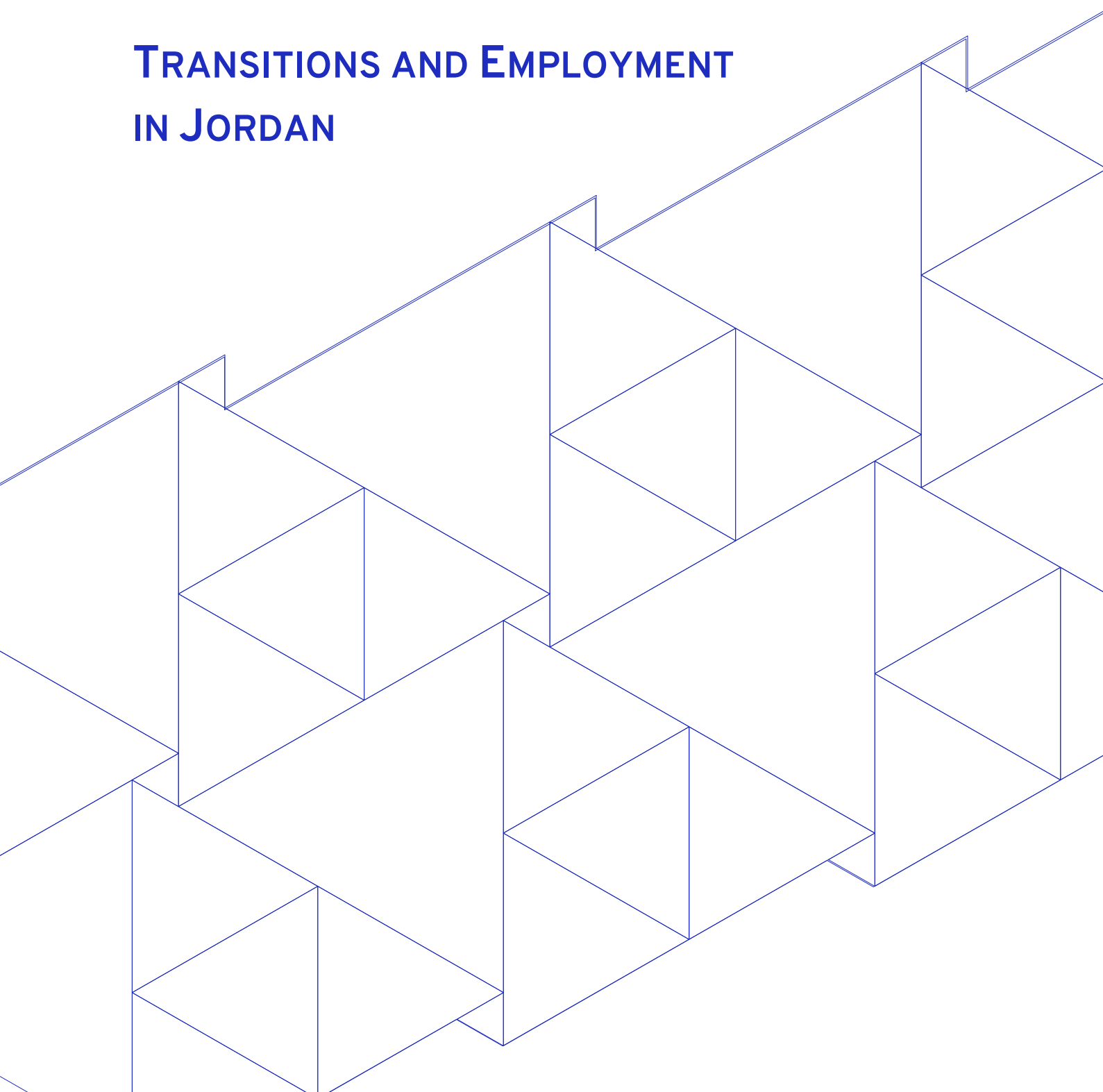




International
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SKILLS FOR GREEN AND DIGITAL TRANSITIONS AND EMPLOYMENT IN JORDAN



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► Table of contents

Acknowledgments	3
Acronyms	4
Executive summary	5
i. Purpose of the report	5
ii. Main findings and recommendations	5
I. Introduction	10
1.1. Economic overview	10
1.2. Education and training landscape	12
1.3. Methodology	14
II. Key findings by sector	16
2.1. Biofarming and agricultural technology	16
2.2. Renewable energy	21
2.3. Transport/E-mobility	26
2.4. Tourism/Ecotourism	28
2.5. Water management	31
2.6. Information and communications technology	33
III. Recommendations	39
References	45
Annexes	47
Annex I: List of stakeholders consulted	47
Annex II: Thematic questions for desk review	49
Annex III: Questions for stakeholder interviews	51

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This study has been produced with the financial assistance of the European Regional Development and Protection Programme for Lebanon, Jordan and Iraq (RDPP II), which is supported by the Czech Republic, Denmark, the European Union, Ireland and Switzerland.

The ILO Partnership with the RDPP II in Jordan aims to support the Government of Jordan (GoJ) and national constituents in responding to the youth employment challenge and supporting dialogue around policies and strategies for improving the livelihoods of young Syrians and Jordanians through evidence-based research and analysis.

Under the overall guidance of Tariq Haq, Senior Employment Policy Specialist at the ILO Regional Office for Arab States (ILO-ROAS), Aya Jaafar, Labour Economist at ILO-ROAS and Eman Alaraj, Project Officer at the ILO office in Jordan, coordinated the implementation of the project. Nabil Najjar, an independent consultant, conducted in-country key informant interviews with relevant tripartite stakeholders and drafted this research paper. Valuable feedback and suggestions were provided by Eman Alaraj and Aya Jaafar and a detailed review of the draft report was conducted by Kishore Kumar Singh, Senior Skills Development Specialist at ILO-ROAS.

Jad Yassin, National Project Officer at ILO-ROAS, proofread the final draft of the report and Patricia Newbery provided professional editing. Salwa Kanaana, ILO Regional Communication and Public Information Officer, and Tatiana Khattar, ILO consultant, provided support in the design and publication of the report.

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Acronyms

CPF	Crown Prince Foundation
CVDB	Cities and Villages Development Bank
EU	European Union
EV	Electric vehicle
GEF	Global Environment Facility
GG-NAP	Green Growth National Action Plan
ICT	Information and Communications Technology
ILO	International Labour Organization
Int@j	Information and Communications Technology Association - Jordan
JCSS	Jordan Centre for Strategic Studies
JCI	Jordan Chamber of Industry
JEA	Jordan Engineers Association
JSF	Jordan Strategy Forum
JTB	Jordan Tourism Board
MENA	Middle East and North Africa
NARC	National Agriculture Research Centre
NET	National Employment Training Company
NGO	Non-governmental organization
PV	Photovoltaic/photovoltaics
RDPP	Regional Development and Protection Programme
RSCN	Royal Society for the Conservation of Nature
RYSE	Resilient Youth, Socially and Economically Empowered
SSC	Sector Skills Council
TVET	Technical and vocational education and training
TVSDC	Technical and Vocational Skills Development Commission
USAID	United States Agency for International Development
VTC	Vocational Training Corporation

► EXECUTIVE summary

i. Purpose of the report

Within the framework of the Research Partnership for Improved Livelihoods of Jordanian and Syrian Youth between the International Labour Organization (ILO) and the Regional Development and Protection Programme for Lebanon, Jordan and Iraq (RDPP II), this study was conducted to assess the potential for a green and digital transition in Jordan and provide policy recommendations to improve the employment prospects of young Syrians and Jordanians in sectors with high potential to create green and digitally enabled jobs. The report also seeks to provide a better understanding of the wider skills climate related to these sectors and identify specific skills gaps and priority areas for future intervention.

The key sectors examined are:

- biofarming and agricultural technology;
- renewable energy, with a focus on grid maintenance, electricity management and solar and photovoltaics;
- e-mobility, with a focus on electric vehicles and associated infrastructure;
- tourism and hospitality, with a specific focus on ecotourism;
- water management; and
- information and communications technology (ICT), with a focus on business process outsourcing, and the potential of the 'gig economy' and digital labour platforms.

ii. Main findings and recommendations

Green transition: Policies and prospects

In the last two decades, Jordan's policies and priorities have reflected the Government's concern for environmental issues and green transition, promoting investment in green sectors and generating green jobs. Four key green sectors – agriculture, water, ecotourism and renewable energy – have attracted considerable investment and technical support from development partners, especially the Global Environment Facility (GEF), the World Bank, the European Union (EU), the United States Agency for International Development (USAID), Japan, Germany and others. Only the renewable energy sector has received adequate private sector investment, with a focus on conservation, green transition and job creation.

The 2017 Green Growth National Action Plan (GG-NAP) 2021-25 made the green transition a national priority. It aimed to expand the country's climate and sustainable development ambitions by mainstreaming them into sectoral strategic frameworks. The Government has accordingly developed sector-level action plans for each of the priority green economy sectors: agriculture, tourism, transport, waste management and water.

The **agriculture** sector GG-NAP aims to increase opportunities for farmers and rural communities to improve their skills and access to finance to promote sustainable livelihoods and decent, green jobs in the sector. It does not focus on sustainable organic farming, however. The EU-supported National Strategy and Action Plan for Sustainable Consumption and Production 2016-25, developed under the SwitchMed programme, seeks to promote integrated pest management, organic farming and green enterprises, and establish networks for Jordan's organic farms and/or link them with existing sustainable industries networking platforms and facilities.¹ Biofarming, a key sub-sector, provides substantial opportunities for aquaponic and hydroponic farming, land management and irrigation. The EU-supported Organic Ecosystem project across six different countries in the region and the efforts of some non-governmental organizations (NGOs) to promote organic farming are also significant, despite the missing focus on sustainable eco-friendly farming in national programmes and provision.

While significant progress has been made to formalize training in the sector, there is an urgent need for improved targeted training in these green and technology-driven subsectors for youth employment. The technical skills required for sustainable agriculture include reducing the ecological footprint of agricultural production, using soils and biomass as carbon sinks, watershed management, enhancing biodiversity on a landscape level, tightening nutrient flows, integrated pest management, and production of organic fertilizer. Agronomists and senior staff in natural resources-related industry need communication and leadership skills to promote sustainable agriculture. Digital skills, branding and marketing skills are also key for the promotion of biofarming.

Furthermore, Jordan is one of the leading countries in the Middle East and North Africa (MENA) region in **renewable energy** (RE) adoption and clean energy growth. The focus of the National Energy Strategy 2020-2030 is to advance energy security by improving energy efficiency, energy-mix diversification, increasing the share of renewables in the entire energy mix, reducing carbon emissions and bringing down energy costs. Roughly 20 per cent of the electricity grid is powered by solar or wind energy. In 2021, renewables accounted for 26 per cent of Jordan's energy production, while natural gas accounted for 73 per cent, down from 80 per cent in 2020.² The Jordanian renewable energy sector has already attracted over US\$5 billion in investment and has benefitted from a great deal of government support, including policies encouraging solar and photovoltaic uptake. This, coupled with the introduction of a smart electricity grid, will create significant opportunities for trained electricians, grid maintenance staff, smart meter installers and manufacturers and solar panel installers and maintenance staff. Urgent action is needed to upgrade skills training to ensure the availability of skilled individuals before the skills mismatch widens considerably and the skills shortage becomes acute.

¹FAOLEX Database, <https://www.fao.org/faolex/results/details/en/c/LEX-FAOC178828/>

² Petra – Jordan News Agency. 'Twenty-six per cent of Jordan's energy in 2021 came from renewables'. https://petra.gov.jo/Include/InnerPage.jsp?ID=43933&lang=en&name=en_news

The **transport sector** is another building-block of the green transition. Growing at a rate of 5.3 per cent per year, it contributes 16 per cent of the country's total greenhouse gas emissions, making it the second largest contributing sector.³ It also contributes over 9 per cent of Jordan's GDP and employs nearly 7.6 per cent of the total workforce. With more than 18,000 electric vehicles (EVs) on the streets in 2018,⁴ Jordan is considered a pioneer in promoting electric vehicles, despite related infrastructure challenges. To capitalize on this trend, the training of mechanics should be broadened to include electric vehicle engines, in addition to combustion engines, and should be accompanied by specialized training for electricians, engineers and urban planners on the installation, maintenance and expansion of vehicle charging infrastructure and the wider electricity grid.

The Economic Modernization Vision sets out the ambition of providing 99,000 jobs over the next ten years in the **tourism** sector, in a push to deliver sustainable growth. It indicates that tourism, and in particular accelerated promotion of ecotourism, has great potential to create jobs and boost the local economy, especially with the revival of tourism after the pandemic. Since the establishment of the first biosphere reserve in Dana in 1993, ecotourism has grown tremendously in Jordan as a result of environmental pressures and the demand for jobs outside the big cities. In addition to some NGOs and small and medium-sized enterprises, the Royal Society for the Conservation of Nature (RSCN) is largely responsible for promoting ecotourism.

After operating for a few years in Dana, the RSCN expanded ecotourism programmes to the Aljoun, Wadi Mujib and Azraq Wetlands reserves. The RSCN's policy aimed for 100 per cent local employment in all its protected areas, so that ecotourism would directly support around 160,000 families. In 2000, USAID also began supporting the development of Jordan's ecotourism industry as a means of creating jobs in rural communities. Overall, Jordan can leverage its cultural, environmental and heritage assets to promote itself as an 'eco-destination'. To do so, a workforce with specific skills will be required to act as ecotour guides, park rangers, conservationists, green facilities managers, branding specialists and ecotour operators with sufficient knowledge to deliver world-class ecotourism experiences for visitors from around the world. The current skills supply is inadequate and fails to meet the demand for skills in the sector, including soft skills.

Transforming challenges into opportunities: Green jobs in the water sector

Jordan is one of the most **water**-stressed countries in the world. Significant population and income growth, urbanization and the expansion of irrigation farming are constantly increasing the demand for water, while climate change is expected to further exacerbate water scarcity. The need to improve the availability and sustainable management of water and wastewater, which was emphasized by the Ministry of Water and Irrigation in the National Water Strategy 2016-2025, has led to increased investment in and expansion of the sector.

