries in transition. The state plays a vital role, primarily through research and education, which are areas that do not result in immediate profits but are ultimately essential to any knowledge acquisition system [15]. Ultimately, how dynamically a society participates in knowledge acquisition and how effectively it contributes to human development depend on its social, cultural, economic, and political structures.

Qatar aspires to transform itself into a sustainable knowledge economy in the coming decades and gradually move away from its heavy dependence on oil and gas resources [16]. Thus, understanding the status and recent trajectory of the country's demographics, economic structure, and workforce composition is critical in determining if this vision is achievable. This is particularly true given that sustainable development can be realized only with tailored strategies and adequate preparation of human development [17,18]. Thus, the question underlying this study is how to formulate policies for educated, talented, and forward-looking human development that will identify a trajectory toward sustainable development based on an innovation-driven knowledge economy.

Some scholars have been more inclined to examine opportunities for human development in light of the 2022 World Cup, which Qatar will host [19]. Although such scholarly efforts are needed to assess and appraise Qatar's short-term development plans, it should be recognized that mega-events rarely bring sustainable economic growth to host countries [20]. Sustainable job creation was a major selling point in attracting previous similar mega-events, but expectations surrounding these have rarely been satisfied [21,22].

Other research compares management of human resources within the Gulf by exploring how different GCC states have addressed their policy challenges [4,21]. Still, such

investigations lack the in-depth assessment of individual countries' responses and seem to generalize policy prescriptions that assume homogeneity across the Gulf States. Similarly, *Qatarization* and its impact on the Qatari labor market have also been studied [22,23] (*Qatarization* is a focus of QNV2030 and aims to increase the number of Qatari citizens employed in both the private and public sectors). Yet, these investigations have focused on the systemic challenges created by policy without recognizing that the path toward a sustainable knowledge economy requires a complete transformation of the Qatari education system.

The transition from a resource-based economy to a knowledge-based economy is of contemporary relevance and merits an in-depth, country-specific inquiry [24,25]. This study aims to develop a comprehensive framework to examine and assess the human development strategies of Qatar by exploring the measures introduced in various areas (including education, the labor market, and *Qatarization*). It furthermore takes the systemic social and economic challenges that the country faces into context. To achieve this, two research questions (RQs) are explored:

Research Question 1 (RQ1). *Which gaps, trends, and needs exist in Qatar's human capacity to contribute to the goals of QNV2030, considering Qatar's economic diversification and sustainable development options?*

Research Question 2 (RQ2). *Which progressive and adaptive policies, strategies, and roadmaps are needed to contribute to the goals of QNV2030, considering the national, regional, and international environment, trends, and challenges?*

The rest of this paper is organized as follows. Section 2 discusses Qatar's case in detail, including a comparative analysis of Qatar's education, demographics, and human development against benchmarked countries. This section is built on secondary data and intends to answer RQ1 of this study. Section 3 describes the methodology of the interview process, along with sample selection. Section 4 presents findings of the qualitative study and attempts to answer both RQ1 and RQ2. Section 5 presents a synthesis of overall findings from the literature review and qualitative research. Section 6 integrates secondary data analysis with stakeholder feedback to develop a framework for Qatar's human development strategy, thus completing the analysis of RQ2. Finally, Section 7 summarizes the research outcomes and provides a critical reflection on the limitations of this study as well as possible avenues for future research.

2. Literature Review

2.1. Status of Human Development in Qatar

Perspectives on the place and characteristics of humans as a component of the economic system have considerably changed in the transition from resource-led growth models to knowledge-based economies and sustainable development. During the 19th and 20th centuries, humans were considered alongside other capitals of land and labor as a production factor for economic growth [26]. However, with the automation and technological revolution, as well as the changing approach of capitalism in the 20th century, the perceived role of the human has evolved to include contributing capacity for enabling economic development [27]. Later, at the beginning of the 21st century, the innovation-driven, knowledge-based sustainable development paradigm and a heightened focus on society and environment [28] led to recognition of humans as enablers and building blocks of sustainable development [27] (see Figure 1).

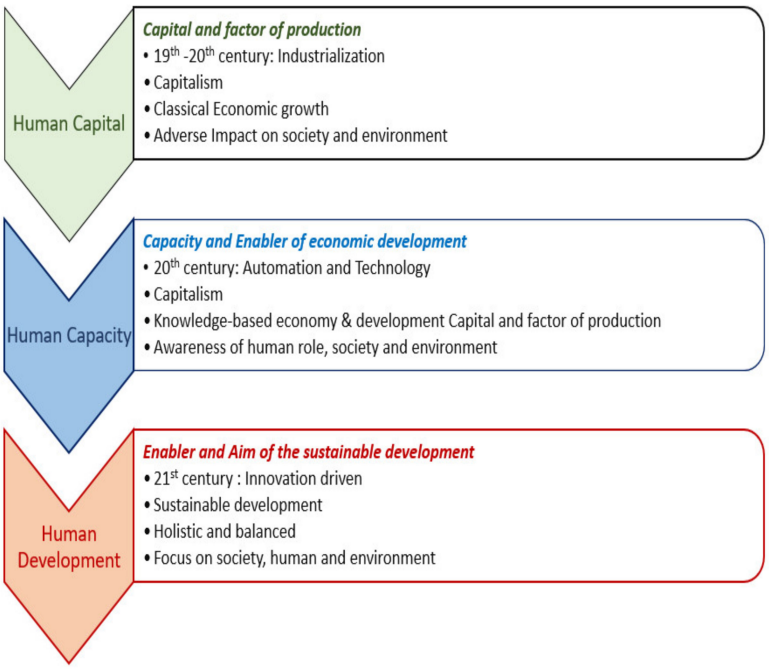

Figure 1. Human capital theory [27].

Human development is a multi-dimensional process that combines various forms of social, economic, and political progress to enable innovation and the development of human potential [1]. As a result of human development, this enhancement in human potential is a necessary requirement for a country's transition to a knowledge-based economy and thus sustainable development. Knowledge economies require research-based innovation and development on which to capitalize [29]. These are intangible assets that a country can produce via dedicated focus on particular areas, such as education and workforce development. It is also important to work on demographics to make them more sustainable and the country's workforce more efficient. Therefore, to transition to a knowledge economy, countries must channel their economic preferences, with the overall purpose of building human potential. Based on secondary data, this section attempts to answer RQ1 by examining Qatar's current economic, demographic, and educational trends. We furthermore compare Qatar's performance against benchmarked countries using the Education pillar of the Human Development Index (HDI) and the Human Capital and Research sub-index of the Global Innovation Index.

2.1.1. Qatar's Economic Trends

Qatar is one of the wealthiest countries in the world, but its economy is criticized for its high dependency on oil, gas, and the derivatives of these. Qatar 2030′s vision is to build a society that promotes equality, justice, and goodwill [30]. Four fundamental developmental pillars (human, social, economic, and environmental) are identified in the policy [30,31]. Some elements of this system are already integrated into current policies, some are under construction, and others are yet to be implemented.

Qatar has experienced fast-paced economic development in recent decades owing to oil and natural gas revenues. Natural gas production has increased sharply, from 2.2 million tons per year in 1997 to 92 million tons in 2013, making Qatar the world's largest exporter of liquefied natural gas (LNG) [32]. A third of global LNG trade can be attributed to Qatari exports, and 80% of Qatar's exports are oil and gas products [33]. Qatar's economic and financial policies have thus been driven by factors connected to hydrocarbon production and export. However, Qatar has also made significant strides in diversifying its economy, investing in non-oil sectors. Qatar aims to transform into a knowledge-based economy and society, reducing the contribution of oil and gas to its

economy. Investments in the financial sector at both national and international levels have started to yield dividends, increasing Qatar's diversification compared to its neighbors [34]. Despite this, diversification initiatives have yet to show their actual, long-term impacts on Qatar's overall economic outlook. As mentioned, the economy still relies heavily on natural resources, followed by the services and manufacturing sectors. These sectors have experienced further growth thanks to Qatar's hosting of the 2022 FIFA World Cup, and sectors like construction and services have also started to grow. As current projects conclude, the question becomes which sectors, other than oil and gas, Qatar should focus on to become a sustainable knowledge economy [35].

This study will thus assess Qatar's hydrocarbon and construction sectors as the dominant contributors to GDP and the subsequent impact on a sustainable development vision.

