International Labour Organization

ILO brief

Research Brief

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Employment and Trade Impacts of the Wadi Al Arab Water System II Project in Jordan

A study by the Mainstreaming Employment into Trade and Investment in the Southern Mediterranean Programme[12]

Key findings

- **Total employment:** The study, Employment and Trade Impacts of the Wadi Al Arab Water System II Project, calculated an employment generation of **1,134** direct jobs, with **5,425** indirect and induced jobs added across various sectors.
- **Youth direct employment**: Youth aged 18–29 comprised approximately 48 per cent of the total direct employment, with most having a formal contract.
- **Female direct employment**: Female workers represented 4 per cent of the total direct employment, exceeding the 1.2 per cent of the national female rate in construction.
- **Foreign versus local direct employment**: Foreign workers, exclusively hired during the construction phase, made up 41 per cent of the total employment, while locally recruited workers accounted for 56 per cent, in line with Jordanian recruitment regulations.
- **Skills composition of direct employment**: Skilled workers comprised 70 per cent of the total employment, with 56.6 per cent skilled foreign workers and 30 per cent skilled youth workers.
- **Wage scales**: Women's wages, with few exceptions, were in the two-lowest income categories. Foreign youth workers earned more than their locally recruited counterparts. In general, the wages of foreign workers ranked among the highest wages reported.
- **Informality**: Around 13 per cent of all workers lacked a contract, with female workers most affected.
- **Indirect and induced employment effects**: The project showed a bias against skilled and formal jobs but positively biased female employment in both the indirect and induced effects.
- **Trade effects**: The clean water supply access that the Wadi Al Arab Water System II Project is providing, can ease Jordan's water scarcity in the Irbid Governorate by reducing the country's water dependency and lowering production costs of water-intensive products produced in the industrial zones.

[1] This brief is authored by Murad Samhouri, Joyanna Pelivani, and Luis Villanueva.
[2] Visit the ILO website for more information on the METI Programme.

Jordan's Labour Market and Water-Dependent Trade Dynamics

As of late 2023, Jordan's unemployment rate was 21.4 per cent, with female unemployment at 29.8 per cent and male unemployment at 18.9 per cent. Youth unemployment remained high, at 46.1 per cent, particularly affecting young women. Jordan has a highly educated workforce, with a 98 per cent literacy rate among adults. Yet, the mismatch between educational qualifications and job opportunities, especially for women, remains a critical issue in the country's labour market. Female labour force participation is among the lowest globally, at 14.7 per cent, compared with 21.3 per cent regionally. Employment rates in Jordan's construction sector have significantly increased since 2015.[3] Employment in the sector represented 4 per cent of the national workforce in 2022. Work injuries accounted for 4.9 per cent of total injuries and 13.9 per cent of fatalities in 2021. Informal employment is widespread, at 51.6 per cent of total employment. While the construction sector's informality was 89 per cent as of 2021.[4]

Photo description "A female construction engineer works as the only woman on a construction site in Amman, Jordan." Amman, Jordan. 12/2012. © Jared J. Kohlerl/ILO

Jordan is one of the most water-scarce countries in the world, with an unmet water demand projected to increase as of 2040. It relies on imported water, which adds pressure to its trade deficit. Yet, the water-intensive industry, agriculture and mining sectors contribute heavily to the country's export revenue. Irbid Governorate is a hub for agriculture and industry due to the industrial zones located there and thus has a crucial role in Jordan's export sector. The situation in the Irbid Governorate illustrates the intertwined relationship between water availability, economic activities and international trade.

Wadi Al Arab Water System II

- Irbid Governorate, Jordan
- Improve industrial access to potable water
- USD 130 million

▲ **1,134** Direct jobs

48% youth aged 18-29

41% foreign workers

4% women workers

▲ **5,425** Indirect and induced jobs

− Bias against skilled and formal jobs

\+ Bias towards female employment

Wadi Al Arab Water System II Project

The Wadi Al Arab Water System II Project aims to ease water scarcity in Jordan's Irbid Governorate by constructing an intake facility, a treatment plant, pumping facilities and a transmission pipeline to convey treated water to the Zabda Reservoir. Ultimately, in the short run, is intended to improve access to clean water, while in the long run, can contribute to reducing the country's dependency on imported water and thus lower production costs of the water-intensive products manufactured in the Irbid industrial zones. This study analyses the employment generated during the design and construction phase, from 2017 to 2020, as well as the first year of the operation and maintenance phase, from July 2022 to July 2023.

> Despite a highly educated workforce, Jordan faces a significant job-skills mismatch, especially impacting women.

[3] This rise is largely due to the implementation of Regulation No. 131 of 2016, which mandates that construction firms must hire Jordanian workers and recent graduates from the project's governorate.

[4] For all data, see Department of Statistics (2024); الصفحة الرئيسية - المؤسسة العامة للضمان الاجتماعي; ILOSTAT; ILO 2023b.