³ Global Green Growth Institute. *Report: Jordan Green Growth National Action Plans 2021–2025: Transport Sector*. 2020 <https://gggi.org/report/jordan-green-growth-national-action-plans-2021-2025-transport-sector/>

⁴ Friedrich Ebert Stiftung *Recommendations on E-mobility in Jordan. Based on a delegation trip to Germany*. 2019. (2019)

The Strategy is also driving employment creation, in water management, construction, and infrastructure maintenance, as well as water supply and sanitation. The key occupations in demand include plumbers, welders, water distribution operators and supervisors, wastewater treatment and maintenance operators and supervisors, and engineers. Combined with adequate skills training programmes, sustainable water management is a significant opportunity, not only to create more green jobs, but also to improve the resilience of the country in the face of a deteriorating natural environment and a depletion of water sources.

Digitally enabled sectors: Growth, job creation and skills mismatch

The **information and communications technology** sector is one of the fastest growing sectors in Jordan and contributes about 4 per cent of GDP. In the last two decades, the country has emerged as a regional ICT hub, and aims to attract further investment to the sector. In 2019, the Government established a new Ministry of Digital Economy and Entrepreneurship. Its current National Digital Transformation Strategy and Implementation Plan 2021-25 aims to enhance the digitization of government services, improve connectivity and create at least 50,000 direct jobs in the digital sector by 2025.⁵ With approximately 928 companies, most of them micro, small and medium-sized enterprises,⁶ Jordan attracted US\$1.1 billion of announced cross-border greenfield foreign direct investment (FDI) in ICT between 2010 and the first half of 2021. The current REACH 2025 Initiative, launched in 2016, aims to increase the revenue of the digital economy sector by 25 to 30 per cent, creating 130,000 to 150,000 jobs and between 5,000 and 7,000 new businesses by 2025.

As a result of the exponential growth of this sector, job opportunities for software, app and web developers, coders, videographers, graphic designers and systems engineers continue to grow. Educational outcomes continue to be misaligned with private sector and labour market needs, however. As a result, as few as 10 per cent of graduates are 'market ready'. The skills shortage in this sector is one of the biggest challenges for investors in Jordan. For example, of the 8,000 graduates every year with specialization in ICT, only about 7.5 per cent go on to work in the field.⁷ Furthermore, despite the demand for broadcasting and audiovisual technicians, riggers and cable splicers, electronic mechanics, and services, most technical and vocational education and training (TVET) institutes do not offer courses on these skills in demand in the market. This is largely because of limited understanding of market needs in the education and skills system. Graduates' lack of the soft skills and English language abilities necessary for ICT jobs further hinders their ability to effectively participate in the sector. The competency-based training system is gaining ground, but the reform process is slow and not aligned to market needs.

⁵ EU-OECD Programme on Investment in the Mediterranean. *Promoting investment and business climate reforms in Jordan's ICT sector*. Issues paper for a public-private dialogue. (2022)

⁶ EU-OECD Programme on Investment in the Mediterranean. *Promoting investment and business climate reforms in Jordan's ICT sector*. Issues paper for a public-private dialogue. (2022)

⁷ EU-OECD Programme on Investment in the Mediterranean. *Promoting investment and business climate reforms in Jordan's ICT sector*. Issues paper for a public-private dialogue. (2022)

Just transition means collective transition

One of the key findings of this study is an apparent disconnect between the country's green growth ambitions and job creation potential in green sectors, as reflected in its policies and plans, and the education and skills system responsible for creating a skilled workforce. The ministries responsible for delivering technical education and skills are missing from the plans and policies reviewed, as is any commitment to investment in improving the skills governance and skills system to bring it into line with the requirements of the sectors leading the green and digital transitions. The most serious concern is that the current pace of skills reform, including skills investment and available skills infrastructure and facilities, is inadequate and too dependent on external agencies to produce the workforce needed to achieve the targets of green growth and a digitally enabled economy. The skills landscape, especially skills governance and skills investment in competency-based training and the related skills infrastructure, need urgent attention to bring them into line with the country's ambition for green growth and a digitally enable economy. In this context, the ministries directly responsible for green and digital transition should be required to connect with and support technical colleges, the Technical and Vocational Skills Development Commission (TVSDC) and the sector skills councils, which have played a critical role in coordinating human resource development needs and facilitating development partner investment, including donors and technical agencies, in skills development to reduce the skills mismatch and skills shortages.

Building on all of this, and while sector-specific measures and initiatives are of paramount importance, the availability of skills is a cross-sector issue and is linked with the Government's overall approach to planning and investment. Most importantly, multi-stakeholder coordination and collaboration is central to designing and implementing green growth actions and can maximize co-benefits.

I. INTRODUCTION

1.1. Economic overview

The economy of Jordan continues to follow a stubbornly low growth trajectory. Data from the World Bank show that GDP grew on average by 2.1 per cent annually between 2010 and 2021.⁸ According to the Jordan Department of Statistics, in the second quarter of 2022, GDP growth registered 2.9 per cent, compared to the same quarter of 2021.⁹ GDP growth in neighbouring Egypt and Iraq has outstripped that of Jordan in each of the last eight years.¹⁰

This is, in part, due to Jordan's geographic location, surrounded by constant political, economic and military volatility, as well as the effects of the 2008 economic crisis and the COVID-19 pandemic, both of which adversely impacted the country's economic resilience and stymied economic growth.

Nonetheless, even during periods of high economic growth, the Jordanian economy has failed to create sufficient jobs, much less decent jobs, for its growing labour force. Total unemployment rate stood at 17.8 per cent in the second quarter of 2022, and was even higher among Jordanians, at 22.6 per cent.¹¹ Youth were particularly affected, with youth unemployment running at almost twice the rate for the overall population, at 41.5 per cent, in the second quarter of 2022. Young women registered staggering rates of unemployment, with more than half of the young female labour force (50.6 per cent) unemployed, compared with 39.6 per cent of young men.¹² The employment ratios for vulnerable young males (12.4 per cent) and females (1.6 per cent), those from lower socio-economic backgrounds and those with disabilities, further demonstrate that the labour market remains exclusive.¹³

The challenge of youth unemployment is not new, and the Jordanian private sector has not been able to create enough decent jobs, especially in the green and ICT sectors, to keep pace with the growing number of university and technical and vocational education and training graduates seeking to enter the workforce. A study by the European Bank for Reconstruction and Development (EBRD) estimates that 70,000 Jordanians join the labour force each year, while fewer than 30,000 jobs are created annually, most of them governmental, municipal or military, as opposed to being in the private sector.¹⁴ While job creation in the ICT sector has been increasing, the same cannot be said of the green sectors, except for the demand for professional skills in the renewable energy sector. As a result, up to 75 per cent of skilled

⁸ World Bank Data.

⁹ Department of Statistics.

¹⁰ World Bank Data.

¹¹ Department of Statistics.

¹² Department of Statistics.

¹³ UNESCO Institute for Statistics.

¹⁴ UNESCO Institute for Statistics.

graduates are unable to find employment within a year of finishing their studies and the private sector is unable to create enough jobs to accommodate new labour market entrants.¹⁵

Jordan's long-standing economic challenges are further complicated by the more than 676,000 Syrian refugees currently residing in Jordan, only 133,500 of whom live in refugee camps,¹⁶ making Jordan host to the second largest number of Syrian refugees per capita in the world, after Lebanon.

These challenges come at a time when the global economy is in a state of transition, with increasing worldwide awareness of the need for green transition and more sustainable economies and societies, backed by global political will, best demonstrated during the COP-26 Summit in Glasgow in 2021.

Economic and environmental policies are becoming more aligned as a result of the global climate change imperative, supported by increased political will, and the fact that this transition will play a greater role in both economic cooperation and development support. This brings with it the possibility of unlocking green development potential and promoting the creation of a circular economy in Jordan. The Green Growth National Action Plan 2021-25, adopted in 2017, made the green transition a national priority, and included the aim of expanding the country's climate-aware and sustainable development by mainstreaming it in sectoral strategic frameworks.

In response to these economic and employment challenges and to capitalize on the global green and digital transitions, the Jordanian Government has launched the Economic Modernization Vision, an ambitious plan to reinvigorate and modernize the nation's economy that seeks to engage with international green growth trends, facilitate new investment in Jordan and create jobs.

Launched in June 2022, the Vision comprises 366 initiatives across 35 sectors and is built around eight key drivers:

- Future services – develop a high-value, export-oriented service economy;
- Destination Jordan – turn Jordan into a destination for cultural and nature tourism;
- Smart Jordan – develop human resources to meet future skills needs;
- Sustainable resources – optimize the use of natural resources to ensure sustainability;
- Invest Jordan – stimulate domestic and foreign investment;
- Green Jordan – promote sustainability and climate adaptation to enable growth;
- Vibrant Jordan – improve citizens' quality of life;
- High value industries – turn Jordan into a regional industrial hub.¹⁷

This plan to reposition the Jordanian economy is underpinned by a pledge to create one million new jobs by 2033, but will come at a cost of over 41.4 billion Jordanian dinars (JD), to be met through government financing, foreign and donor investment, local funding and future GDP growth.¹⁸ Whether it can be delivered in full remains to be seen, but it comes as a clear signal

¹⁵ EBRD. Jordan Diagnostic 2020, p.15. (2020).

¹⁶ Office of the United Nations High Commissioner for Refugees (UNHCR).

¹⁷ Economic Modernization Vision.

¹⁸ Economic Modernization Vision.

that the Jordanian Government understands the challenges it faces and has defined a pathway towards future growth.

Both green and digital industries will be central to all eight of these pillars and sectors, including renewable energy, water management, agriculture, ecotourism and information and communications technology, while digital enablement will be integral to the success of the Vision. The growth of these specific economic sectors and the skills development aspects called for by the Smart Jordan pillar chime with the purpose of this report.

1.2. Education and training landscape

As Jordan is a country with a rapidly growing youth population and a distinct lack of natural resources, the Government considers well-educated human resources to be a key priority and an area of major potential and in 2019 allocated 9.9 per cent of its total annual expenditure to education. Nonetheless, overall education expenditure as a percentage of total spending is lower in Jordan than in neighbouring countries, including Egypt (12.3 per cent) and Iraq (14 per cent) and is comparable with Lebanon (9.9 per cent).¹⁹

Despite this lower expenditure, according to the most recent data, the secondary school enrolment rate of 61.7 per cent exceeds the rates of Iraq, Lebanon and Syria.²⁰ The tertiary education enrolment rate stood at 33.6 per cent in 2020 and males and females have similar educational outcomes.²¹

Jordan's education and training ecosystem is guided by a series of national policy documents and strategies, which set out the structure, governance and functioning of education and training institutions, the most notable of which are:

- the National Strategy for Human Resource Development (2016-2025);
- the Ministry of Education Strategic Plan (2018-2022);
- the Jordan National E-TVET Strategy;
- the Technical and Vocational Skills Development Act, No. 99 of 2019.

Higher education is offered at thirty-three universities, ten of which are public, with the remainder being private, and over 300,000 students enrol in higher education every year.²² The existing training and education system in Jordan is delivered through several pathways available to students on completion of basic education (grades 1-10). Alongside access to university or community college education, students can access technical and vocational education and training, but enrolment in upper secondary or tertiary programmes is low and totalled just 45 per cent in 2017

Technical and vocational education and training in Jordan is delivered through education providers and technical and community colleges, such as the Al-Balqa Applied University and

¹⁹ UNESCO Institute for Statistics.

²⁰ UNESCO Institute for Statistics.

²¹ UNESCO Institute for Statistics.

²² European Training Foundation. *Jordan: Education, training and employment developments*, p.6. (2020)

other accredited vocational training institutions. Additional training providers include the Vocational Training Corporation, which is a semi-autonomous entity established in 1976 and overseen by the Ministry of Labour. It offers vocational training across the Kingdom and runs forty-two vocational training institutes across all governorates.²³

The Government of Jordan has always acknowledged the importance of technical and vocational education and training and sought to tackle related misperceptions, but the employment success of those who do vocational training is undermined by weak governance, the poor quality of instruction and lack of relevance or responsiveness to market needs.

Despite its expanded capacity and various reform initiatives, the technical and vocational education and training system in Jordan fails to meet the needs of employers. It is reported that, *'in addition to skills mismatches at all levels of employment, graduates of the TVET system are unable to meet skills demands in light of technological advancements in the labour market'*.²⁴ These shortcomings were recognized in the National Strategy for Human Resource Development, which acknowledged that technical and vocational education and training provision was fragmented, lacked high-quality training, had failed to provide consistent pathways enabling students to progress to higher levels of training and suffered from poor employer perceptions of its quality and the employability of graduates.²⁵

To address these challenges, the Technical and Vocational Skills Development Act was adopted in 2019 and established the Technical and Vocational Skills Development Commission (TVSDC). This body seeks to formalize and professionalize the governance of the TVET sector, raise its profile, ensure that it contributes to job creation and ensure that graduates of TVET programmes have the technical expertise and skills required to meet the needs of the labour market or engage in entrepreneurial activities.²⁶

The establishment of the Commission has been hailed as a major achievement for the technical and vocational education and training sector in Jordan, helping to formalize and standardize training provision. This has been followed by the adoption of new by-laws on the equivalency of TVET certificates, accreditation of new providers and improved criteria for the selection and classification of TVET trainers.²⁷

In addition, a number of sector skills councils have been, or are due to be, established to ensure that training outcomes align with the needs and expectations of employers. Such councils already exist in the garment and textiles, chemicals, manufacturing, tourism, energy and water, and ICT sectors. While the councils have the potential to engage in skills governance and coordinate sectoral skilled workforce requirements, they are currently limited by statute to an advisory role, rather than an active role in skills governance and skills delivery. If this continues, there is a risk that the private sector will disengage from the process.²⁸

²³ UNESCO Institute for Statistics.