2.1.2. Demographic Trends

Qatar's population has increased drastically in recent years, especially since 2010, primarily because of the influx of low-skilled workers for construction projects related to the FIFA World Cup. Additionally, the gender distribution has shifted toward a male majority since 2010, as the numerous construction and industrial projects have attracted almost exclusively male immigrants. Since 2010, there has been a surge in the population of 25 to 35-year-old males, yielding a significantly high ratio of men to women—the highest in the world. Once World Cup construction projects are completed, assisting Qatar's change to a knowledge economy and carefully managing the *Qatarization* process will require that immigration policies are changed to attract highly-skilled ex-pats. Regarding the general population, Qatar is a country with a small proportion of native citizens embedded in a larger expatriate population. Data from the official Planning and Statistics Authority (PSA) show approximately 333,000 Qatari nationals living in Qatar as of early 2019, meaning that Qatari nationals accounted for only 11.7% of the population in mid-2019 [36]. As the number of migrants in Qatar continues to grow, the local population becomes an even smaller minority, with natural population growth unable to keep up with the growing number of expatriates pouring into the country.

A knowledge-based society efficiently produces, diffuses, and uses a wide range of knowledge. Thus, a well-educated and skilled population is required to transition to a knowledge society, as shown in multiple reports from the World Bank and the Organization for Economic Co-operation and Development detailing both successful and futile transformations [37]. To expand its skilled workforce, Qatar must attract skilled migrants. One way to do this is by focusing on international students in essential fields. Encouraging the mobility of international students is beneficial for both home and host societies, as student migration can positively influence economic growth for both sending and receiving countries [38]. However, migrants themselves must reap most of the gains through higher earnings for the process to succeed.

Qatar must also pay close attention to developing tailored policies to overcome the shortcomings presented by the skilled, well-educated population required for the transition to a knowledge economy, which fall under the assessment of this study.

2.1.3. Qatar's Education System

Any country wishing to transform into a knowledge economy must establish the six fundamental pillars: leadership, human capital, innovative capabilities, IT infrastructure, financial resources, and innovative climate [39]. As depicted in Figure 2, the native Qatari population is reasonably well-educated, with most males educated up to the secondary level, though Qatari females have a greater inclination to pursue higher education. Conversely, Qatar's expatriates have less robust education portfolios, with most men educated only at the primary level. The main reason for this less-educated, male-dominated non-Qatari population is that men are typically involved with hard-labor jobs in Qatar's large infrastructure enhancement projects. When Qatar's investments in the World Cup end, a large percentage of these non-Qatari laborers, who have only contractual appointments are

expected to return to their native countries, affecting the demographics of Qatar and the education spectrum.

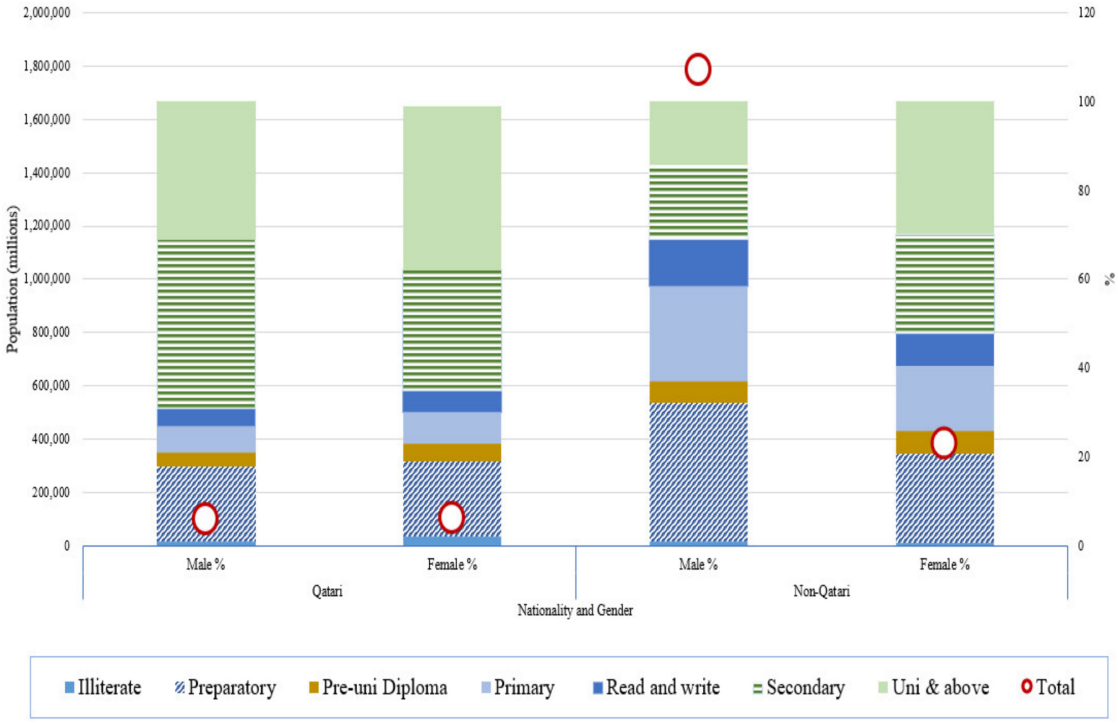

Figure 2. Population distribution by nationality and education level. Source: adapted from [40]; total refers to population (left *Y*-axis).

More investment and focus have been placed on Qatar's education field, and since 2002, comprehensive institutional reforms have aimed to strengthen the education and schooling system [41], a process that began with the reform of the K-12 education system. In 2003, the Supreme Education Council (SEC) was established to oversee the deployment of subjects/fields offered in the independent school system and develop the accountability of the system. In 2016, the SEC was reformed into the Ministry of Education & Higher Education [42]. By 2011, a bilingual Arabic/English system had replaced the solely English teaching system for mathematics and science [42]. Under the umbrella of the Qatar Foundation (QF), the country has invested in numerous education, research, development, and innovation initiatives to support the knowledge economy by attracting international branch campuses to Education City and instituting the Qatar National Research Fund (QNRF), the Hamad Bin Khalifa University (HBKU), Research Institutes (QEERI, QBRI, QCRI), the Qatar Science and Technology Park (QSTP), and Qatar Academy schools. Since 2000, Qatar has made remarkable investments in the education and health sectors. The number of schools, classrooms, IT infrastructure, et cetera, increased alongside the population because of economic growth, which was fueled mainly by natural gas revenues. The numbers of students and teachers have also increased significantly, and there is a greater variety of school/curriculum types thanks to liberal policies implemented to accommodate the wide variety of expatriates arriving. However, despite the variety of schools and universities, the question is whether the education imparted in the fields preferred by the population is conducive to building a knowledge economy.

Expenditures assigned for education comprise another indicator of Qatar's educational progress. Following QNV2030, the Qatari leadership has assigned a larger share of GDP to education. The government has invested massively in infrastructure enhancements to improve the quality and quantity of educational institutions at the primary, secondary, and tertiary levels. In addition to education expenditure, student–teacher ratio represents another critical aspect of developing a knowledge economy [43]. Current figures are very

encouraging; the average number of students per teacher is 15 at the pre-primary level and drops to 9 at the secondary level, increasing the quality and duration of student–teacher engagement.

The Qatari enrollment rate has been stable while the non-Qatari enrollment rate has increased, commensurate with the increase in population. However, the enrollment of the Qatari population in tertiary education has been increasing, while non-Qatari enrollment has been stable. This means that tertiary enrollment figures do not follow the trend observed in secondary enrollment rates, suggesting that non-Qataris prefer attending international universities outside of Qatar, which raises the question of how Qatar can attract and retain human capital. Another feature is the higher enrollment rate of Qatari women in tertiary education than men, as shown in Figure 3. One reason for this is the cultural constraint on women, which restricts them from gaining international experience, yet there are more Qatari women in tertiary education in international universities in Qatar than Qatari men. Another reason is that Qatari men may lack an incentive for higher education, as they are offered lucrative positions in the public sector after graduating from high school [44].

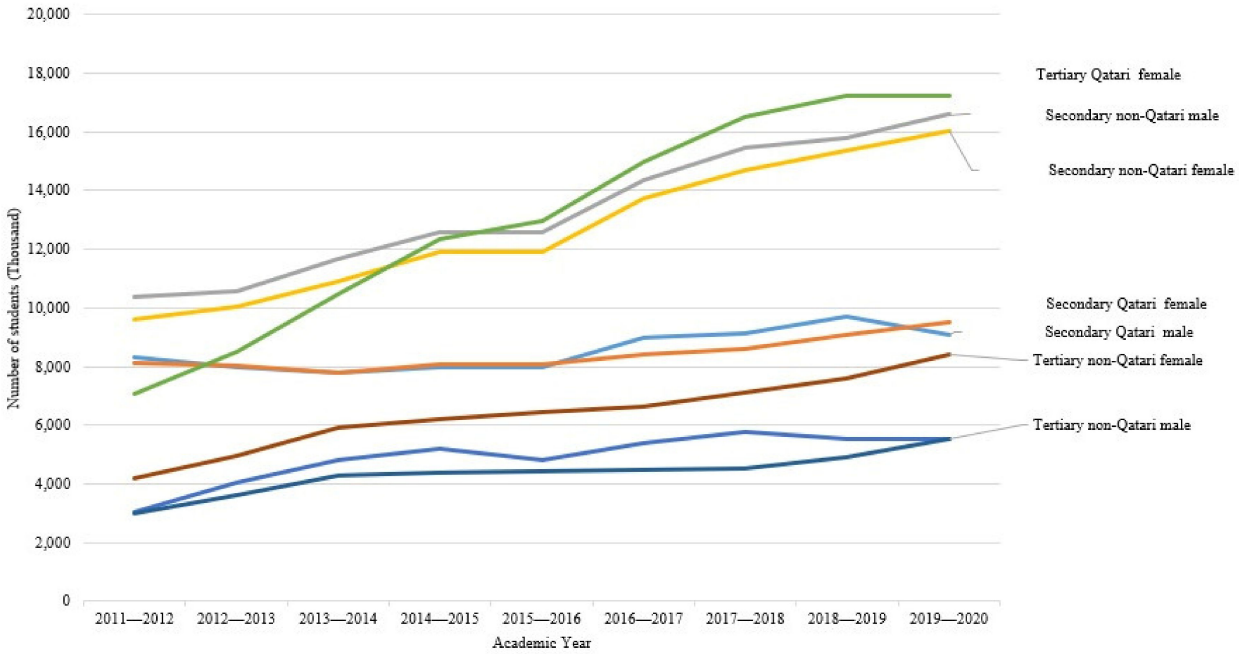

Figure 3. Gross secondary and tertiary enrollment rates in Qatar (2011–2019), adapted from [45].

In light of the observations above, it is important to note that some majors pair particularly well with STEM (science, technology, engineering, and mathematics) areas. However, the fields chosen by Qatari students do not necessarily align with these majors. This observation contradicts both knowledge economy requirements and the aims of *Qatarization* policies. Figure 4 shows the number of graduates from various disciplines for both the Qatari and non-Qatari segments of the population between 2013 and 2019.

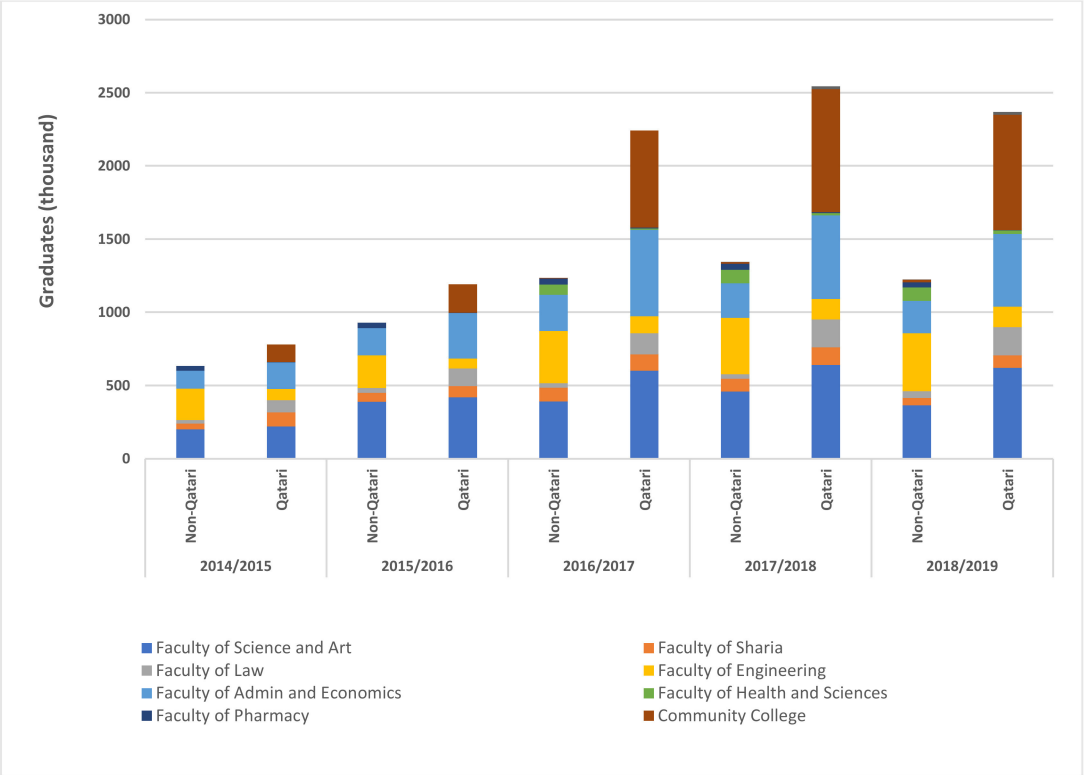

Figure 4. Graduates of public colleges and universities based on specialization and nationality, adapted from [40].

The Qatari education system has been subject to significant modifications and improvements over the past decade. However, benchmark indicators still show that academic achievements of Qatari students are behind those of their counterparts in the developed world [42]. According to research commissioned by PISA (Program for International Student Assessment) [46], examination results showed that Qatar ranked 61st out of 65 studied countries regarding quality of education. Only students from Panama, Peru, and Kirgizstan scored lower than those from Qatar [47]. The education chasm between the performance of Qatari students and students from more advanced knowledge-based economies is readily apparent [48]. Test results further showed that Qatar's average score in reading literacy was 407 points, while the average across Organisation for Economic Co-operation and Development (OECD) countries was 487 points [37]. The same trend is observed in mathematics, with a shortfall of 70 points compared to other countries' scores [37]. A more telling indicator is the number of students scoring below proficiency thresholds. Nearly 50% of Qatari students appeared to have only basic proficiency in reading, a score equivalent to that of Saudi Arabia, and the number of students with only a basic reading level was nearly five times higher than that of the knowledge-based economies of Finland, Singapore, and China [34].

Some have argued that these discrepancies are a consequence of long-standing reforms to education [41,48,49], yet, it is noteworthy that Qatar underperforms in educational outcomes. Despite improvements in the education sector, PISA test results suggest that substantial transformation in the education sphere is necessary for the country to become a knowledge-based economy.

Such results further suggest that Qatar's economic and educational reforms have not produced the desired level of change. There is a need for systemic improvements in the education sector to ensure that best practices for developing human potential are employed and that the country's education sector can learn from the experiences of other countries [50].

2.2. Comparative Analysis of Qatar and Benchmark Countries

Different countries design and follow different strategies for transforming to knowledge-based sustainable development. In this section, Qatar is compared against a group of benchmark countries using the Human Development Index (HDI) [51] and Global Innovation Index (GII) [52]. The HDI index is measured through three basic dimensions, including long healthy life (health), access to knowledge (education), and decent standard of living (employment). The GII index has two sub-indexes: innovation input and innovation output. Innovation input incorporates the scores for all enablers: (1) institutions, (2) human capital and research, (3) infrastructure, (4) market sophistication, and (5) business sophistication. The scores for (6) knowledge and technology outputs and (7) creative outputs are combined in the innovation outputs' sub-index. This study focuses only on the access to knowledge (education) sub-index of HDI since education is considered to be the most transformative tool for sustainable development [51]. The same reasoning holds for the human capital and research sub-index of GII. Therefore, we use the Education component of HDI and Human Capital and Research sub-index of GII as each other's complements. The study in [52] proposes a tight connection between sustainable development and quality of education, since education necessitates adequate conceptualization, given the importance of education and human development in creating sustainable, long-run development; education further ensures proper implementation of policies proper implementation of policies and recommendations for measurable changes, as well as the tools needed to monitor and evaluate this change.

The five countries selected for comparative analysis were Norway, Singapore, South Korea, Bahrain, and the United Arab Emirates (UAE). South Korea, Norway, and Singapore were selected as benchmark countries on the grounds of their similarities to and differences with Qatar. South Korea presents a good example of a country that has undergone a successful transformation from an agriculture-based economy to a knowledge-based economy thanks to its strategic, progressive planning and its leadership, which has been wise, dynamic, and long-term [53]. Furthermore, the careful implementation of strategies supported by continuous monitoring and assessment is a prerequisite for South Korea's successful shift to a knowledge-based economy. Qatar has adopted a similar long-term strategic approach, as evidenced by the introduction of QNV2030. Like Qatar aims to do, Norway transformed from an oil-centered economy to a knowledge economy. Norway offers an example of transformation based on participative decision-making and a well-coordinated strategy between economic and education/workforce development, from which researchers and practitioners can learn [54]. Norway's successful immigration policy is another point Qatar should consider in shifting from its prevailing low-skilled worker structure to policies attracting more skilled and semi-skilled workers [55].