²⁴ EBRD. *Jordan Diagnostic 2020*, p.18. (2020)

²⁵ National Strategy for Human Resource Development, p.29.

²⁶ Technical and Vocational Skills Development Commission website.

²⁷ European Training Foundation. *National Qualifications Framework – Jordan*, p.11.

²⁸ ILO. *State of Skills, Jordan*, p. 35.

Jordan has, however, taken significant steps to strengthen skills governance and improve private sector participation by developing market-relevant curricula and training, but many challenges remain in this regard.

The education and training system needs to develop a '*well-trained, skilled and diverse workforce*',²⁹ which will be required most acutely in the green and digitally enabled sectors discussed throughout this report. To address these challenges, the National Strategy for Human Resources Development should be updated and new curricula introduced. At the same time, new centres of excellence for research are needed, along with improved infrastructure and a new approach to digital learning and the skills that support green transitions in the priority sectors identified by GG-NAP 2021-25. All this can be delivered through stronger labour market partnerships, improved programmes and enhanced financing tools for institutions.

1.3. Methodology

The research methodology blended qualitative and quantitative analyses derived from secondary research and primary stakeholder consultations to develop a clear and coherent picture.

Based on initial research, the following six thematic areas were identified to form the basis of the desk review and primary research:

- biofarming and agricultural technology;
- renewable energy and energy efficiency;
- tourism and ecotourism;
- transport and e-mobility;
- water management and water technology;
- information and communications technology

Desk review

A desk review was conducted, drawing on government strategy documents, national research and international sources to guide the research and validate sector shortlisting. A list of key questions for the desk review is set out in Annex II.

Stakeholder mapping and engagement

The objectives of the stakeholder mapping were to identify a set of key stakeholders who could inform the research and validate initial conclusions drawn from the secondary review. It sought to ensure identification of relevant stakeholder groups, including government ministries, private sector representatives, non-governmental organizations, representatives of academic institutions and training providers to provide a complete picture of the policy environment on both the supply side and the demand side.

²⁹ *Economic Modernization Vision* p.73.

The mapping exercise focused on identifying the relevant organizations, as opposed to individuals. Stakeholder organizations were selected based on legislative, executive and advocacy functions, their expertise in specific sectors or their perspective on the overarching theme of research. Where organizations or ministries were approached, it was left to them to identify the staff member best qualified to inform the research.

Interviews were conducted with stakeholders, including representatives of government ministries (Ministry of Youth, Ministry of Labour, Ministry of Energy and Mineral Resources, Ministry of Digital Economy and Entrepreneurship, Ministry of Industry, Trade and Supply and Ministry of Tourism and Antiquities), senior private sector representatives (including representatives of major advocacy organizations (such as the Jordan Chamber of Industry (JCI) and the Information and Communications Technology Association - Jordan (Int@j)), representatives of education and training (such as the University of Jordan, Al-Balqa Applied University, the Technical and Vocational Skills Development Commission and sector skills councils) and NGO staff operating in relevant fields. The full list of interview questions is presented in Annex III of this report.

Analysis and validation of findings

This research is mainly based on (1) qualitative analysis, derived from the secondary sources, of how sectors and associated policies have evolved over time, and (2) a review of the initiatives of the different institutions interviewed and consulted.

II. Key FINDINGS BY SECTOR

2.1. Biofarming and agricultural technology

In Jordan, agriculture is already an established economic sector, 11.5 per cent of total Jordanian land area being designated as agricultural land, according to the World Bank. This has remained largely constant since records began in 1961, with the overall percentage of land dedicated to agriculture fluctuating within narrow parameters of 10.9 and 13.2 per cent.³⁰ Jordan's agriculture is increasingly productive and, as of 2020, the sector contributed about 5.9 per cent of total national GDP and accounted for 15 per cent of total export value. It was also responsible for 1.15 million metric tons (MT) of carbon dioxide equivalent in 2017, however.

The direction of agriculture sector development is largely determined by the National Strategy and Action Plan for Sustainable Consumption and Production 2016-2025, and, more recently, by the Green Growth National Action Plan 2021-25, with many overlapping objectives to promote sustainable agriculture that contributes to green growth, and a focus on improved production and enhanced natural capital, social development, climate change mitigation, improved efficiency and job creation. The National Strategy and Action Plan for Sustainable Consumption and Production for the agriculture, transport and waste management sectors is implemented to mainstream sustainable consumption and production as part of a comprehensive approach to the transition to a green economy. Implementation is expected to result in job creation and improved economic competitiveness and sustainable development. It is estimated that the Action Plan will attract sustainable green investments amounting to US\$1.3 billion dollars and create 51,000 new jobs by 2025. The National Biodiversity Strategy and Action Plan 2015-20 and the Climate-Smart Agriculture Action Plan, supported by International Bank for Reconstruction and Development (IBRD)-World Bank are policy documents that also provide guidance and support for sustainable agriculture.

In order to make agriculture more productive and sustainable, these action plans focus on: agricultural investment policies to increase agricultural productivity; bringing a sustainable consumption and production focus to public land-use policy for optimal land use to increase yield; introducing fiscal instruments favouring sustainable agriculture and food manufacturing practices and providing incentives for good environmental practices (such as integrated pest management and organic farming), and tax exemptions or tax relief for sustainable agriculture/organic farming green entrepreneurs; removing incentives related to water tariffs in order to maintain the sustainability of surface and groundwater resources and introducing incentives to use drought-resistant seeds and drip irrigation system; controlling the quantity of water extracted from wells to prevent salinization and using waste water in areas close to

³⁰ World Bank Data 1961-2018. Agricultural land (percentage of land area) – Jordan.

treatment plants to irrigate forage crops or other crops not consumed directly by people; and promoting renewable energy-powered irrigation systems.

The key challenges facing implementation of these strategies and plans at the governance level include weak institutional mechanisms for policy coordination across sectors and subsectors, scattered interventions to address environmental challenges, the lack of a comprehensive results framework with a robust monitoring mechanism and gaps in investment and policy intentions. At the operational level, there is a range of obstacles to achieving the ambitions of these plans, including: a larger proportion of natural resource consumption and degradation than any other sector, particularly in terms of water and land resources; an increasing rate of land degradation and desertification of agriculture lands; land fragmentation; livestock overgrazing; shrinking biodiversity; limited irrigation facilities and shrinking water resources; lack of incentives and support for biofarming, etc.

A major challenge facing the sector is resource efficiency and use. As of 2018, only 8.3 per cent of agricultural land in Jordan was irrigated, compared to 20.2 per cent in Lebanon and 33.5 per cent in Israel.³¹ Jordan's food production index stood at 94.6 in 2019 (the most recent available), leaving the country reliant on food imports and amplifying the risk of food insecurity in the future, in light of the persistent rise in food prices around the world.

Organic farming and biofarming technologies are growing in popularity. The Government of Jordan is aware of this opportunity and, as of 2021, over 15,000 square metres of land were already farmed organically. This is supported by the programme Boosting Cross-Border Organic Ecosystem through Enhancing Agro-food Alliances and has already led to improved awareness of the environmental, economic and health benefits of organic farming.³²

Despite such progress and innovations, the sector has not yet fully adopted biofarming technology-driven approaches in its processes, further straining already scarce resources in the country, especially water. Production methods remain water- and labour-intensive and dependent on livestock cultivation, which is more land- and resource-intensive than arable farming.

The high input costs associated with some elements of hydroponics and other new technologies such as permaculture, aquaponics, conservation agriculture, grafting, integrated pest management and nutrient film techniques, have created constraints. A new model, whereby the Government provides land at a low rent and waives electricity costs for new biofarming initiatives, has started to bring down the barriers to entry for new farmers. Emerging sustainable agricultural practices and technologies have the potential to create new job opportunities.

³¹ World Bank Data 2001-2018. Agricultural irrigated land (percentage of total agricultural land) – Jordan

³² *Jordan Times*. 'Agriculture Ministry prepares ground for organic farming'. (2021)

The support provided by the Government and regulators to encourage farmers and entrepreneurs to deploy more sophisticated approaches in the sector or invest in technological innovation is inadequate.³³ This view was echoed by various stakeholders, who said the sector remained largely traditional, both in terms of the technology deployed and the choice of crops planted. There is clear evidence that Jordan lags behind in terms of efficiency of land and resource use. The sector also fails to make the most of new agricultural technologies, such as hydroponic systems and innovative horticulture. Introducing digital techniques into agricultural processes and decision-making would improve the productivity and efficiency of the sector and support water and energy conservation.

It is hoped that the Ministry of Agriculture's National Strategy for Sustainable Consumption and Production will deliver improvements. The challenging economic situation has created increased demand for livelihood opportunities, but to enable the agriculture sector to capitalize on this, it is essential to guarantee full-time decent employment and find ways to reduce informality.

It should also be noted that the agriculture sector has considerable potential to provide decent work to more Syrian refugees and thus increase growth.

Key subsectors

In the context of green and digital job creation, the key agricultural subsectors with potential to promote biofarming include integrated pest management, organic fertilizer production, hydroponics and food processing. Numerous measures have been taken to support the growth of these subsectors and increase their prevalence.

According to the Jordan Chamber of Industry, food processing is a key opportunity area, driven by a booming fertilizer sector and strong relationships between phosphate companies and fertilizer manufacturers. This has resulted in a vibrant export sector and strong supply for the agriculture sector.

It is apparent that these subsectors, while separate, are linked. One major challenge emphasized throughout primary research is a mismatch between market demand and the products grown by farmers, which acts as a brake on the agriculture sector.

The National Agricultural Research Centre (NARC) considers the food processing sector to be particularly promising from a green jobs perspective, emphasizing that the greening of the whole value chain, including planting, transportation, packaging and sale, would deliver an overall improvement to the sector. It was also optimistic about hydroponics and aquaponics, notwithstanding the fact that the very high input costs associated with hydroponics are a key constraint.

To reduce these financial barriers to entry, UNICEF, through its Learning to Earning platform, is working with the Government to open access to land for new hydroponic farming initiatives. It uses a model whereby the Government provides land at a low rent and waives electricity costs,

³³ Sixt and Poppe (2019), p.18.

allowing farmers to overcome this barrier to entry. If expanded, a model of this sort could help scale up the sector, create economies of scale and generate additional livelihood opportunities.

The Cities and Villages Development Bank (CVDB) has also recognized the job creation potential in this sector and has piloted hydroponic farming projects in certain municipalities. According to reports, these pilots have been hampered by a lack of mandate on the part of the municipalities themselves, however.

Skills gaps

Demand for skilled workers in the agriculture sector is growing and, as green agricultural industries expand, job opportunities in sustainable agrarian development will become more evident.

As start-up and technological costs diminish, opportunities will arise for farmers skilled in green agriculture and technology, agricultural engineers, water managers, irrigators and land managers. There will be particular demand for individuals skilled in hydroponic and aquaponic farming techniques, which appear to be areas of high potential growth. Product marketers and brand managers able to leverage the locality of food production will see an increase in demand and entrepreneurship opportunities brought about by facilitated access to agricultural land, and those with experience and understanding of biofarming techniques will be well-placed to take advantage of this.

To ensure that these opportunities are accessible, training provision must keep pace with technological development, and the deployment and use of those technologies by the industry should be encouraged. At present, technical and vocational education and training centres do not offer any agri-tech curricula for sustainable farming. NGOs have stepped in to offer training in this field, with the ILO, UNICEF and others running specific programmes on green and biofarming.

The ILO Prospects programme has sought to increase technical and vocational education and training opportunities in this sector and has supported the development and operationalization of a sector skills council for agriculture, in addition to providing support for on-the-job training. It conducted a needs assessment of farming skills, followed by training in key skills such as pruning, harvesting and post-harvesting, in association with the Jordan Agricultural Engineers Association. Technical training or support has been provided to over 3,000 young people and over 3,600 agricultural workers were reached through awareness-raising efforts, resulting in over 3,400 new job placements.³⁴

Furthermore, through the ILO project “Decent Work in Jordan’s Floriculture Sector”, occupational standards for planting, cutting and grading flowers have been validated and relevant training materials developed. This was accompanied by practical training for over 1,050 Syrians and Jordanians, which covered technical skills and occupational safety. Specific, targeted programmes of this nature that focus on one aspect of a diverse sector, can be replicated in other green and technology-driven subsectors.

³⁴ ILO (2022). *ILO Prospects at a Glance*, passim.

UNICEF has initiated training activities in collaboration with the private sector to understand product demand. After determining the needs of the market, young people are trained to establish and maintain hydroponic farms with a focus on the wider value chain. The training starts with a focus on interpersonal and leadership skills development, followed by technical training in new agricultural technologies such as hydroponics.

Through its Organic Ecosystem project, the Ministry of Agriculture has also run a series of workshops designed to provide participants with the tools and skills they need to develop their organic farming business plans, although this appears more weighted towards entrepreneurship than employment.

Despite a series of attempts by NGOs and the private sector to fill this void, the training landscape remains incomplete, with particular concerns expressed by some stakeholders about the inability of university and technical training to provide sufficient skills in this sector to enable people to engage in the labour market. This emphasizes the need for specialized institutions to provide education in modern agricultural mechanisms and processes, accompanied by marketing and branding support. This training package falls under the banner of 'smart agriculture'.

The Jordanian Chamber of Industry is planning to leverage its strong relations with sector skills councils and the Technical and Vocational Skills Development Commission to establish a new sector skills council for food processing, which, if realized, would add great value to the sector. The National Agricultural Research Centre has introduced its own training to help young people enter this market. The programme includes the provision of soft skills such as leadership and communication, business management and understanding of the green economy and its impact on job roles. Training also extends to marketability challenges and marketing skills, coupled with support in networking with local buyers and tourism companies with which they can engage commercially. The Jordanian Farmers Union has also signed a memorandum of understanding with several universities, including Mutah University, Yarmouk University, the University of Jordan, Al Albayt University and the Jordan University of Science and Technology, to provide graduates with technical training.