Singapore is of similar size and demographics to Qatar, with a relatively small population and land that is limited but holds strategic geography. Singapore is also known for its diversified population and openness for selective naturalization and immigration, as well as long-term leadership guiding its transition to a knowledge-based economy [56]. Singapore's experience additionally indicates that improving education quality, which creates an innovation-driven environment, and attracting skilled labor are essential in creating more sustainable economic growth [49]. Bahrain and the UAE were selected due to similar populations and richness in natural resources, as well as geographical and cultural proximity. Their national visions are, furthermore, similar to QNV 2030, with a knowledge-driven aspiration.

In 2020, Qatar ranked 45th out of 189 countries based on its HDI of 0.848, up from 0.750 in 1990 [57]. Qatar ranks reasonably well overall but still lags behind benchmarking countries. Since education is the primary focus of this study, we conducted further investigation of the HDI sub-index concerning education. In determining Education Index, two dimensions are considered: (1) mean years of schooling and (2) expected years of schooling. Table 1 shows that Qatar performs poorly in terms of education or knowledge output. Thus, greater emphasis must be placed on education, an identified gap highlighted in this study.

Table 1. Qatar compared to benchmark countries via Human Development Index (HDI) and Education Index 2020 [57–60].

Country	Rank & (HDI Value)	Education Index	Expected Years of Schooling	Mean Years of Schooling
Norway	1 (0.957)	0.93	18.1	12.9
Singapore	11 (0.938)	0.844	16.4	11.6
South Korea	23 (0.916)	0.865	16.5	12.2
United Arab Emirates	31 (0.98)	0.802	14.3	12.1
Bahrain	42 (0.852)	0.769	16.3	9.5
Qatar	45 (0.848)	0.659	12	9.7

Table 1 shows that Qatar ranks at 45 with an HDI value of 0.848, which is the lowest of the six countries considered. Norway demonstrates the highest HDI value, 0.957. From the Education Index, Norway clearly outperforms the five other countries, including Qatar, which has the lowest Education Index, which then decreases overall HDI for Qatar. Hence, if Qatar improves its education (as measured via Education Index), a higher HDI value and ranking will result.

Similar results are obtained when comparing GII Human Capital and Research components between Qatar and the benchmark countries. From Table 2, we can observe that poor performance is attributed mainly to the subcategories of education and R&D. Qatar's performance in the education subcategory is explained by the small percentage of government expenditure to overall GDP. This ratio is, however, substantially influenced by oil price fluctuations. However, the weak results from the PISA test, which indicates quality of education, suggest that the government must make reforms to improve the quality of the education system. If such reforms are not enacted, supplying Qatari nationals for the local private labor market may remain challenging [61]. Qatar also does not perform well in R&D because of the limited number of researchers within the population—577.3 researchers per million inhabitants [62]. This underscores the importance of nurturing high-caliber universities in Qatar so that local talent can flourish to address domestic needs and serve as ambassadors for Qatar on global platforms [63].

Although Qatar has prioritized education, human capital development, and R&D as part of its QNV2030 since the 2000s, these findings from recent HDI and GII comparisons are alarming.

2.3. Identified Gaps

The literature review identified numerous gaps after studying three thematic areas (demographic trends, Qatar's education system, and economic trends). First, studies of demographic trends show the large influx of low-skilled workers as a key challenge that continues to affect the country's current demographic structure, which then affects its overall performance, efficiency, and sophistication in human development, education, and economy. This area of research is not complete, however, as a lack of understanding regarding the immigration policies necessary to develop a knowledge-based economy exists. Second, studies on economic development provide sufficient information regarding the economic effects of over-reliance on gas and oil. There is, however, a lack of clarity on the high-tech, knowledge-intensive, and green sectors in which the country must invest to establish a sustainable economy. Studies investigating the education system indicate that Qatar has made significant progress in education as a result of investments in infrastructure and numerous initiatives related to education, research, development, and innovation. The gap identified in these studies is that current practices do not align with the government's aspiration to achieve the sustainable development goals outlined in its QNV2030.

Table 2. Qatar compared to benchmark countries through GII human capital and research components (GII) [62].

Country	Ranking of Human Capital and Research (Index Value)	Ranking of Education	Ranking of Tertiary Education	Ranking of Research & Development (R&D)
Singapore	9	54	2	15
	(58.7)	(54.0)	(63.1)	(59.1)
South Korea	1	22	13	1
	(67.4)	(61.5)	(51.0)	(89.8)
Norway	13	3	42	19
	(56.8)	(75.3)	(39.7)	(55.5)
United Arab Emirates	22	61	3	28
	(49.9)	(52.0)	(59.2)	(38.6)
Bahrain	83	81	73	82
	(26.3)	(44.1)	(30.5)	(4.2)
Qatar	75	94	37	67
	(29.8)	(40.1)	(42.0)	(7.4)

The literature review in Section 2 attempts to clarify the gaps, trends, and needs for Qatar's sustainable development ambitions. The following sections will supplement the analysis thus far by exploring the experiences, views, and insights of interview participants. Furthermore, the qualitative study will shed light on what policies must contribute toward sustainable development.

3. Methodology

3.1. Design Thinking Approach

As shown in Figure 5, the design thinking approach involves five phases: discovery, interpretation, ideation, experimentation, and evolution [64]. In the discovery phase, a comparative examination of Qatar's demographic, economic, and human development trends and educational issues was achieved by performing a comprehensive and comparative literature review. Outcomes of the discovery phase comprised the introduction and literature review sections of this manuscript.

Second, during the interpretation phase, our team identified gaps and composed a problem statement for Qatar's hydrocarbon and construction sectors, as they represent the main economic contributors to GDP. This domination impacts human capital needs in terms of demographics and skills, alongside the weakness of the industry–university partnership in terms of education, training, and research. This phase demonstrates the serious and salient shortcomings that must be recognized and addressed with appropriate, effective, and long-term policies and recommendations, with contribution from all stakeholders.

Third, in the ideation phase, we conducted semi-structured interviews with stakeholders from various sectors, including government, private, and education sectors, for two main purposes: (1) to identify any further shortcomings, needs, and challenges that exist in Qatar's human capacity to contribute to the goals of QNV2030 and thus sustainable development, and (2) to propose a framework for progressive and adaptive policies needed to achieve the excellence in education, training, and research for meeting the needs of economic diversification and sustainable development. This phase thus yielded the methodology and results sections. All findings were then refined by analyzing them into themes and subthemes using thematic analysis, after which a set of initial recommendations was generated. Finally, we wrote discussions, recommendations, and conclusions of the study.

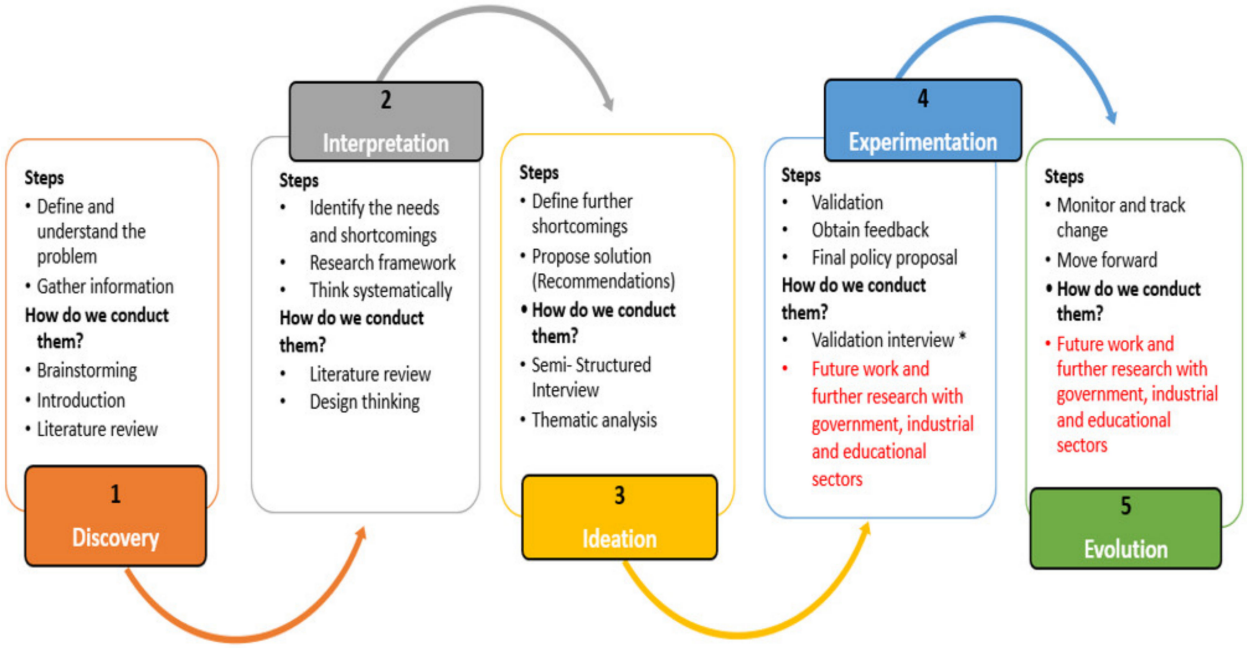

Figure 5. Design thinking process followed by this study. * Indicates that the associated section is written in the published paper [27].

The fourth and fifth phases are beyond the scope of this study, requiring a long, tedious, and complex implementation procedure in a real-world environment as well as an impact study on both the society and economy. Hence, this manuscript concludes with recommendations derived in the third phase and references the remaining phases as future work. An initial step of the experimentation phase was conducted, which involved proposed policy validation, and was conducted through a second round of interviews and published in another study [27].

3.2. Interviews

A qualitative research interview is a structured discussion in which the interviewer solicits information and opinions from participants about a particular subject [45,65]. For this study, the purpose of conducting semi-structured interviews was to obtain perspectives from participants from the public, private, and academic sectors to (1) confirm the existence of the identified economic, demographic, and educational gaps regarding sustainable development, (2) categorize these gaps into major themes based on interviewee opinions, (3) identify any further gaps and challenges in response to RQ1, and finally, (4) propose recommendations in response to RQ2 that drive the quality of Qatar's human development toward sustainable development. We used semi-structured interviews for data collection, a procedure that establishes some structure through open-ended questions and allows interviewees enough flexibility to provide new insights [61,66]. Furthermore, semi-structured interviews suit this topic of investigation because they provide in-depth insights into human development challenges that Qatar faces and highlight a roadmap toward sustainable human capital development. Additionally, this format allows for follow-up questions and clarifications as deemed necessary [67,68]. Research was conducted between February 2021 and April 2021. Fifteen open-ended interview questions were designed to elicit further details pertaining to (i) the status of human capital development and (ii) Qatar's strategies to develop human capacity (see Appendix A). These open-ended questions were derived from (i) previous literature about human development, (ii) gray literature about Qatar, of which a major portion is incorporated in the previous section (such as the QNV2030 document, Qatar's national development strategies, and annual reports from Qatar's Ministry of Development and Planning and its Educational Ministry), and (iii) the purposes of this study. Each interview lasted between 30 and 45 min, and participant responses were

recorded in a "data notebook" to maintain confidentiality. Before the survey, a version of this questionnaire was pilot-tested with six colleagues (pre- and post-doctoral students and faculty with relevant research interests) and two potential study participants. These pilot interviews did not result in substantial modifications to the questions but were nonetheless helpful in refining them and in developing follow-up inquiries.

3.2.1. Sampling and Participant Selection

Using purposive sampling, we assembled 20 participants with a balanced gender distribution from a wide variety of backgrounds and qualifications (from the private, public, and academic sectors) to capture and integrate multiple perspectives to achieve a more advanced, holistic view of human development. The general criteria for selecting interviewees were that they had professional and relevant experience and were willing to offer perspectives on Qatar's attempts to transform its economy into a knowledge economy, and the country's human development needs and issues. More specifically, we identified people with sufficient knowledge and experience pertaining to human development practice, including policymakers, human resource practitioners from the private and public sectors, and academics and teachers with relevant disciplinary expertise. Using a purposive sampling procedure allowed us to gain an in-depth understanding of interviewees [69]. Besides purposive sampling, snowball sampling was conducted by asking those contacted to recommend others within or outside their organizations who might provide useful insights. Some participants had a great deal of experience and represented decision-makers in their fields; almost half also had experience in two or more sectors, adding valuable depth to the study. Informed consent was given by all study participants. Table 3 presents the demographics of interviewees.

Table 3. Background and characteristics of respondents.

Participant	Gender	Age	Qatari	Profession	Education
1	M	50s	No	Economic consultant	Ph.D.
2	M	50s	Yes	University president	Ph.D.
3	M	40s	Yes	Engineering director	Ph.D.
4	F	20s	Yes	Recruitment specialist	Master's
5	M	50s	No	University lecturer	Ph.D.
6	F	40s	No	Researcher	Ph.D.
7	M	30s	Yes	Assistant deputy minister	Master's
8	F	20s	Yes	Engineer	Bachelor's
9	M	60s	Yes	Former minister	Ph.D.
10	M	30s	Yes	Quality and planning	Bachelor's
11	F	30s	Yes	Engineer	Master's
12	M	40s	No	Secretary-general	Master's
13	F	50s	Yes	Former teacher/stay-at-home parent	Bachelor's
14	M	30s	Yes	Engineer	Master's
15	F	20s	Yes	Legal researcher	Bachelor's
16	F	20s	No	Lawyer	Bachelor's
17	M	30s	Yes	Manager	Bachelor's
18	F	30s	Yes	Engineer	Ph.D.
19	F	30s	Yes	Researcher	Master's
20	M	60s	No	Engineer	Bachelor's
Total:	20				

3.2.2. Thematic Analysis

Data from semi-structured interviews were transcribed and subjected to thematic analysis to identify significant elements related to topics arising from the current infrastructure in Qatar and the factors assisting or impeding the creation of a successful human development model suitable for Qatar. In conducting thematic analysis, we followed a six-step process recommended by [70]: (1) familiarization; (2) coding; (3) generation of themes; (4) reviewing themes; (5) defining and naming themes, and 6) writing up. Transcripts of the interviews were first read several times and manual coding was used to highlight the most frequent answers and categorize the responses. These responses were classified

into subthemes, which were then interpreted into themes. The research team reviewed these themes and subthemes to ensure that all data related to the research questions were included; Figure 6 illustrates these themes. Each (sub)theme helped illuminate topics relevant to this study. In defining and naming (sub)themes, each (sub)theme's exact meaning was formulated and its relationship to the research questions determined. We report the thematic analysis findings in the next section. From interview transcripts, relevant phrases were identified [71] and gathered into "codes" that represent a collection of similar phrases sorted into the same place [72]. Over 500 codes were initially identified in interviewee responses, which were then combined into potential themes [70]. Codes were merged, eliminated, and moved during further review. There was no limit to code reduction, which was based on information saturation and yielded three main themes and seven subthemes that demonstrated relevance to the research questions.