Ensuring better alignment between the agriculture sector and the manufacturing and food processing sectors is an essential first step as it will ensure that farmers deploying these new farming techniques are able to find a market for their produce. This will, in turn, justify the investment required and the move away from conventional farming techniques.

Mass production of organic products remains a challenge as Jordanian factories struggle to find enough local raw materials year-round. If the resource efficiency of farming mechanisms were optimized, output would increase, and the sector would boom. To bring this about, farmers need support in developing their planning and forecasting skills to ensure consistent supply, bio-storage facilities, and standardized prices, regardless of seasonality.

2.2. Renewable energy

Jordan is one of the leading countries in the Middle East and North Africa region in renewable energy adoption and clean energy growth. Its National Energy Strategy 2020-2030 focuses on advancing energy security by improving energy efficiency, energy mix diversification, increasing renewable energy as a share of the entire energy mix, reducing carbon emissions and bringing down energy costs. Roughly 20 per cent of the electricity grid is powered by solar or wind energy. In 2021, renewable energy accounted for 26 per cent of Jordan's energy production, compared with 73 per cent from natural gas, down from 80 per cent in 2020.³⁵

The renewable energy sector in Jordan has already attracted over US\$5 billion of investment from a combination of domestic and foreign private sector investors and international donors, mostly driven by the growing solar and photovoltaic technology sector, and has benefitted from considerable government support, including a policy encouraging solar and photovoltaic uptake.

The National Green Growth Plan sets out a course for Jordan to achieve an expanding yet sustainable and resilient economy that ensures the creation of green jobs for its citizens and increased investment in green projects. Of total jobs in the renewable energy sector in 2016, 71 per cent were in the electricity, gas, steam and air-conditioning supply subsector (excluding utilities), representing roughly 12,913 jobs. In 2020, a study combining an employment-factor analysis and input-output modelling concluded that in Jordan some 5,000 people worked directly or indirectly in the renewables field, in addition to more than 6,000 working in energy efficiency (lighting and buildings), making a combined total of 11,300 jobs. Women held only about 5 per cent of the jobs (8 per cent in solar and only 1 per cent in wind).³⁶ As investment in the sector continues, new employment opportunities are expected to be created. It is estimated that the sector could employ as many as 65,000 people in the coming years.³⁷

This, coupled with the introduction of a smart electricity grid, will create significant opportunities for trained electricians, grid maintenance staff, smart meter installers and manufacturers and solar panel installers and maintenance staff, which requires urgent action to upgrade the skills training system to ensure the availability of skilled individuals before the skills mismatch widens considerably and the skills shortage becomes acute.

The Jordanian Government hopes that the green growth transition in the energy sector will increase employment opportunities in the sector, especially for women and young people. This is explicitly referenced in the Jordan Economic Modernization Vision, which calls for the expansion of renewable energy, including new sources of energy and the promotion of improved energy efficiency.³⁸ The Vision's goals also include improving the affordability of clean

³⁵Petra – Jordan News Agency. 'Twenty-six per cent of Jordan's energy in 2021 came from renewables'.

³⁶IRENA and ILO. *Renewable Energy and Jobs. Annual Review 2021*.

³⁷Cote (2019).

³⁸Jordan Economic Modernization Vision, p.30.

energy, ensuring reliable and sustainable supply and enabling refugees and host communities to access adequate and affordable energy supply.

Interviews with representatives of the Ministry of Energy and Mineral Resources confirmed that the energy strategy aims to achieve 31 per cent of energy production from renewable sources by 2030. This will require 3200 MW of storage capacity, 2250 MW of which has already been installed. The Ministry expects to exceed this target, reaching 40 to 50 per cent of energy from renewables by 2030, enabling Jordan to export electricity to neighbouring countries.

Increased investment in solar energy brings new opportunities. A labour market assessment shows that employment in the manufacture and distribution of solar energy products is constant, while employment in solar project development, construction and installation is dependent on the steadiness and continuity of project flow, as employment tends to be project-based.³⁹ The Jordan Engineers Association also sees great potential in this sector as a catalyst for job creation, a mechanism for environmental protection and a vehicle for improving standards of living.

Specific jobs and opportunities in this sector include electrical engineers, project planners, civil and electrical engineers, operators and junior technicians for maintenance and operation, all of whom will be required to support the scaling-up of the renewables sector, particularly in relation to the relevant subsectors set out below.

Nonetheless, concerns remain that the scaling-up of the renewable energy sector in Jordan could be hindered by a lack of sufficient government support, which is needed to drive up investment and tackle the skills shortage. There is concern about the stability of the grid and its flexibility to integrate higher renewable capacity. A new long-term strategy would go some way towards allaying these concerns.⁴⁰ Stakeholders commented that, following an initial boom in the sector resulting from government and private sector investment, frequent policy changes, especially around the import and use of new technology, which requires government permits, have created concerns among investors and decision-makers.

Key subsectors

Two primary subsectors of the renewables sector were identified for analysis: electricity management and grid maintenance; and solar and photovoltaics.

In light of the current tumult on the global energy market, many European firms are exploring new opportunities in renewable energy. Green hydrogen is one energy source in which Jordan has seen increasing investment, often in collaboration with European partners.⁴¹ According to the Ministry, this has great potential for future job creation in the country. Similarly, Jordan has two wind farms in operation in Tafileh and is exploring the potential for future investment. Work

³⁹ RYSE. *Employment and market systems assessment in Jordan*, p.11. (2021)

⁴⁰ Res4Medi. *Scaling up renewable energy development in Jordan*, p.9. (2019)

⁴¹ "The future of green hydrogen in Jordan", *The Jordan Times* [online article], 17 January 2022; "Jordan, Norway to ink deals in green hydrogen, renewable energy exploration", *The Jordan Times* [online article], 4 December 2022.

is also ongoing on rare earth elements and lithium location and extraction, which will be key to the future of the automotive sector globally. Again, this programme remains in its infancy.

Electricity management and grid maintenance

Data from the International Energy Agency (IEA) show that, prior to the onset of the COVID-19 pandemic, Jordan's electricity production had risen dramatically, from 11.67 terajoules (TJ) in 2015, to 26.3 TJ in 2019, driven largely by a massive upswing in the amount of electricity generated using natural gas, which rose from 1296 GWh in 2014, to 16,603 GWh in 2019.⁴²

Building on the rapid expansion of electricity generation capacity, the Ministry of Energy and Mineral Resources confirmed that the grid could become an effective source of livelihoods generation as part of the transition to renewable energy. Anyone, whether household or business, can install up to 1 MW of renewable energy generation, subject to available grid capacity. This has the potential to create employment opportunities in the field of installation and grid maintenance. Any installation above 1 MW requires ministerial approval.

Furthermore, the Ministry of Planning and International Cooperation confirmed that, in line with the Modernization Vision, the power sector would be transformed into a 'smart power system', with a delivery strategy to be published soon.⁴³ This would result in a smart tariff system with associated data management systems, and smart metering in place in households and commercial premises. This initiative will require manpower to deliver, both in terms of installation and maintenance.

This area has also been prioritized by the Cities and Villages Development Bank through the Renewable Energy Fund and the Governorates Development Fund, providing loans and partnership funding for projects outside Amman. Through this fund, any project that delivers livelihoods can be funded below market price.

Using energy policy to support economic development is a concept well understood and recognized by the Cities and Villages Development Bank, which has provided funding for municipalities to convert street lighting to LED lighting within 18 months, the cost savings from which can be extended to livelihood generation. This is part of the wider renewables fund, which it is hoped will see municipalities reach energy neutrality within three years, generating skilled jobs in the process.

These initiatives are significant in their ambition and scale and, in addition to the direct jobs generated through installation and maintenance, have the potential to act as catalysts for further livelihood generation and enhancement throughout the construction, manufacturing and logistics elements of the supply chain.

Skills gaps

The Jordan Chamber of Industry, the formal representative of the industrial sector, which represents 240,000 employers and 25 per cent of Jordan's GDP, has conducted a gap analysis of the energy sector, which highlights skills gaps resulting from a lack of market-relevant

⁴² International Energy Agency website.

⁴³ Comments made by Ministry of Planning and International Cooperation representatives during stakeholder interviews.

training programmes offered by academic and private sector training providers. Outcomes indicated that, in addition to infrastructure knowledge, energy management itself was a key missing skill.

Existing training for electricians and grid managers delivered at a tertiary level or through technical and vocational education and training does not cover practical applications and needs underpinned by theoretical education, and this is particularly true of sustainable energy management. Electrical technicians graduate from training providers without sufficient knowledge or practical experience of how to apply the techniques they are taught. As a result, the labour force requires additional specific training by employers before they can enter the labour market.

Energy service providers continue to suffer from a lack of trained technicians. Despite the high numbers of engineering graduates in Jordan, most lack the required skills and specialized training. It has been suggested that graduates from indirectly related fields like mechanical or electrical engineering could be cross-trained and transition into the sector to compensate for this.

Curricula need to be readjusted to ensure that practical applications are taught, not just in classrooms, but also through hands-on training. The Chamber of Industry is working with the Technical and Vocational Skills Commission and the sector skills councils to close these skills gaps and is advocating for active private sector engagement in the process, to ensure that educational outcomes are better aligned with labour market needs.

To narrow this gap further, it has been suggested that the occupational standards being piloted by sector skills councils in the garment, plastics and chemical industries should be replicated for the energy sector. It is reported that these proposals have been awaiting the approval of the Technical and Vocational Skills Development Commission for over a year, however. Moreover, any moves in this regard must be accompanied by concerted efforts to improve public perceptions of vocational training.

It is vital that the importance, role and installation and maintenance of smart meters are understood as their rollout is ramped up in the coming years. This must be embedded in training and education curricula immediately.

The Jordan Engineers Association has acknowledged these shortcomings and been active in developing a training centre, which is working to ensure that engineers graduating from Jordanian universities are qualified for the labour market and able to adapt to regional and local trends in technological change. To this end, the Association has engaged with universities and training providers to support the improvement of training and educational outcomes so that graduates have the skills the labour market needs. As part of this programme, virtual learning tools and videos have been developed and workshops livestreamed. The Association cooperates closely in this area with the Ministry of Energy and Mineral Resources but expressed concern about the lack of availability of government funding for this initiative.

The Ministry of Planning and International Cooperation seems to believe that the issue of skills is market-driven and should not be the direct responsibility of the Government. It sees training as something to be delivered by the private sector: if companies intend to invest in projects, they must develop local resources and, if necessary, train their own staff. The role of Government is to facilitate this training, or introduce new courses at universities, technical and vocational education and training centres and in the market. A new means of training provision is required, run by the private sector, the government focus being on the promotion of investment to bring these projects to fruition.

Solar and photovoltaics

Solar and photovoltaics are seen as the most viable and investment-worthy energy interventions and have already seen significant growth in usage and in the wider economic value they provide. Ultimately, however, significant development in the sector will stem from the delivery of government decarbonization targets and a desire to see Jordan become an energy exporter. The cost of energy, coupled with pressure that might arise from new green economic deals with the United States and Europe, will necessitate a transition to green energy generation in the coming years.

To bring this about, the Government could stimulate demand and support the transition towards solar and photovoltaic energy production at both the industrial and household levels. The current cost of energy and the global trend towards green energy are catalysts for this transition and will help the Government raise awareness of the opportunities for businesses and families to save money by making this transition. This will lead directly to greater livelihood opportunities in a sector that is already growing.

This must be accompanied by a concerted effort to improve the regulatory mechanisms regarding new technology. Primary research revealed that investors seeking to introduce new photovoltaic technology for smaller projects found it difficult to obtain clear information from the relevant authorities on the procedures in place. Furthermore, the current process for gaining approval for the deployment of new technology has been described as ‘slow and opaque’. Reports from Jordan’s Green Entrepreneurs Network highlight serious challenges with project implementation. Investment opportunities have been limited by inadequate government support, absence of concise legislation and difficulties faced in the licensing process.

Consumers and households understand their personal economies, while the use of credit offers has made installation more financially accessible.⁴⁴ The prospect of energy bill savings, coupled with the reduced costs of products and installation costs, has generated increased demand, which is likely to continue in the coming years and drive healthy growth in labour demand in the sector.

Skills gaps

⁴⁴ Comments of the Jordan Strategy Forum during primary research.

To satisfy growing demand, the private sector needs more engineers to install and maintain solar and photovoltaic infrastructure. The Resilient Youth, Socially and Economically Empowered (RYSE) report highlighted that discussions with National Employment and Training (NET) had shown that more technicians were needed for the installation and maintenance of solar energy cells. It also reported that, while installation was more labour-intensive, most providers offered warranty-based services. This provided employment opportunities in maintenance, and self-employment opportunities in maintenance and installation in homes.⁴⁵

It is hoped that the German Energy Academy in Jordan will become a specialized training facility to upskill technicians in innovative and sustainable energy technology and that this will support Jordan's ambition to become a regional energy hub and create more employment in the sector.

One of the major challenges in this subsector is informality and short-term employment as work tends to be seasonal and project-based, so skilled staff are retained for a period of a few months to deliver specific installation or maintenance projects, as opposed to being able to rely on permanent employment.

Luminus, a private training centre, is delivering a training programme that combines training in photovoltaics and solar with traditional skills such as electrical engineering and plumbing. This is to ensure that trained individuals can access other employment opportunities, ensuring their employability and supplementing their workload until the sector has reached maturity and is able to provide secure, full-time jobs. Luminus electrical training diplomas, degrees and short courses in this field qualified 163 people during 2021-22, up from 141 the previous year.

The Training and Vocational Skills Development Commission needs to introduce such courses, which should be standardized and lead to skills certification to support renewable energy transition, ensuring technical compliance.

2.3. Transport/E-mobility

The transport sector is another building-block for achieving the ambition of a green transition. Growing at the rate of 5.3 per cent per year, it contributes 16 per cent of the country's total greenhouse gas emissions.⁴⁶ This makes it the second-largest sector in terms of carbon emissions. It contributes over 9 per cent of Jordan's GDP and employs nearly 7.6 per cent of the total workforce, equal to about 126,000 jobs in 2017.