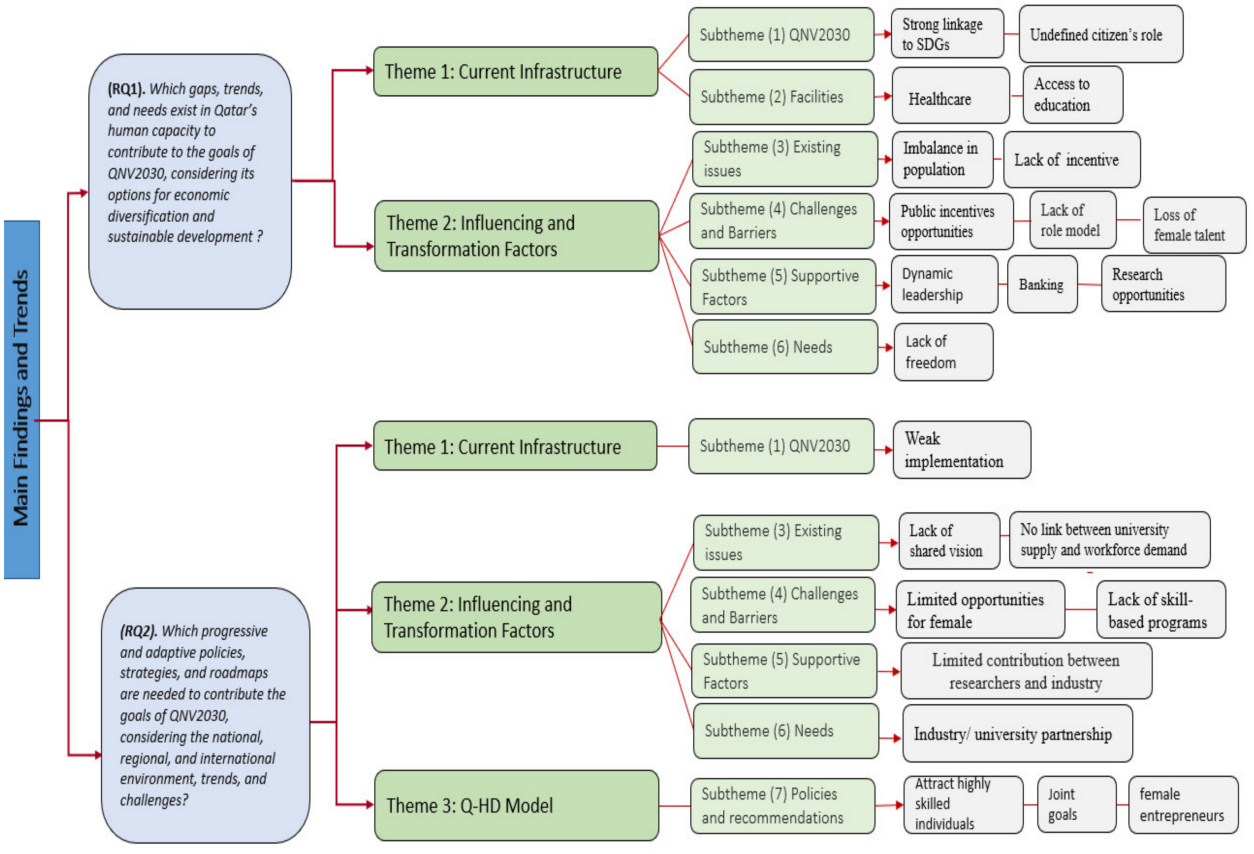

Figure 6. Interrelations between research questions, main themes in the interviews, and findings.

3.2.3. Validation and Trustworthiness

The supervisory committee members reviewed the interview questions in terms of language and applicability to the research questions. Based on their comments, interview questions were modified and improved as an initial review. Following that, three pilot interviews were conducted with participants to capture their opinions and observe the flow of discussion. This offered an opportunity to detect possible flaws at an early stage. As previously mentioned, pilot interviews resulted in only minor modifications to interview questions. Clarifications were provided where needed to ensure that each participant interpreted the questions similarly. The results were presented to most interviewees and interested readers in a follow-up survey and validation interviews [27].

4. Results and Discussion

As mentioned, the thematic analysis resulted in three main themes and seven subthemes, as shown in Figure 6.

4.1. Theme 1: Current Infrastructure

This theme is related to RQ1, and the responses focus primarily on the status of infrastructure in Qatar and its interaction with human capacity and sustainable development. They offer the opportunity to determine if Qatar possesses the required factors for developing its human capacity to support a knowledge economy. Under the theme of current infrastructure, interview responses contain two subthemes: QNV2030 and Facilities. Regarding QNV2030, most respondents saw it as a current driver of development. Respondents additionally noted that QNV2030 was developed to support high standards related to Sustainable Development Goals (SDGs) [73]. Their main concern was whether it was possible to achieve the targets set in QNV2030 by 2030. Participants also expressed concerns about the concept of citizenship; ideas of citizenship and belonging are poorly defined, and young people may not understand their importance in the development process. In particular, interviewees observed that the younger generation are not provided with the skill set to become effective community members. In addition, a sense of entitlement from being a Qatari citizen may not be ingrained in younger minds, leading to a lack of ambition and engagement among this population group. This absence of entitlement represents a concern not only on a personal level but on a societal level as well.

To develop the necessary human capacity through education, several institutions have been formed in Qatar. Such institutions were established to monitor and evaluate the performance of schools, teachers, and students, as well as support parental perspectives, as all of these factors are directly associated with human capital development [71,74]. However, interviewees from both the education sector and the broader economy considered the role of the evaluation authority in Qatar to be routine and repetitive, with no tangible outcomes or changes regarding the development of skills and talent.

The second identified subtheme concerns infrastructure and facilities. Most interviewees stated that Qatar has several supporting fundamentals required for human capital development. These include infrastructure items, such as transportation, energy, access to electricity and clean drinking water, a healthcare system, schools, and universities. These factors have a direct and positive impact on human development [74].

4.2. Theme 2: Affecting and Transformation Factors

In this section, we attempt to identify the affecting and transformation factors that influence the path of human development. These include demographic, social, cultural, and educational factors, as well as workplace environment. They are classified into the following subthemes: existing issues, challenges and barriers, supportive factors, and needs [75]. This section delves further into RQ1 and provides insights into RQ2. Concerning existing issues, demographics and current population structure were referenced by all interviewees, with particular emphasis on the current population's imbalance regarding gender, skills, and nationalities. Respondents also believed that, after the World Cup, the required skills for sustainable development must be examined and reviewed in terms of quantity and quality. Another existing issue is the conflict between educational projects and vision. A strong education system is a key pillar in human development [76]. However, interviewees saw a conflict between current educational projects and Qatar's desired human capacity and sustainable development. Primarily, respondents were concerned that Qatari men lack the incentive to pursue higher education. Another issue concerns the practice of the Ministry of Administrative Development, Labor and Social Affairs offering job contracts to university students during their studies, which discourages Qatari citizens from pursuing professional or academic ambitions. This practice seems to obstruct creativity, entrepreneurship, and innovation.

Furthermore, a high number of students graduating from secondary school are not qualified to enter university, with academic backgrounds that are too weak to meet the requirements of most universities. Many secondary schools have switched to Arabic as their language of tuition, yet both local and international universities use English as their primary instruction language [77]. Many students have thus lost their chance to pursue education because of language barriers, which is a major blow to the country's aim of increasing human capacity. Some interviewees referred to the policy of *Qatarization*, observing that if most Qataris studying in universities are assigned to jobs in the government, the private sector will remain un-Qatarized [78]. Additionally, some stated that collaboration between the education system and the workplace is weak. There are no clear requirements from the workplace regarding what majors are needed. This broken chain between supply and demand has many negative influences, including on finances and student motivation.

The second subtheme involves the challenges and barriers to achieving a knowledge economy. The opportunities in the public sector, mainly in the military, are attractive in terms of the privileges offered, making them likely to override other ambitions. Qatari men may thus question why they should pursue higher education when prestigious, secure positions are available to them at age 18. Another issue is the lack of role models. In addition, successful parents, who can be role models, are rarely highlighted in Qatar. Qatar depends heavily on expatriate teachers (around 95%). Most are women, who cannot necessarily be the best role models for Qatari boys [79]. A high number of Qatari female teachers likely went into teaching because cultural and social constraints made it their only suitable employment option [80]. Another significant challenge to human capital development is the loss of female talent [81]. Many educated Qatari women do not join the workforce, or they work in sectors different from their education major. Most interviewees considered this a significant issue and noted that its explanation is deeply rooted in local, social, and cultural aspects. Women are expected to concern themselves with marriage, children, and families. They are not assumed to have responsibilities that force them to work, but rather, are expected to be supported by a father and then a husband.

The third subtheme lists the supportive factors for human development. Almost all interviewees conveyed that Qatar's dynamic leadership supports initiatives to achieve their vision and accelerate development. This supportive factor is also reflected in countries that have experienced a structural change in their economy from a conventional state to one based on knowledge and human potential. These countries have experienced leadership that made timely decisions, reflecting a dynamic and efficient character [82]. Another supportive factor is the Qatar infrastructure for banking and transportation systems, which are considered important for development. One additional supportive factor for developing human capacity is the possibility of collaboration at research and development centers within the country [83]. The Qatar Science Technology Park (QSTP), Qatar University (QU), Hamad Bin Khalifa University (HBKU), and similar institutions must invest further in student development.

The fourth subtheme concerns needs and ideas for what human capacity should look like and what type of structure and skills it must adopt. Many respondents believed that society offers no freedom to participate in progress, intimating that their role in development seemed unknown or unvalued. Issues with workplace demand represent another consideration, as there is a lack of clear requirements regarding what the workplace requires and what universities should produce. This gap was explicitly noted in multiple interviews. Currently, university graduates are typically not recruited by suitable workplaces. Most academics interviewed observed that while many learners are being produced, they are not being aimed at any specified target. Similarly, interviewees from the public and private sectors stated that students learn material unnecessary in the workplace.

Several observations in our qualitative study confirmed existing thoughts on the status of human development in Qatar. First, interviewees showed awareness of the massive infrastructure investments that Qatar has undertaken and further iterated, in line with the literature [84,85], the positive relationship between infrastructure investments and

sustainable economic development. Second, respondents noted that a nation's competitiveness requires a knowledge economy focused on education [86]. However, Qatar falls short in educational outcomes. Third, respondents felt that Qatari men lack incentives to pursue higher education and upgrade their qualifications and that women must be more empowered in their professional growth to contribute further to society and the economy.

4.3. Theme 3: Human Development Model for Qatar

In the latter stage of the interview process, participants were asked what changes, policies, and initiatives should be introduced in Qatar to establish a human capacity model and strategy that supports QNV and aligns with SDGs. This theme provides further analysis for RQ2 of this research. First, Qatar must attract highly-skilled individuals to develop its economy and society. To contribute in a measurable way, highly-skilled expatriates must be offered residency, including a range of incentives and the fundamental rights enjoyed by Qatari citizens. Second, a social contract between the state and its citizens must be established. This social contract will define the rights of citizens and inspire them to work toward a common goal. Some participants indicated that general attitudes and mindsets of Qataris must be modified. They pointed out that the education system is an ideal starting place for changes to occur. If the paradigm embraced in Qatar changes and the country establishes a strong philosophy and vision, every strategy and policy can link back to this philosophical foundation.

The present education system in Qatar is fragmented, and each level of schooling has a development plan that is not integrated into a plan for the entire sector [87]. It is vital that universities, schools, and industries set joint goals and strategies and coordinate their aims and activities [88]. Many interviewees noted the importance of encouraging women to take on leadership positions and responsibilities. Since Qatar is a young, emerging country, it is essential to ensure that women have culturally and religiously appropriate support in the workplace. Additionally, entrepreneurship is a potential path for women in Qatar, and the government should invest in female entrepreneurs to boost their contribution to the economy. Attention must also be paid to the number of university majors in professional fields such as medicine and engineering who are likely to graduate soon [88]. Comparing this number to estimates of what Qatar will need and the number of positions that will require filling will help determine steps necessary to fill the gap.

5. Discussion

The salient factors from the statistics and the benchmarking study lead us to the following summary: (a) Qatar's hydrocarbon and construction sectors are the dominant contributors to GDP and growth, with a strong influence on the country's demographics and requirements for human resource development; (b) Qatar's expatriate population consists predominantly of men, most from emerging or relatively developing countries and with humble education backgrounds. These workers are mainly employed on contractual terms, providing unskilled or semi-skilled labor to infrastructure projects associated with the upcoming World Cup; (c) After secondary education, Qatari men are frequently offered lucrative jobs by the government, often in the police or military sectors. This process adversely affects their continuing professional development by undermining their motivation to pursue higher education; (d) Qatari women outnumber their male counterparts in tertiary education by a factor of three to one. However, despite this majority, they cannot gain employment or key positions in the male-dominated oil and construction industries. Moreover, sociocultural constraints often make them settle for less demanding urban jobs; (e) Although education statistics in terms of infrastructure, ICT adaptation, student–teacher ratios, and student–school ratios have improved significantly, these improvements are not yet reflected in the metrics surrounding quality of education. To achieve substantial progress, human development and the educational system must be aligned at all levels [89]. To create an innovative, sustainable-friendly environment, education, training, and research must be put in place, along with a political and regulatory climate that favors innovation;

furthermore, stakeholders across the education system must contribute to the sustainable progress of development.

We found several associations in our qualitative study that confirmed existing knowledge regarding the status of human development in Qatar. First, interviewees showed awareness of the massive infrastructure investments that Qatar has undertaken, and they also noted the positive relationship between infrastructure investments and sustainable economic development, which resonates with the literature [84,85]. Second, respondents observed that a nation's competitiveness requires a knowledge economy focused on education, but that Qatar falls short in educational outcomes [86]. Third, respondents acknowledged that Qatari men lack incentives to pursue higher education and upgrade their qualifications, while women lacked sufficient empowerment in their professional growth.

The qualitative survey revealed additional insights beyond these shared perspectives. Qataris may lack a sense of belonging, which is key to the feeling of citizenship. This sense of citizenship is among the most important factors in building cohesiveness and connectedness among members of a society. Since this social inclusivity is assumed to offer a pathway for innovation [90] and sustainable development [91], Qatari leadership should reinforce this feeling of citizenship. Furthermore, participants expressed that the process of *Qatarization* should factor in the labor market structure and education system of the country.

6. Framework and Recommendations for Qatar Human Development Strategy—Sustainable Development

The human capital strategy developed in 2009 has not been fully and successfully implemented because of continuously changing circumstances: oil crises, blockades by neighboring countries, new entrants to the natural gas market, and the recent COVID-19 pandemic. Thus, a new approach is needed to support the next phase of human development so that Qatar's population is proactively and dynamically aligned with the development goals and needs of a sustainable knowledge economy [92]. The findings from the previous sections and stakeholder feedback have been used to develop this framework, which completes the analysis of RQ2.

6.1. Description of the Qatar Human Development Framework (Q-HD FW)

The proposed framework suggests how human development should be promoted to create a progressive and versatile Qatar. QNV2030 outlines what Qatar wants to achieve. The signing of the memorandum on SDGs makes rapid agreement upon all desired goals even more critical. Thus, this framework might be described as a method of effectively promoting human development based on the country's core values, future vision as mentioned in QNV2030, and Qatar's commitment to SDGs. The framework, which aims to develop human capacity, would pave the way forward and undertake all responsibilities for creating a sustainable economy. The proposed framework has four building blocks, along with motivators and expected outcomes (Figure 7). Our model shows that in addition to a skills framework, health, citizenship, and leadership/management also affect the model.

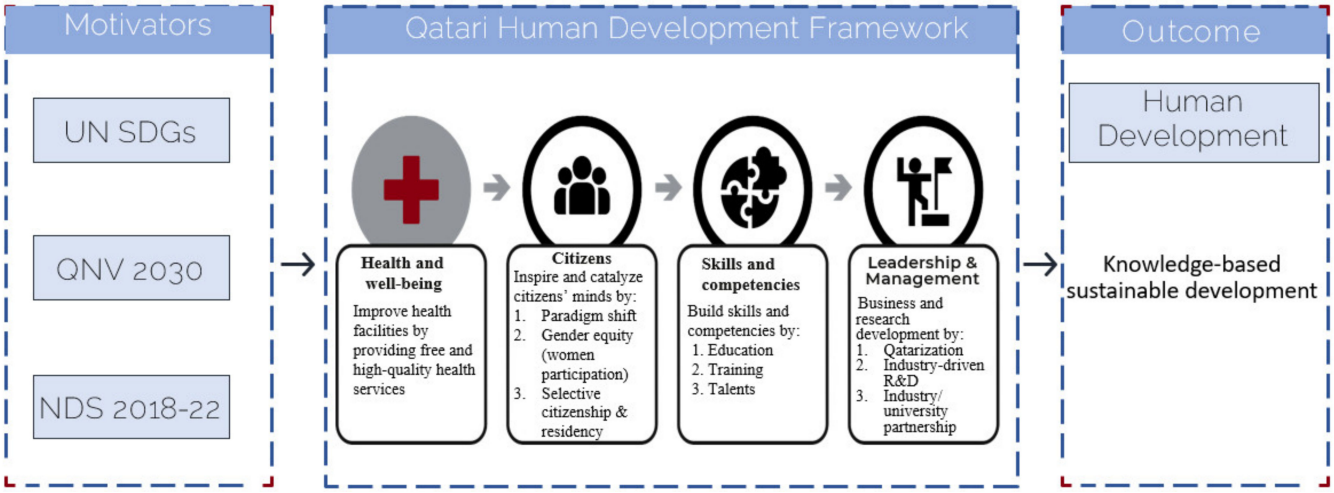

Figure 7. The proposed framework for the Qatar human development strategy.

Each component of the proposed framework follows a pathway toward improving human development; essentially, these components comprise the basic building blocks to improve human quality for the required economy (i.e., knowledge economy) and, consequently, sustainable development. A brief explanation of each component's target follows:

1. Health framework: the target of this framework is to develop a healthcare infrastructure that provides affordable, high-caliber healthcare services for all citizens and reduces infant mortality rate. It provides a healthy education and training infrastructure. The intermediate goal of the health framework is to develop institutions that provide affordable, accessible, and quality health services for all.
2. Citizenship framework: the target of this framework is to develop educated, talented, and participative citizens that recognize the cultural, religious, and heritage values of society while actively taking part in this transformation. The citizenship framework has an intermediate goal to develop citizens' attitudes toward others and themselves and ensure that they are socially interactive and economically and environmentally participative throughout the developmental stages.
3. Skills framework: this is the primary target, which promotes the mastering of skills and lifelong learning through an improved education system to yield economic gains. The intermediate goal is to significantly improve quality of education to address future economic and social demands.
4. Leadership and management framework: this framework aims to encourage and facilitate partnerships between industries, universities, K–12 institutions, and the government to promote technology development, research, and innovation. The intermediate goal of this framework is to provide efficient and effective e-services in all aspects of government, business, industry, trade, finance, and education, and to encourage domestic-related technology, ICT, research, and innovation.

The proposed framework advocates for a healthy citizen who is willing to appreciate their culture, society, and religion but also possesses the right capabilities and skills to adapt to changing conditions.