The Transport Green Growth National Action Plan 2021-2025 presents a green growth framework and actions for the sector, aligned with Jordan Vision 2025 and nationally determined contributions (NDCs) under the Paris Agreement. It acknowledges the potential of electric public transport and promotion of private electrical vehicles in achieving the goal of green growth, but highlights the lack of strategy or official e-mobility policy adopted by the Government. In view of the challenges to promoting this subsector of transport, in 2019, the

⁴⁵ RYSE. *Employment and market systems assessment in Jordan*, p.11. (2021)

⁴⁶ Jordan Green Growth National Action Plans 2021–2025: Transport sector.

Friedrich-Ebert-Stiftung (FES) regional project on Climate and Energy Policy made a series of recommendations to the key stakeholders, which include the Ministry of Transport, the Ministry of Environment, the Ministry of Energy and Mineral Resources, the Energy and Minerals Regulatory Commission (EMRC), the Greater Amman Municipality, the Electric Vehicles Association (EVA) and Jordanian civil society. The recommendations mainly focus on policies related to infrastructure, financing, research and awareness and private sector development.⁴⁷

Despite infrastructure challenges, Jordan remains relatively advanced in the promotion of the shift to electric vehicles. With more than 18,000 electric vehicles on the streets in 2018⁴⁸ and a 40 per cent increase (600 vehicles customs-cleared) in demand in 2022,⁴⁹ the emerging e-mobility subsector shows great promise of expansion of the industry and of livelihoods generation. This spike in uptake is driven by factors that include rising fuel costs, international advertising and messaging and global supply chain shortages affecting the supply of internal combustion engine-driven vehicles.

The shift towards electric vehicles was amplified by the 2021 supply line agreement between Jordan and China, which reduced import costs and stabilized the supply of vehicles to the Kingdom. The tax on electric vehicles has remained steady at 10 per cent.

This upsurge in electric vehicle sales, bolstered by international demand and shifting buying patterns, shows no sign of abating and brings significant potential for livelihood generation, both in terms of the sales and maintenance of the vehicles themselves and the associated infrastructure requirements for public and private charging facilities.

To this end, the Royal Economic Vision called for the promotion of electric vehicle use and instructed the Government to develop a strategic plan for electric vehicles, including infrastructure, vehicle charging stations, demand analysis over 15 years and assisting the availability and location of charging stations. This would help develop the infrastructure and be delivered in partnership with the private sector. During consultations, the Jordan Strategy Forum expressed confidence that, with the right public awareness efforts and a structured approach, the sector is capable of delivering at least 5,000 new jobs.

Skills gaps

E-mobility is a new technology requiring both the training of new mechanics and engineers and the upskilling of the existing labour force in the context of its growing market and job creation. The workers required include mechanics specialized in electric vehicle engines, electricians capable of installing and maintaining charging facilities at household, industrial and municipal levels, urban planners who can embed this technology into future urban design, and electricity grid engineers able to support the increase in grid capacity required for this increased charging infrastructure.

⁴⁷ Friedrich Ebert Stiftung *Recommendations on E-mobility in Jordan. Based on a delegation trip to Germany*. 2019. (2019)

⁴⁸ Friedrich Ebert Stiftung *Recommendations on E-mobility in Jordan*.

⁴⁹ *Jordan Times*. "High fuel prices accelerate demand for electric cars, says stakeholder" (2022)

The sector is in its infancy and maturity is a few years away, so there is time for preparation and implementation of market-relevant accredited training that allows people to take full advantage of this opportunity. For this to be implemented, the Training and Vocational Skills Development Commission and technical universities need to establish partnerships with the private sector, especially the Electric Vehicle Association and the relevant ministries, to identify priority occupations and required competencies to design and plan accredited training, including apprenticeships, aligned with the needs of the marketplace. The Ministry of Youth has confirmed that a memorandum of understanding is now in place with technical and vocational education and training providers to ensure that, in future, vocational training centres are able to provide specific training in electric vehicle maintenance.

In partnership with a private company, UNICEF recently initiated technical and vocational education and training in electric and hybrid car maintenance, which is designed to help young people establish their own businesses or seek employment in larger companies. Demand is strong and has already translated into employment. Training institutes need to be equipped to deliver practical learning on new technology engines using up-to-date equipment.

The Jordan Strategy Forum reported that both the German Jordanian University and Al Balqa Applied University have seen this potential and are developing relevant vocational training. Private sector training providers have also begun incorporating specific training on electric vehicles into their wider mechanics training. For example, in 2021-22, Luminus delivered such training to 233 individuals for the second year.

As mentioned above in relation to training in solar and photovoltaic technology, hybrid training should be offered in the interim to allow graduates and trained individuals to access a broader pool of opportunities until such time as the sector matures sufficiently to guarantee sufficient demand to support secure full-time employment. Equipping engineers and mechanics to service, maintain and safety-check both electric vehicles and combustion engine vehicles will allow them to secure short-term employment and transition their livelihoods in line with the transition of the e-mobility sector.

2.3. Tourism/Ecotourism

The hospitality and tourism sector has played an important role in the economic growth of Jordan, the tourism sector alone accounting for 12.5 per cent of GDP in 2018.⁵⁰ In the same year, it accounted for 7.3 per cent of total employment in the Jordanian economy and the Government expects this figure to reach 8.4 per cent by 2028, with the sector contribution to GDP rising to 22.3 per cent in 2027.⁵¹ This progress was derailed significantly by the pandemic, but the Government expects the sector to rebound in the medium term, while adopting a short-term focus on increasing domestic tourism and developing capacity through planning and organization.

⁵⁰ RYSE. *Employment and market systems assessment in Jordan*, p. 9. (2021)

⁵¹ Ministry of Environment. *Green Growth National Action Plan 2021-2025: Tourism Sector*, p. xiv. (2020)

The Government has identified tourism as a major pillar of the country's future green economy, having included it as a central pillar of the Green Growth Plan. The National Tourism Strategy 2021 seeks to develop the themes of the Green Growth report, while focusing on driving the sector. Further building on this, the Economic Modernization Vision sets out the ambition of providing 99,000 jobs in the sector over the next ten years in a push to deliver sustainable growth.⁵²

Tourism is seen as a 'low hanging fruit' for youth employment, but youth are employed largely in hospitality work and trained Jordanians are going abroad because the local hotel market is saturated. One single push would not result in sustainable jobs, as tourism is currently seasonal and geographically isolated around key assets like Petra. The clusters around Petra are small compared to what is happening internationally and the offer at Petra and other hubs should be expanded to make them destinations in themselves, with experiences and infrastructure in place. Similar systematic interventions based on building the offer and sustainability of local communities around Jordan's archaeological sites is better suited to fostering growth and decent job creation.

Ecotourism

The role of ecotourism in the wider sector, both as an international emerging market and as a catalyst for green jobs in the sector, is of particular interest. Since the establishment of the first biosphere reserve in Dana in 1993, Ecotourism in Jordan has grown tremendously due to environmental pressures and the demand for jobs outside the big cities. In addition to some NGOs and small and medium-sized enterprises, the Royal Society for the Conservation of Nature (RSCN) is largely responsible for promoting ecotourism. After operating in Dana for some years, the Royal Society expanded ecotourism programmes to other reserves in Aljoun, Wadi Mujib and the Azraq Wetlands.⁵³ In 2000, USAID began supporting the development of Jordan's ecotourism industry as a means of creating jobs in rural communities. The Royal Society policy aimed for 100 per cent local employment in all their protected areas, resulting in ecotourism directly supporting around 160,000 families. Jordan is well-placed to leverage its cultural, environmental and heritage assets to promote itself as a world-leading 'eco-destination'.

Ecotourism was consistently referenced as a key priority area by stakeholders across Government, implementing agencies and the private sector. The Ministry of Tourism and Antiquities confirmed that ecotourism was high on their agenda and that they are actively involved in product development, skills development, improved marketing and heritage protection as key pillars of the National Tourism Strategy. Senior officials at the Ministry stated that all ministry programmes are being aligned with these ambitions and that it is setting standards and criteria for sustainable and ecotourism.⁵⁴ This work is still in its early stages, but the ambition is clear. The Ministry hopes to integrate these standards into legislation in due course.

⁵² Economic Modernisation Vision to provide 99K jobs in tourism sector (jordanvision.jo)

⁵³ Sullivan, Kathy. "Jordan's Natural Bounty Becomes a Boon for Locals and Tourists". *Frontlines*, USAID.

⁵⁴ Comments made by senior officials during primary interviews.

The Ministry is also aware of the need to embed livelihood creation in this ambition and believes that ecotourism will be among the most viable sectors for job creation in the coming years, especially in rural areas, as it can reach communities beyond the major cities in a way that is impossible for traditional employers like the construction and manufacturing sectors. The Ministry of Youth also sees ecotourism as one of its biggest opportunity areas, as the sector has continued to grow, despite regional political instability.

The workforce of the ecotourism programme in the Royal Society for the Conservation of Nature Ajloun Forest Reserve has grown from one employee in 1987 to 101 employees today, and the site has been expanded to include accommodation for 140 people, alongside a range of ecotourism activities. This model has been replicated across the Society's other reserves and has triggered similar private sector initiatives in the surrounding areas, demonstrating that sectoral expansion is feasible if the right infrastructure is in place.

Despite this great potential, more could be done by the Government, and the Ministry of Tourism and Antiquities, in particular. The Royal Society for the Conservation of Nature reports that most of its work is done independently and without government funding, forcing it to rely on financial support from NGOs and donors. The Jordan Tourism Board could do more to promote protected areas and natural treasures, which would support local communities and expand grassroots livelihood opportunities.

All the projects managed by the Royal Society for the Conservation of Nature target local job creation in the communities in which they work, ranging from tourism-centred roles to crossover employment in sectors such as organic farming and solid waste management. It runs integrated programmes that connect ecotourism, agriculture and environmental education and environmental awareness sessions, which, in turn, promote other eco-businesses and support the transition towards green agriculture.

Skills gaps

Being a service sector, tourism depends on well-trained and educated individuals who deliver a competitive advantage within the industry and ensure business profitability. According to USAID, the sector generated 96,950 jobs in Jordan in 2019, a figure which fell to 52,491 in 2020 as a result of the pandemic. The sector has since recovered, generating over 79,500 jobs in 2021.⁵⁵ Accommodation, food and beverages and land and sea passenger services were the biggest single-field employers, although travel agencies, air passenger services and entertainment accounted for more than 3,000 jobs each.⁵⁶ This rapid recovery of the sector is expected to continue as the global pandemic subsides and consumer travel patterns return to normal.

The Green Growth National Action Plan sets a target to increase the number of qualified employees in the sector by 40 per cent,⁵⁷ which will be delivered through the establishment of a Tourism Sector Training Centre of Excellence. To promote ecotourism, a skilled workforce in

⁵⁵ Hyasat and others. 'Training needs assessment for small businesses: the case for the hospitality industry in Jordan', p. 22. (2022)

⁵⁶ Hyasat and others. (2022), p.22.

⁵⁷ Ministry of Environment. *Green Growth National Action Plan 2021-2025: Tourism Sector*, p.12. (2020)

specific occupations will be required, including ecotour guides with understanding of the heritage and ecological and environmental landscape, park rangers, conservationists, green facilities managers, branding specialists, and waste management and ecotour operators with sufficient knowledge to deliver the customer experience. Many tourism-specific training courses will need to integrate ecotourism modules to expand the employment possibilities of graduates and reduce the skills mismatch in the market.

The current skills supply is inadequate and fails to meet demand, including for soft skills. Communication and marketing skills, including English language proficiency and social media and digital marketing skills are essential, alongside other soft skills such as customer relations. This expertise is also required in tourism marketing and travel agencies, while product design skills should be accompanied by improved understanding of the ecological context within which their offer can be framed.

The Ministry of Tourism and Antiquities echoed the importance of these skills and added that product development was of equal importance because of the need to constantly refresh the offer, to ensure repeat visits by both domestic and international tourists.

In addition, there is a crossover between this sector and the ICT, renewable energy and waste management sectors. Digital skills would enable providers to reach new audiences through digital marketing, increase revenue and bookings through e-commerce solutions and support the development of the Jordan Digital Map of all the tourism sites, which the Jordan Tourism Board is currently developing. Renewable energy and waste management are integral parts of ecotourism in that they reduce its carbon footprint, so the sector also offers employment possibilities to people with the relevant skills. As yet, however, no assessment of skills gaps and shortages in the ecotourism subsector has been carried out.

Luminus has begun to integrate ecotourism as a module within its wider tourism and hospitality courses. In 2021-22, 1,217 individuals participated in its hospitality and tourism courses, more than in courses related to any other sector relevant to this report, which demonstrates the demand at both the employer and the student levels.

The Jordan Restaurant Association described the tourism sector as characterized by high turnover of staff and lack of coherent career progression or training development pathways.⁵⁸ This situation is exacerbated by the fact that the sector consists mainly of small, family-run businesses that lack the organizational structure for career development through the workplace experience. Much of the work is seasonal or informal, which is why a move towards a standardized, structured offer as attractive to locals as it is to international tourists is so essential.

2.4. Water management

Jordan is one of the most water-poor countries in the world. Population growth, urbanization and the greater use of irrigation in farming have led to a constant growth in demand for water resources, while climate change is expected to further exacerbate water scarcity. The refugee

⁵⁸ RYSE. *Employment and market systems assessment in Jordan*, p.9. (2021)

crisis has placed tremendous additional pressure on public services and infrastructure, particularly the electricity and water sectors, adding to long-standing structural challenges related to security of supply and efficiency and has brought the already inadequate infrastructure to the limits of its capacity.

The need to improve the availability and sustainable management of water and wastewater emphasized by the Ministry of Water and Irrigation in the National Water Strategy 2016–2025, has led to investment in and expansion of the sector and is driving employment creation, particularly in water management, construction and infrastructure maintenance, as well as water supply and sanitation.

To create an enabling environment that maximizes the value of one of the country's most precious resources, the Green Growth National Action Plan for Water sets out several essential policy and institutional reform actions. They are designed to attract inbound investment by removing policy barriers and capacity gaps, which in turn both de-risk the sector and reduce costs. So far, government policy has focused on large infrastructure projects and paid little attention to opportunities for employment creation. The current National Water Strategy 2016–2025 and the Water Sector Capital Investment Plan have set the goal of speeding up national efforts to manage water and recognize the need for critical reforms and a shift towards more sustainable water planning, allocation and demand management. The green growth approach promotes testing and innovation and market-based or decentralized approaches to creating opportunities from these challenges, including green jobs, improved financial sustainability in the sector, and resilience to climate change. The performance of the water sector also has knock-on effects on other sectors, and vice versa. For example, reduced energy consumption in part depends on efficiencies in pumping water and water-efficient technologies on farms and the installation of water-harvesting at scale, if done in an ecologically sustainable manner, can reduce the pressure on water networks.

As is a recurring theme in this report, skills and training were not fully considered during the Green Growth National Action Plan review of the water sector, despite the significant numbers of people already employed directly or indirectly in the sector. It is hoped that the proposed training needs assessment underway at the time of report development, will establish the technical skills gap and how local capacity could be improved.⁵⁹

Skills gaps

The skills mismatch and lack of alignment between training provision and the needs of the labour market mean that employment prospects are limited in a sector that is otherwise growing. According to WE Skill, the National Skills Council for Water and Energy, there are many job vacancies in the sector, which continues to lack skilled personnel at both major infrastructure and household levels. The skills gap is clear: the lack of qualified plumbers, water distribution operators, wastewater treatment specialists and water engineers has resulted in poorly installed and poorly maintained household water infrastructure, which in turn leads to water being wasted and increased costs for households. This skills gap in an area where long-

⁵⁹ Ministry of Environment. *Green Growth National Action Plan 2021-2025: Tourism Sector*, p.35. (2020)

term, demand is assured is an opportunity for livelihood generation in the construction, maintenance and wider water supply chain.

The sector has attracted support for training and livelihood generation, including through the formal education system and with support from the international donor community. The Al-Balqa Applied University is the lead body for technical training in the sector, conducting both domestic and international training courses on water treatment and sanitation and wastewater treatment techniques aimed at the staff and operators of water utility companies in Jordan. Alongside their own courses, the University works with the International Research Center for Water, Environment and Energy (IRCWEE) and collaborates with IHE Delft Institute for Water Education and the World Water Academy on the WATRA Project, which delivers training to strengthen skills development for wastewater treatment and reuse in agriculture as part of a recently established higher technical and vocational education and training programme.⁶⁰

Additional training is provided through the Water Training Centre in Amman, which reopened in 2021 and offers theoretical and practical water management training to both Jordanian and regional specialists and water sector workers. It seeks to provide specific administrative and technical water training programmes, which introduce modern, digitized technology.

International donors have also implemented small-scale pilot programmes to test the validity of the sector from a job creation perspective. GIZ, the German overseas aid agency, has been active for some time, having initially run a 'Support for Jordanian Communities in Response to the Syrian Refugee Crisis through Water Wise Plumbers' scheme, which trained over 200 plumbers in Jordan and created cooperatives of female plumbers, both Jordanian and Syrian, in Irbid and Amman.

Between 2017-2020, GIZ ran a follow-up scheme, 'Vocational Training and Skill Enhancement for Jordanians and Syrian Refugees in the Water Sector (VTW)', which established technical and vocational education and training programmes related to the water sector for Jordanians and Syrian refugees. The success of this project and the demonstrated employability of its beneficiaries could provide evidence that livelihood generation through training in this sector is viable, even if central Government investment fails to materialize.

Even in a sector as specialized as water management, soft skills were referenced as among the most important and valued in the labour market. The Association for Energy, Water and Environment stated that trainees needed to be proficient in English, digitally literate and have good presentation skills.

2.5. Information and communications technology

The ICT sector is one the most rapidly growing sectors of the Jordanian economy; it has an annual revenue that exceeds US\$2.3 billion and is considered by the US Department of Commerce as a 'best prospect industry sector' for Jordan.⁶¹ The sector saw growth of over 6 per

⁶⁰ *Jordan Times*. 'Al Balqa Applied University concludes training on wastewater treatment techniques'. (2022)

⁶¹ International Trade Administration. *Jordan – Country Commercial Guide*. (2021)

cent during the pandemic and is a hotbed of entrepreneurship, with over 900 active companies employing over 22,000 people.⁶²

It is important to note that more than 95 per cent of Jordanian ICT companies are small and medium-sized enterprises, most having between 20 and 50 employees.⁶³ This demonstrates that, while Jordan is a fertile environment in which such companies can be founded and grow to a certain extent, these businesses face significant challenges in scaling up further. Most founders of such companies come from a technical background as opposed to a business background and this is often reflected in a focus on serving a small number of customers, rather than striving to open up new local and international markets.⁶⁴ It is quite common to see businesses in the sector quickly reach a certain level and then remain at that size.

Growth is possible, but greater understanding is needed of organizational capability, as is government support for international growth and export of services. The Government needs to provide business development support to these companies to allow them to open up new markets and connect to a wider network of international tech companies that could be offered outsourcing opportunities.

The Economic Modernization Vision acknowledges that *'overregulation can impede development in Digital Economy and technology-enabled sectors'*. To address this, the Economic Modernization Vision calls for the establishment of a new regulatory framework for disruptive technologies and the establishment of a new legal framework for new companies and technologies, which is *'agile and responsive to facilitate and ease starting new tech companies / scaleups / potential unicorns'*.⁶⁵

Subsectors

Subsectors include computer engineering, software engineering, app development and mobile solutions, digital and graphic design, business process outsourcing and computer and hardware maintenance. Vertical subsectors, including fin-tech, ed-tech and health-tech, are also notable. There is also an emerging market around the 'Arabization' of digital content, which opens Jordan up as a service provider for a regional marketplace.

The most prominent of several key subsectors is business process outsourcing. It is important to note that this encompasses far more than call centres and other support services, also including the outsourcing of all technical and digital support services: writing, editing, translation, social media management, graphic design, web design, software development, videography and other associated services. This boom in the creative industries creates opportunities as part of the evolution of the wider labour market after the pandemic, which increased the emphasis on flexible and home-based working and the emergence of a 'gig economy' based on skilled freelance service provision.

⁶² International Trade Administration (2021)

⁶³ Assessment provided by Int@J during stakeholder interviews.

⁶⁴ Assessment provided by Int@J during stakeholder interviews.

⁶⁵ *Economic Modernization Vision*, p. 57. (2022)

It should be noted that ICT is a 'closed sector' in Jordan, meaning that only Jordanians can work as developers, for example. This restricts the ability of refugees to engage in the labour market, even if they have the required skillsets, and deprives Jordanian businesses of the external expertise they require. Informality, which creates decent work deficiencies, is another key characteristic of the sector.

Furthermore, geographic constraints hamper the mobility of labour. Many of the universities offering relevant courses are situated outside Amman and the cost implications and cultural stigma, especially for female graduates, of moving to Amman for work, have made it difficult for graduates to gain employment.

Investing in the 'gig economy' with opportunities for remote working, would help to mitigate these issues and open up the sector to individuals and communities outside urban centres.

Employment landscape

The Jordanian Government has acknowledged the importance of the ICT sector to the nation's economic growth and has begun taking steps to incubate it. It is aware of the strategic opportunity the sector offers Jordan, considering its geographically strategic location at the crossroads of Europe and Asia, its young and digitally savvy population and its free trade agreements offering access to over 1.5 billion customers in 161 countries.⁶⁶

The National Digital Transformation Strategy and Implementation Plan 2021–25 aims to enhance the digitization of government services, improve connectivity and create at least 50,000 direct jobs in the digital sector by 2025.⁶⁷ Jordan attracted US\$1.1 billion of announced cross-border greenfield foreign direct investment in ICT between 2010 and the first half of 2021. The current REACH2025 Initiative launched in 2016 aims to increase the revenue of the digital economy by between 25 and 30 per cent, creating 130,000 to 150,000 jobs and between 5,000 and 7,000 new businesses by 2025.

In 2021, the Ministry of Digital Economy and Entrepreneurship launched Jordan Source, a tool to facilitate and expedite investment in Jordan's digital outsourcing economy. The programme, run in partnership with the World Bank, seeks to capitalize on the fact that more than 22 per cent of new Jordanian graduates hold degrees in information technology, computer science or engineering.

More broadly, the Ministry is aggressively targeting inbound ICT investment, with dedicated online platforms seeking to stimulate sector growth. According to key statistics for 2018 highlighted on the Ministry's website, the sector was worth over US\$2.3 billion per annum and was growing at a rate of 5 per cent annually. It accounted for 22,416 jobs that year, 33 per cent of workers being female.⁶⁸

⁶⁶ Ministry of Digital Economy and Entrepreneurship. 'Press release: Jordan's ICT sector set to grow owing to strong human capital and infrastructure'. (2021)

⁶⁷ OECD and EU. Promoting investment and business climate reforms in Jordan's ICT sector Issues paper for a public-private dialogue. (2022)

⁶⁸ Ministry of Digital Economy and Entrepreneurship website.

International blue-chip companies such as Amazon, Microsoft and Aspire have recently invested in Jordan, capitalizing on this pro-business stance, which has resulted in a burgeoning of rapidly expanding domestic companies. For example, Amazon has reportedly positioned Jordan as its regional hub and doubled its workforce in the country since 2017, with over 1,200 staff in-country. It is planning a further increase to 2,300 in-country staff in the next couple of years.⁶⁹ Despite overall sectoral growth, however, company representatives themselves feel that the sector is not developing as it should.

The concentration of ICT companies in Amman, with only a handful in Irbid and very few in the south of the country and the industrial zones, has also resulted in geographic disparity, which makes sectoral employment challenging.

Online and remote work, which to a large extent began during the pandemic, offer real opportunities for young and digitally literate Jordanians wherever they are located, especially in the business outsourcing sector. This goes further than the typically envisioned remits, such as call centre operations, and allows Jordanians to embrace the global trend towards freelance working and 'gig economy' opportunities in the ICT sector.

To this end, Youth Technology and Jobs, a joint initiative of the Ministry of Digital Economy and Entrepreneurship and the World Bank, seeks to identify and establish working hubs outside Amman that can encourage the gig economy, freelancing, part-time work and remote working in general. This US\$200 million project will run until 2025 and seeks to deliver jobs for 10,000 young people, including 3,000 women and 1,500 Syrians, providing them with training in 'employable digital skills', which will lead to new income generation opportunities. Alongside training, the project seeks to expand market access for digital firms and provide incentives for business growth and subsequent employment. These initiatives need to be accompanied by legislation to ensure that 'gig work' is decent work and gives workers in this sector the protection and rights they need to thrive.

Skills gaps

Int@j, the advocacy organization for the ICT sector, reports that between 4,000 and 7,000 individuals graduate from a university or other higher education institution with an ICT-related degree each year, of whom approximately 50 per cent are female, representing a gender balance in this sector. Of these, only 35 per cent gain employment in the sector in Jordan within a year, for a multitude of reasons.⁷⁰

The market demand for ICT professionals in Jordan continues to grow, but skills shortages persist. Most ICT graduates lack the skills required to transition into the labour market, including soft skills, such as leadership, communication and proficiency in English, as well as hard technical skills and experience using cutting-edge software.

⁶⁹ Ministry of Digital Economy and Entrepreneurship website.

⁷⁰ Assessment provided by Int@j during stakeholder interviews

Representatives of the private sector believe that curricula and skills training in the sector need to be aligned with industry requirements and that the Government should allow flexibility so that curricula can be updated in line with market trends and developments.

To determine the skillsets required and where they are lacking, it is important to profile the state of the labour market. In 2022, Int@j will publish their latest skills gaps and labour market assessment, which will add useful context but, in the interim, the greatest demand is for people with software skills: coders, web designers, app developers, computer programmers, software developers, graphic designers and videographers, as well as data processors and analysts. Outsourced services such as telecommunications services will continue to be in demand.

Int@j reports, however, that the skill most in demand that new graduates lack is adaptability to new software and an aptitude for learning new approaches. Unlike 'technical skills', this is related to the culture of education and training, the exposure of students to different situations and software and the ability to transfer skills learned in one format to applications in new scenarios. According to stakeholders, curricula and learning materials often look good on paper but there are shortcomings in the delivery of education and training.

Moreover, technical universities and technical and vocational education and training providers often rely on outdated hardware for their teaching and continue to teach software and programming languages that have been replaced by newer alternatives by the private sector. Basic coding is still taught, but lack of exposure to new and innovative technology makes it difficult for students to benefit from their education in practical terms, limiting their employability.

To sum up, university curricula are unable to keep pace with changing trends in the sector, which has meant that companies themselves have taken on the burden of ensuring that graduates are qualified to work with the newest technologies. This results in a time and resource commitment that some companies are reluctant to make, especially when faced with the risk of losing staff to offers from the Gulf once they have received training.⁷¹ As a result, as many as 29 per cent of companies do not provide in-house training,⁷² which means that individuals have become responsible for preparing themselves for the workplace. Overall, stakeholders estimated that as few as 10 per cent of Jordanian ICT graduates are 'market-ready', leaving the private sector carrying the burden of providing supplementary training.

The failure of both Government and employers to provide appropriate skills programmes means that the costs of skills development are offloaded onto workers, who invariably have to turn to more expensive training providers in the private sector.

The ICT Sector Skills Council is in place, but both the private sector and skills council representatives have conceded that, all the time skills councils have only a consultative function, their influence on curricula and subsequent employment outcomes will remain limited.

⁷¹ Int@j. *Labour Market Study*, p. 20. (2016)

⁷² Int@j. *Labour Market Study*, p. 22. (2016)

Initiatives to address skills shortages

The ICT Sector Skills Council has recently established a Digiskills platform to help bridge the gap between graduates and labour market needs. After a transitional period, a new management board for Digiskills is now in place and prepared to work with the Government to implement its initiatives. This is the first Government-funded practical step towards strengthening the role of a sector skills council in reducing a skills mismatch. There are, however, concerns that this funding could be repurposed by the Government, as there is a perception that the relevant ministries are unwilling to dedicate resources to skills provision in the sector.