6.2. Recommendations for Qatar's Human Development Strategy

This section introduces and examines the most effective actions Qatar's government could undertake to improve its policies across educational, public, and private sectors. It is worth noting that the recommendations are designed to support Qatar's innovation, research, and knowledge development toward sustainable development. For a successful human development plan, it is imperative that each sector and individual at all levels recognize their role and play an active part in the plan's fulfillment [93]. Positions must be

clearly defined to avoid any ambiguity. The functions have been divided into three main sectors, described below.

6.2.1. Education and Higher Education

The education sector is the main contributor to human capital development in Qatar. Previous research has shown that education plays the most important role in health sector improvement, economic growth, and sustainable human growth by increasing workforce productivity, and providing a foundation for a successful democratic government [94]. Therefore, to achieve sustainable development, the education sector must become more adaptable and meet society's changing needs [95]. The education sector must work closely with other workforce sectors to ensure that education focuses on the areas required by the country for aiding its development. The role of the education sector is manifold: it must recognize demands, meet them by aligning itself to critical focus areas, coordinate and continuously access changing dynamics, prepare for unforeseen future requirements, promote the focus sectors through scholarships and incentives, inculcate a sense of tolerance and respect for people from other cultures with different values, and shape citizens of all backgrounds [96]. Our specific recommendations are:

- Building capacity by developing skills and talent through vocational and technical education;
- Improving K–12 education to make students more competitive and successful in reading, mathematics, and science;
- Innovation and entrepreneurship training and providing students and teachers at the K–12 levels with opportunities for experimentation;
- Wider inclusion of male Qatari citizens in the teaching career path through improvement of the current admission and evaluation procedures, and providing role models for increasing the teaching profession's attractiveness;
- Adapting higher education study programs to industry needs and adopting and developing new programs;
- Preparing, promoting, and empowering women and local academics, researchers, and leadership without sacrificing quality and high aspirations.

6.2.2. Government

The state plays a significant role in both shaping the plan and implementing it effectively. The state determines the overall target and direction for the project; thus, state institutions must be an active part of this change at the national and regional levels [97]. The state must also determine the distribution of responsibilities and develop committees to evaluate performance. Coordination among different state institutions, both internally and externally, would also fall to the state. In this regard, the government can:

- Promote entrepreneurship, particularly for female entrepreneurs and investors;
- Provide targeted naturalization and selective permanent residency for highly-skilled ex-pats.

6.2.3. Industry/Business/Private Sector

Significant contributions in the health and education sectors have primarily been made by the state. However, favorable government policies have also attracted the private sector. The private sector must contribute to the shift toward human development by understanding and applying government guidelines and coordinating with authorities to effectively follow the action plan [97]. Private sector investments in critical areas would pave the way for successful implementation of the proposed framework through the establishment of industry–university–government partnerships in education, training, and research. Business incubators are further recommended to diffuse knowledge and thus contribute to economic growth [98].

7. Conclusions, Limitations, and Future Work

Sustainable development requires meeting current needs without compromising future generations' resources, and human capital forms a crucial component [99–101]. The importance of human capital was recognized by the United Nations when they established the Sustainable Development Goals (SDGs) in 2015. Of these goals, the most relevant to human capital is SDG4, which aims to "ensure inclusive and equitable quality education and promote lifelong opportunities for all." As the rest of the world moves steadily toward embracing new technologies as a source of long-term growth, it has become clear that Qatar's path to sustainable development and diversification requires replacing the hydrocarbon-led economic model with a strategy for developing a knowledge-based economy in which the ITC sector and other high-value industries can thrive. This study aimed to develop a comprehensive framework to examine and assess the human development strategies of Qatar by exploring the developments introduced in multiple areas, including education, technology, economic diversification, and *Qatarization*. This exercise is vital, as Qatar faces considerable challenges in creating innovation building blocks and promoting innovation performance. We discuss the pathway by which Qatar can enhance understanding of human development strategies and transition from a resource-led growth model to a knowledge-based economy. More specifically, we assess the effectiveness of current education reforms and recommend strategies to address emerging policy challenges in Qatar. Such strategies could enable Qatar to achieve the SDGs and meet the needs of knowledge-intensive industries. The proposed framework can serve as a way forward for Qatar and other countries with similar educational and demographic dynamics where the framework could be adapted to various requirements. Research is lacking concerning countries in the Middle East; such a framework could thus present a stepping stone for Qatar, by which it could incorporate teachings from other countries that embarked upon similar transitions and achieved knowledge-based economies.

To gain better insight into these research aims, a qualitative study was conducted to gather the opinions and perspectives of various participants from the public, private, and academic sectors to explore the status of human development in Qatar and develop a better understanding of adopted strategies, existing challenges and issues, and contributions of different sectors to the development process. Furthermore, participant recommendations and suggestions for improving the human capacity required to support a knowledge-based economy in Qatar were gathered and reviewed. Interviews were analyzed using a thematic approach to identify significant elements related to themes arising from the current infrastructure in Qatar, and the affecting and transformation factors that are assisting or impeding the creation of a successful human development model for Qatar.

Based on literature review, observations, and interview results, this study proposes a human development framework for a progressive and versatile Qatar. The primary driver for this framework is the development of human capacity, which would pave the way forward and undertake responsibilities for sustainable development. The framework has four components: health, citizens, skills, and leadership and management. These four components can be described as a method of effectively promoting human development based on Qatar's core values, commitment to SDGs, and the country's future vision, as delineated in QNV2030.

Some key limitations in implementing the framework are related to the country's population, geography, and climate. The population growth rate is low and is expected to decline further. Hence, decision-makers must incorporate an export-based niche market to attract foreign investment. Furthermore, the geographical conditions and political factors of surrounding countries represent another crucial area of focus for decision-makers, since an effective framework for developing policies cannot be created without incorporating these risks. A proactive stance is needed to develop progressive human capacity policies and effective practices to increase retention rates, including transparent citizenship, long-term residency, and careful human resources practices. In addition, equal opportunity employment, business establishment, and sophisticated technological hubs are needed for

Qatar to transition from a rentier state to a knowledge-based economy. The government must develop specific policies and programs to diligently implement and continuously improve mechanisms that focus on such themes as "plan ahead and carefully," "efficiency always first," "first time right approach," "diligent cost-control," "speed," and "quality" for all operations of government, industry, and private sector investments and institutions. This is particularly important for educational institutions, as they shape the minds and hearts of future generations not only by teaching but also by doing it the right way. Only when this is achieved can the suggested framework help make the sustainability targets more meaningful and accessible while keeping Qatar's native population at the core of all human development.

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Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

A.1. Interview Guide: Below Are the Main Aspects/Areas of Focus in the Interviews

Qatar's current status pertaining to the knowledge economy;
Strategies adopted by Qatar for moving human capital to the knowledge economy;
Challenges faced in moving to a knowledge economy;
Qatar's future with regard to the knowledge economy;
Actions/sectors Qatar should take and invest in to move to the knowledge economy;
Strategies and steps taken for successful human resource development (what, who, and how);
Suggestions/recommendations to improve the knowledge economy in Qatar.

A.2. Interview Questions

Based on your background, experience, and knowledge, how do you think Qatar arrived at today's economic development status from the 1970s? What were the motivations, drivers, and challenges?

How do you think the human development aspect of the above changes played out? Equally developed? Stayed behind? Why?

What has played a critical role to allow human development to follow an equal trend or stay behind the economic development of Qatar since the 1970s?

In regard to the population in Qatar and Qatari population % today, how do you see their participation % in the Qatari workforce (in term of skills and education level)?

Do you think that the above % are sustainable? Why?

In terms of economic structure and development, please compare today's and 2030′s goals? Share of LNG revenues? Share of LNG in GDP? What are the gaps and why?

In terms of demographic structure and development, please compare today's and 2030′s goals? What are the gaps and why?

In terms of human capacity (education, knowledge, talent), structure, and development, please compare today's and 2030's goals? What are the gaps and why?

In terms of workforce/labor (skill sets, blue-collar vs. white-collar), structure, and development, please compare today's and 2030's goals? What are the gaps and why?

What should be the ideal economy sectors in 2030 for sustainable economy and development? Which sectors/industries should Qatar invest in and grow? Why?

How can ideal economic diversification (sectors, industries, businesses; talents, skills; financing) be designed? What are the factors and conditions for it?

What do you think Qatar should do now to achieve a sustainable economy and diversification in 2030?

What do you think the 2030 Human Capacity needs are? Which skills, knowledge sets, talents? Why?

How can the ideal human capital/capacity/development (education, health, population growth, Qatari vs. non-Qatari, male vs. female, high-skilled vs. low-skilled) be designed? What are the factors and conditions for it?

What do you think Qatar should do now to achieve the right human capacity development in 2030?

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