Some private sector training providers have stepped in to try to fill skills gaps, but the offer remains limited. Luminus offers paid programmes, companies themselves offer training to staff, and corporations such as Orange offer free coding training courses, but the capacity of these courses is limited.

The Government and the voluntary sector are trying to facilitate access to these opportunities. To help build on the existing training landscape, the Ministry of Youth has now included digital skills training programmes in its offer to help young people develop the required digital skills ahead of employment.

Similarly, with funds from Orange, JOHUD, the Hashemite Fund for Human Development has launched a series of women's digital centres, most of them outside Amman, and they have been expanding into business centres. There are currently eight such centres, focusing on providing women with digital skills that support them in both household management and small business development and employability. The structured curriculum offers technical and soft skills and graduates are provided with employment and funding opportunities through Orange.

Another significant initiative is the 'One Million Jordanian Coders' initiative implemented by the Crown Prince Foundation, alongside the Ministry of Digital Economy and Entrepreneurship and the Ministry of Cabinet Affairs of the United Arab Emirates. The programme seeks to develop an online platform that equips Jordanian youth with effective coding skills and provides international certification that qualifies graduates to enter the labour market. It was launched in May 2019 and, as of September 2021, 30,000 individuals had participated in it. This represents a degree of progress, but much remains to be done.

► Recommendations

Improve skills governance and increase investment in competency-based training and related skills infrastructure to meet skills needs for green growth and a digitally-enabled economy

Across all sectors covered by this report, educational and training outcomes lack alignment with the market needs of the industries and enterprises supporting green and digital transition. Most stakeholders consulted expressed this concern about the overall direction of investment in market-relevant skills training and upgrading the skills system. To address this issue, a series of skills reform initiatives have been taken in the form of legislative changes, structured engagement of the private sector through sector skills councils, new competency-based training programmes and setting up the Technical and Vocational Skills Development Commission to bring about a unified governance structure. These are steps in the right direction.

Technical and vocational education and training authorities have yet to establish a system to periodically assess the skills needs of the market in order to inform skills delivery. In the absence of legislative reform to address the issue of private sector participation in skills governance, the sector skills councils have yet to play an active role in the skills delivery cycle. With ILO support, this governance issue is being resolved through legislative reform undertaken by the Government.

Recommendations

- 1.** The Technical and Vocational Skills Development Commission should introduce training for the occupations that are in demand in industries facilitating green and digital transition. Acting swiftly will enable curricula to incorporate and build on the specific needs of emerging and evolving sectors, including future green technology, such as electric vehicles, solar panels, smart meters and biofarming, so that they can be mainstreamed in teaching.
- 2.** As emerging green sectors evolve, generate employment and are integrated into education and training, employers' needs must be understood and underscored to ensure that Jordanian youth are adequately skilled in key areas and are able seamlessly to enter the workforce.
- 3.** Furthermore, as training programmes are developed and accredited, the lack of soft skill training among new graduates and trained individuals should be addressed in order to improve their employability. Training programmes aimed at producing the leadership skills, communications skills, digital literacy, capacity for innovation, adaptability and language proficiency required by the occupations in demand should be embedded in broad and specialized curricula.

Create awareness of the circular economy and green transition

Stakeholders reported that public awareness of the circular economy and the economic and environmental benefits it provides remains low. The Jordan Strategy Forum, which supported the drafting of the new Economic Modernization Vision, reports that public awareness of the need to promote demand for green products and for environmental protection is low, so research and awareness-raising efforts need to be stepped up. This shift would in turn stimulate sufficient demand to invigorate the subsectors currently considered insufficiently mature.

Recommendations

1. The opportunities delivered by the green transition should be highlighted and awareness enhanced among both industry and the public. Government and civil society should play key roles through strong evidence-based advocacy.
2. This process should start with better education in schools and engagement with community-based organizations and educational institutions, and should cascade down from Government, through municipalities and into communities, to deliver the best results.

Address geographic disparity in terms of creating business opportunities, access to skills and equity

Industry, institutions and the skilled workforce are mainly concentrated in Amman and other big cities. Industrial zones still face challenges resulting from lack of staff and an unwillingness of people to relocate to work in them and are therefore largely reliant on foreign workers, which limits employment possibilities for Jordanian youth.

Recommendations

1. Geographic considerations need to be taken into account when planning where to locate industries and services and upgrading education and training centres. The skills of local populations need to be leveraged and their needs tackled to bring about long-term sustainability and maximum social impact.
2. The emergence of remote working, the 'gig economy' and new sectors relevant to rural contexts will help to mitigate issues of geographic disparity. These phenomena should be supported through the formalization of social security and taxation structures for people working in this way. Investment is also needed in the development of rural business hubs.

Ensure effective targeted employment generation

To bring about the transition to a digitally-enabled economy, greater clarity is needed on targeted employment generation strategies in the sectors leading green growth. Many announcements and strategies have sought to reposition the Jordanian economy as a service provider, outsourcing hub, energy exporter, tourism hub, industrial and manufacturing capital but the necessary focus on creating a skilled workforce and upgrading education and skills ecosystem is missing. The Green Growth National Action Plan tends to refer to employment and livelihoods with little strategic focus on how it can be delivered.

Recommendations

1. Sector-specific targeted employment strategies with clear employment and job creation targets, along with an assessment of the skilled workforce needed for different occupations in the priority sectors, would clarify skills investment requirements and employment projections and would promote evidence-driven interventions
2. Where government or overseas development assistance funding or investment is allocated to manufacturing projects, a commitment to the greening of the factories and other elements of the venture would help stimulate the development of the circular economy and promote green jobs.

Promote and assist entrepreneurship with business development services in green and digital sectors

The Government of Jordan places a high value on entrepreneurship across all sectors, and there is considerable potential to deliver further interventions that promote entrepreneurship and digitization of small and medium-sized enterprises in the sectors under discussion.

Recommendations

1. Integration of entrepreneurship education in technical and vocational education and training and technical colleges would open more career paths for graduates.
2. The entrepreneurship ecosystem needs to be strengthened through structured entrepreneurship training, expanding start-up programmes and incubation, improving financial inclusion and providing other business development support services, in partnership with employers' associations.
3. Digitize small and medium-sized enterprises.

SECTOR-SPECIFIC CONCLUSIONS AND RECOMMENDATIONS

Sustainable agriculture/Biofarming

The sector is promising from a green jobs perspective, specifically as regards aquaponic and hydroponic farming, land management, fertilizer production and distribution and water management. The high input costs associated with some elements of hydroponics and other new technologies have created constraints.

The agricultural sector is held back by a misalignment between the needs of the market and the products grown by Jordanian farmers. Farmers still misunderstand the needs of industry, and this forces manufacturers to import, instead of using locally grown products.

Recommendations

1. **Mapping:** It is important to map the existing biofarming sector and the wider value chain associated with it to determine the size and prospective growth of the green sector and the extent of market demand for new skills.
2. **Skills needs:** Training in hydroponics, aquaponics and other areas of biofarming should follow a standardized protocol, built around a 'smart agriculture' model. An understanding of the concept of green agriculture and how it is applied to farming would enable solutions

to be found. Those solutions would concern the types of crops that will be successful, the right choice of green fertilizer, effective resource and water management, how to tackle infestations and the harvesting process. This needs to be accompanied by marketing and branding support.

- 3. Market awareness:** Young people entering the sector require a strong understanding of what products are in demand so that they are able to grow produce that can be purchased and absorbed into both the primary and the food-processing markets. By better understanding what products command market value, farmers will be able to invest in new and emerging technology with greater confidence of successful outcomes.

Renewable energy

The current, favourable investment landscape and government policy on the rollout of smart meters and solar panels make grid maintenance and the installation of smart meters, and the solar and photovoltaics subsector the two most viable subsectors for the development of green livelihoods, but both come with significant skills challenges.

Recommendations

- 1. Workforce assessment:** An assessment of the size of workforce required to support the rollout of the subsectors must be conducted to determine the requirements for each occupation and the technical skills and competencies required to support the installation and maintenance of approved technology within its technical specifications.
- 2. Amended curricula:** Curricula need to be adjusted to ensure that practical applications are taught, not only theoretically in the classroom, but also through hands-on training. The Jordan Chamber of Industry and the Jordan Engineers Association are working with the Technical and Vocational Skills Development Commission and the sector skills councils to close skills gaps and are advocating for active private sector engagement to align educational outcomes with labour market needs.
- 3. Seasonality of labour:** The short-term nature of the current opportunities due to one-off installation and seasonal weather patterns means that these opportunities are not yet mature enough to deliver secure, full-time employment. Specialized training in solar and photovoltaics should therefore be accompanied by wider but relevant training in electrical engineering, installation and maintenance to enable individuals to work in less specialized fields and augment their livelihoods until such time as demand warrants and delivers full-time employment.

E-mobility

This is a new technology requiring both the training of new mechanics and engineers and the upskilling of the existing labour force.

Recommendations

- 1. Government policy:** Government policy on the importation, customs clearance and taxation of electric vehicles needs to be consistent to provide the necessary confidence for continued growth in the sector and to provide the guarantees needed by education and training providers to introduce electric vehicle training in their curricula.

- 2. Skills development:** As this technology is still quite new and demand is growing exponentially, the Technical and Vocational Skills Development Commission and technical universities must act rapidly to establish accredited training and liaise with the private sector to ensure that newly introduced curricula are in line with market needs.
- 3. Hybrid training:** As with training in solar and photovoltaic technology, hybrid training should be offered to allow graduates and trained individuals to access a broader pool of opportunities until such time as the sector matures sufficiently to support secure, full-time employment. Equipping engineers and mechanics to service, maintain and safety-check both electric and combustion engine vehicles would enable them to secure short-term employment and transition their livelihood in line with the transition of the automotive sector.

Ecotourism

Ecotourism was a priority for most stakeholders and the Economic Modernization Vision's calls for 99,000 new tourism jobs by 2030, but specific figures for ecotourism employment are lacking.

Recommendations

- 1. Clearer direction on jobs in ecotourism:** The greening of existing tourism facilities and operations is urgently needed. While the Economic Modernization Vision estimates that the sector can generate 99,000 new jobs, more in-depth assessment is needed to estimate job creation in ecotourism and how the target can be reached in view of the skilled workforce needed for this sector.
- 2. Develop training foundations:** The Ministry of Tourism and Antiquities, the Technical and Vocational Skills Development Commission and the private sector should work together to develop a sector skills council for the ecotourism sector, grounded in the delivery of the Government's ambitions for tourism sector jobs.
- 3. Shift the focus of training:** Integrating an ecotourism module into existing training courses and introducing specific courses on ecotourism are two clear directions for creating a skilled workforce and upskilling the exiting workforce. An increased focus on product development is also necessary to enable the sector to remain internationally competitive.
- 4. Digitize the sector:** The need to support the digital transition of the tourism and ecotourism sector was referenced by both the Government and the private sector and is a rare crossover between the green and ICT components of this research. Alongside government initiatives to embed digital elements of the tourism offer, it is important that tourism training includes a digital component that enables students to develop essential digital marketing, social media and content creation skills to unlock new marketing opportunities both locally and internationally.

- 5. Constant renewal:** If the sector is to continue to grow, repeat travel and tourism, by both local and international visitors, needs to be encouraged. To deliver this, product offers must be continually expanded and renewed to keep up with demand, so the importance of product development within the sector must be embedded in training and academic education.

Information and Communications Technology

The ICT sector in Jordan remains a high priority for the Government and has shown consistent growth in recent years. It offers significant potential for the creation of high-productivity jobs that could help absorb a proportion of educated youth, while helping to diversify the national economy.

Recommendations

- 1. Regulatory reform to bring about stability and thus attract investment:** Regulation of and legislation on the sector need to be made flexible to attract more foreign investment. Stable regulation is essential to provide certainty. At present, constant legislative and regulatory change discourages investment. The Government needs to adopt a coherent and consistent approach to the sector.
- 2. Regulatory reform to promote the 'gig economy':** Changes are required to the regulatory framework, which currently does not define work of this nature, making it difficult to register for social security or handle taxation. Taxation arrangements for freelancers and digital staff remain opaque. Regulations need to be streamlined and simplified to allow these subsectors to grow and thrive and provide workers with the confidence to take these opportunities in the knowledge that they are doing so in a tax-compliant manner and without losing access to social security or protection.
- 3. Strengthen the Sector Skills Council and see that it is engaged in skills governance and skills delivery:** The ICT Sector Skills Council's Digiskills platform needs to be made sustainable and the roll of the Council strengthened in relation to skills governance, skills needs' assessment, curriculum development, skills certification and job placement. Future developments in this area must seek to ensure cross-compatibility with this and any other existing platforms to ensure cumulative and continuous progress.

► References

- Abu Sae'a, A, J. Fuentes Bargues and P. Ferrer Gisbert. 2020. 'Analysis of the Jordanian construction sector', *24th International Congress on Project Management and Engineering*.
- Al-Gurg, T. 2018. *Technical and Vocational Education and Training is essential to the sustainable development, growth and advancement of nations*. Published by Mohammed bin Rashid Al Maktoum Global Initiatives.
- Assaad, R., C. Kraft and M. Sieverding. 2021. *Barriers to Economic Participation for Young People in Jordan: A Gendered Analysis*.
- British Council. 2021. *Preparing Work-Ready Graduates for Employment in Jordan*.
- Cote, S. 2019. *Renewable Energy and Employment: The Experience of Egypt, Jordan and Morocco*
- Dahiyat, I. 2020. *Sustaining Jordan's Water Sector*.
- EU-OECD Programme on Investment in the Mediterranean. 2022. *Promoting investment and business climate reforms in Jordan's ICT sector*. Issues paper for a public-private dialogue.
- European Bank for Reconstruction and Development. 2020. *Jordan Diagnostic 2020*.
- Energiepartnerschaft. n.d. The Jordanian-German Energy partnership. 'The just transition: building up capacities to carry out the energy transition'.
- Friedrich Ebert Stiftung. 2019. *Recommendations on E-mobility in Jordan. Based on a delegation trip to Germany*. Regional Project on Climate and Energy Policy.
- European Training Foundation. 2020. *Jordan: Education, training and employment developments*.
- _____. 2021a. *National Qualifications Framework – Jordan*.
- _____. 2021b. *Policies for Human Capital Development: Jordan*.
- Government of Jordan. 2022. Economic Modernization Vision.
- _____. 2016a. National Strategy for Human Resource Development.
- _____. 2016b. National Strategy for Sustainable Consumption and Production.
- Global Green Growth Institute. 2020. *Report: Jordan Green Growth National Action Plans 2021–2025: Transport Sector*.
- Harvard University Center for International Development. 2019. *Female Labor in Jordan*.
- Huang, C. and K. Gough. 2019. 'The Jordan Compact: Three years on, where do we stand?', *Relief Web*.
- Hyasat, A., G. Al-Weshah and D. Kakeesh. 2022. 'Training needs assessment for small businesses: the case for the hospitality industry in Jordan'. *GeoJournal of Tourism and Geosites* 40(1), 20-29.
- Int@j. 2016. *Labor Market Study: fresh graduate employment in the ICT sector of Jordan*.
- International Catholic Migration Commission. 2021. *Refugees in host communities seeking direction from the margin of Jordan's labour market: labour market assessment*.
- International Labour Organization 2021. *Impact of work permits on decent work for Syrians in Jordan*.
- _____. 2022. *ILO Prospects at a Glance*, passim.
- _____. 2021. *Jordan – Country Commercial Guide*.
- _____. 2015. *Manual on Skills Testing and Certification: Jordan*.
- _____. 2020. *State of Skills: Jordan*.
- International Renewable Energy Agency and International Labour Organization. 2021. *Renewable Energy and Jobs. Annual Review 2021*.
- Jacques Delors Institute. 2020. *How to Green Trade Deals*.

Jordan Times. 2022a. 'Al Balqa Applied University concludes training on wastewater treatment techniques'.

_____. 2022b. High fuel prices accelerate demand for electric cars, says stakeholder. (2022)

Ministry of Digital Economy and Entrepreneurship. 2021. 'Press release: Jordan's ICT sector set to grow owing to strong human capital and infrastructure'

Ministry of Environment. 2017. *A National Green Growth Plan for Jordan*.

_____. 2020a. *Green Growth National Action Plan 2021-2025: Agriculture Sector*.

_____. 2020b. *Green Growth National Action Plan 2021-2025: Energy Sector*.

_____. 2020c. *Green Growth National Action Plan 2021-2025: Tourism Sector*.

_____. 2020d. *Green Growth National Action Plan 2021-2025: Transport Sector*.

_____. 2020e. *Green Growth National Action Plan 2021-2025: Waste Sector*.

Ministry of Tourism and Antiquities. 2021. *Jordan National Tourism Strategy*.

Moens, B. and J. Hanke Vela. (2022). 'Brussels says it's serious about green trade deals', published in *Politico*.

Organisation for Economic Cooperation and Development. 2010. *Learning for Jobs*.

Organisation for Economic Cooperation and Development and European Union. 2022. Promoting investment and business climate reforms in Jordan's ICT sector Issues paper for a public-private dialogue. EU-OECD programme on Investment in the Mediterranean.

Oxfam. 2022. *Uncovering the Potential: the role of informal actors in solid waste management in Jordan*.

Qudra2. 2020. *Skills needs analysis and mapping of private enterprises with employment and PPP potential*.

Res4Medi. 2019. *Scaling up renewable energy development in Jordan*.

RYSE. 2021. *Employment and market systems assessment in Jordan*.

Sixt, G and K. Poppe. 2019. *The agricultural knowledge and innovation system of Jordan's horticultural sector*.

Sullivan, Kathy. 2013. "Jordan's Natural Bounty Becomes a Boon for Locals and Tourists". *Frontlines*, November/December 2013 USAID.

United Kingdom Board of Trade. 2021. *Green Trade: A Board of Trade Report*.

UNESCO Institute of Statistics Website.

United Nations Jordan. 2020. *Meta-analysis on women's participation in the labour force in Jordan*.

Winkler, H. and A. Gonzalez. 2019. 'Jobs Diagnostic Jordan'. *World Bank Group Jobs Series (18)*.

World Food Programme. 2022. Jordan Website.

► Annexes

Annex I: List of stakeholders consulted

MINISTRIES AND GOVERNMENT AGENCIES		
Ministry of Labour	Manar Hirzallah	Director
Ministry of Industry, Trade and Supply	Iyas Murad	Director
Ministry of Tourism	Emad Hejazeen	Secretary General
Ministry of Digital Economy and Entrepreneurship	Amira Qarqash	Director – Global Skills
Ministry of Energy and Mineral Resources	Yara Nemri	Director
	Yacoub Marar	Head of Renewable Energy Department
Ministry of Planning and International Cooperation	Bahjat Aulimat	
Ministry of Youth	Dina Batayneh	Minister's Office
	Hasan Khawaj	Director of International Cooperation
	Fakhri Altwal	Minister's Office
Cities and Villages Development Bank	Osama Alazzam	CEO
National Agriculture Research Centre	Nizar Haddad	Director
	Ala'a Wahbeh	Green specialist
Amman Vision	Ala'a Beano	CIO
Jordan Hashemite Fund for Human Development	Dina Alaeddin	Senior Project Manager
	Iman Al-Hindawi	
SPECIALIST AND ADVOCACY ORGANIZATIONS		
EDAMA Association for Energy, Water and Environment	Anwar Elhalah	General Manager
	Noor Eldin Alkiswani	Policy and Research Analyst
Jordan Chamber of Industry	Maen Ayasrah	Head of Energy and Environment
	Dr Waseem Haddad	
	Obaida Abueid	
Jordan Cooperatives Corporation	Abdelfattah Al-Shalaby	General Manager
	Four focus group participants	
Union of Farmers	Mahmoud Aloran	Chairman
Int@j	Ayad Ashram	Programmes Manager
Injaz	Deema Bibi	CEO
	Safa Hijazeen	Executive Director
Jordan Strategy Forum	Nisreen Barakat	CEO
Jordan Center for Strategic Studies	Waleed Alkhateb	Head of Technical and Administrative Affairs
Royal Society for the Conservation of Nature	Othman Tawalbeh	Protected Areas Manager
Crown Prince Foundation	Ramsey Mansur	Research Manager
Dar Abu Abdullah	Zaid Qardan	Director
Jordan Engineers Association	Samer Al-Kilani	Director of Training Centre
	Heba Al-Abadi	Business Development
	Mahmoud Salama	Council member
ACADEMIA AND SKILLS DEVELOPMENT		
ICT Sector Skills Council	Dr Alaa Ensheiwat	Director
University of Jordan	Ahmad Awad	Director – Al-Faynaq Research Center
Al Balqa Applied University	3 representatives	
Technical and Vocational Skills Development Commission	Ayman Alwreikat	Manager of Accreditation and Quality Assurance

	Mohammad Nawiseh	Manager of Licensing
Salalem	Zaid Masri	Founder
Luminus Education	Amanda Kelleher	Director – International Education
INTERNATIONAL NGOs AND UN AGENCIES		
GIZ	Ulrich Thueer	Waste management lead
UNICEF	Abdulrahman Baroudi	
UN Women	Hazar Asfoura	Programme Analyst

Annex II: Thematic questions for desk review

DESK-TOP REVIEW – KEY QUESTIONS

Thematic area	Key questions	Validation
1. Existing labour market assessments / forecasts in key sectors	1. Have any labour market assessments and forecasts related to green and digital growth been conducted in the past three years? 2. Has any discernible growth been visible, either in overall sector growth, job creation, private investment or the provision of training? 3. What existing patterns or trends have been identified by the Government or development agencies that can inform the hypotheses? 4. How do non-Jordanians, including Syrian refugees, access the labour market and training opportunities, and what barriers do they face?	Emerging trends to be identified and embedded in data collection for validation purposes.
2. Government policy towards target sectors	1. Has the Government identified these sectors as potential growth markets? 2. Has the Government introduced policy/strategies directly related to said fields in the past three years? 3. How are the sectors reflected in Jordan's Green Growth Action Plans? 4. What future policy or strategy is being suggested which demonstrates a commitment to support these sectors? 5. What language is the Government using in relation to green and digital jobs to demonstrate public backing 6. How is the Government leveraging private sector capital investment to unlock job growth potential? 7. What work is the Government already doing to invest in training, educating and upskilling Jordanians in key emerging labour markets? 8. How does existing legislation and policy facilitate access to education or employment for non-Jordanians (Syrians, Egyptians, Yemenis)?	Interviews with ministers, government agencies and representatives to confirm policy position. Interviews with the private sector to validate how this has been delivered in practice and whether it has been effective.
3. Existing investment patterns	1. In which areas has private sector investment capital been focused in recent years and how does this interplay with green and digital growth? 2. Has international funding and investment (private sector and official development aid) been directed towards specific sectors? 3. Are international development agencies prioritizing sectors that align with the scope of this research? 4. How is the Government advocating, directing or matching resources against key sectors?	Validated through discussions with ministries, the private sector and development agencies.

	5. How does private sector investment appetite mirror growth and upskilling in key sectors? 6. How is training (both academic and technical and vocational education and training) being promoted by private sector investment	
4. Current training provision landscape	1. Which universities/institutes already offer qualifications related to the target fields? 2. What accreditation exists for target employment categories? 3. Who are the established providers of training/accreditation in target sector jobs? 4. What training provision gaps have already been identified? 5. Are training opportunities (academic and technical and vocational education and training) being made available to refugees and non-Jordanians?	Interviews and focus groups with industry, private sector personnel and academia.

Annex III: Questions for stakeholder interviews

AIM	SPECIFIC QUESTIONS	NOTES
QUESTIONS TO ALL PARTICIPANTS		
Introductory questions	• A series of introductory questions and remarks. • How did you come to your role? How long have you acted in that capacity?	To understand the individual's role, background and drivers.
Assessment of mood and optimism	• How do you feel about Jordan's potential to embrace change and transform into a green and digital economy? • Do you think the country has the right human resources and capital to catalyze this change? • What excites you about Jordan's potential for growth and development and what challenges do you foresee?	A more subjective, softer line of questioning designed to break barriers, relax participants and promote honesty.
QUESTIONS TO GOVERNMENT REPRESENTATIVES		
Policy	• Can you describe the position of 'Ministry X' on the specific sector? • How has the ministry prioritized this sector? How do you see it growing and how can you support this? • What specific policies has the ministry identified and delivered to promote sectoral growth? • How is the ministry looking to invest in human capital in the sector? • Does Jordan have the skilled people it needs to deliver this transformation? If so, how are they encouraged to remain in Jordan and, if not, what approach will the ministry take to change this? • How can the benefits of job creation and livelihood development be extended to refugee and migrant workers in Jordan?	These questions will be tailored to individual respondents, depending on the particular ministry.
Funding	• How has the ministry sought to stimulate private sector investment? • How does the ministry see its role in facilitating private sector growth and investment? • How will the ministry facilitate external investment into Jordan's economy and human capital?	
Partnership	• Does the ministry see potential in public-private partnership?	

	• Which private sector entities is the ministry engaging with to stimulate this transition? • Is the ministry partnering with particular education providers? • How does the ministry see the role of NGOs in supporting this transition?	
QUESTIONS TO PRIVATE SECTOR REPRESENTATIVES		
Investment	• How do you see the sector evolving over the next five and ten years? • Do you feel that the Government facilitates and provides the freedom for you to invest in the sector? • Do you believe that current government policy creates a conducive environment for the sector? • If you had one request of Government, what would it be? • Do you feel able and empowered to invest in digitization and futureproofing? • Are you supported in introducing international best practices, technology and innovation into the sector? • What barriers do you face from Government when making these decisions?	To be tailored to the specific business and sector.
Skills	• What particular skillsets do you look for in the current workforce? • What skillsets do you envisage your workforce needing in 5, 10 and 20 years? • Do you feel you have access to sufficient numbers of trained staff? • What key skills do you think are lacking in the sector and how can that be addressed? • What training and career development opportunities are you able to provide? • Do you feel that there is sufficient access to training opportunities for your staff? • Are current graduates leaving university with the skills they require for the jobs you recruit for? • Do you recruit non-Jordanian staff and, if so, how simple is that process?	
QUESTIONS TO REPRESENTATIVES OF ACADEMIA AND TRAINING		
Skills	• What particular skills do you feel are essential to 'sector X'?	

	• How do you think these skills needs are being met? • What particular skills shortages have you observed and how can that be corrected? • Which skillsets do you think are in greatest demand from sector employers? • How do training needs divide between academia and technical and vocational education and training and should the focus be placed more heavily on one or the other?	
Provision	• Does Jordan have a sufficient skills development and training infrastructure to deliver adequate training to meet demand? • Does the Government understand and support the need for training? • Does Jordan have sufficient numbers of qualified trainers and educators to deliver this training? • How does accreditation work in 'sector X'? Is due importance placed on accreditation? Are the requirements comprehensive, and does the training involved match employer needs?	
Engagement	• Do you receive a particular directive from the Government on what skillsets should be embedded in training? • Are you engaged in dialogue with the private sector about what skills are needed in the sector, and how do you embed that into training provision?	
QUESTIONS TO NGO STAFF		
Policy	• How has government policy shifted over recent years, and has it become more conducive to sector growth and investment? • Has the Government acknowledged the importance of a green and digital transition? • Has the Government taken into account non-Jordanian workers and the role they can play in this transition? • How do you see the role of NGOs in working with, supporting or challenging the Government on these issues?	

Skills	• Have you identified any particular skills shortages in the education and technical and vocational education and training landscape relevant to these sectors? What information are you gathering on the ground that can inform future government policy in this area?	
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