Study Methodology

The study, Employment and Trade Impacts of the Wadi Al Arab Water System II Project, used various methods to assess the direct employment effects: structured interviews with the project's promoters; a survey of 56 workers employed during the operation and maintenance phase; visits to the construction site; and review of project documents, such as the labour records and expenditure data, which were provided by the Water Authority of Jordan and the private companies involved in the project's construction. **Indirect and induced employment effects were evaluated through input–output analysis**. This macroeconomic technique modelled the economic interdependencies to estimate output and employment changes across sectors due to the project's demand shock. The analysis disaggregated employment effects into indirect impacts, driven by input purchases, and induced impacts, arising from increased consumer spending fuelled by project-related income.

Input–output analysis has many advantages: It is relatively easy to run and builds on transparent assumptions (fixed technical and labour coefficients, and the demand for intermediate inputs is a linear function of output). Additionally, the data required are accessible and the information contained in the input–output tables are "observable". Yet, **the assumptions behind the model also impose limitations** on the analysis.[5] For instance, the fixed coefficients assumption does not capture the fact that economies change their structure of production through time. Hence, the model does not capture technological change, which makes the model more suitable for short-run analysis rather than long-run examination. Fixed-labour coefficients may also lead to overestimation of employment outcomes due to the high value of labour coefficients in the agriculture sector (especially in developing countries). The assumptions behind input–output analysis also constrain the causal structure of the model and do not allow investigation of more complex causal relations, such as capacity changes on the supply side and non-linearity effects.

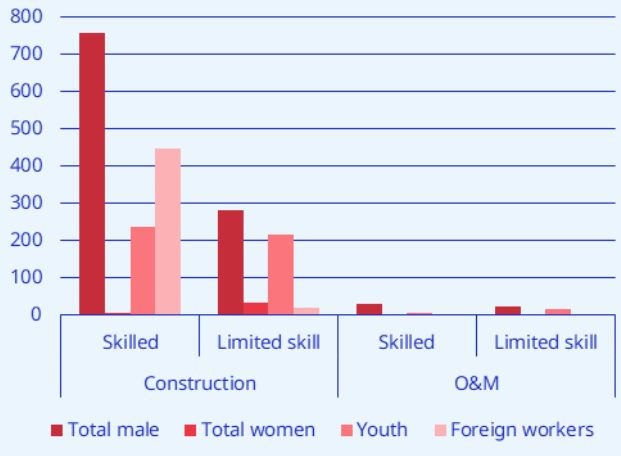
Employment Analysis

Direct employment effects

The Wadi Al Arab Water System II Project generated a total of 1,134 direct jobs (headcount). Of them, 1,078 were created during the three-year design and construction phase (averaging 283 jobs annually), and 56 jobs were generated during the one-year operation and maintenance phase. Female workers constituted 4 per cent of the total direct employment, highlighting the male-dominated nature of the construction sector, yet exceeding the national rate of women employed in the construction sector (at 1.2 per cent). Nearly half of the workers (48 per cent) who were directly employed through the project were aged 18–29.

The project employed a large share of foreign workers during the construction phase, at 41 per cent of the total direct employment generated (figure 1). The foreign workers were predominantly employees of the foreign construction firm managing the project. According to the project's implementer, the large share of foreign workers was due to the skills shortage in Jordan's labour market. The assessment also revealed a high rate of Jordanian workers locally recruited, constituting 56 per cent of the total direct employment. This finding reflects the project's adherence to Jordanian regulations that require local recruitment of more than 50 per cent of a workforce. Among the direct employment generated by the project, **70 per cent of the jobs were considered as requiring skills**. Foreign workers constituted 57 per cent of the total skilled employment, while youth accounted for 30 per cent of all skilled workers. More than 90 per cent of the foreign workers were skilled, indicating a trend towards the outsourcing of specialized roles. This raises questions about Jordan's ability to utilize its highly educated workforce effectively in specialized roles. Women were mostly employed in limited-skill roles.

Figure 1. Skills distribution of the total direct employment

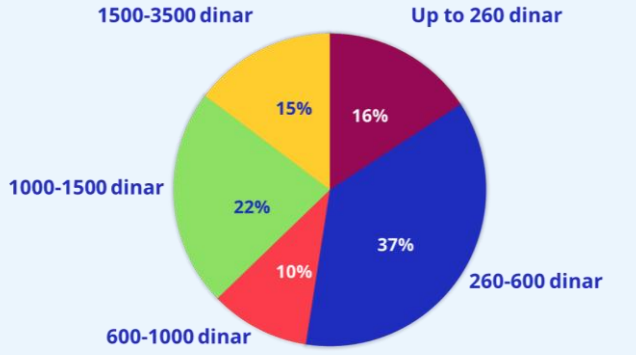


Note: O&M=operation and maintenance phase.
Source: Authors' calculations, based on project data.

[5] For detailed discussion on the assumptions behind the input–output analysis and its implications, see Jiang and La Marca 2021.

Analysis of the quality aspects of the direct employment

▶ **Figure 2.** Wage distribution of total direct employment



Source: Authors' calculations, based on project data.

Full and productive employment

Distinct variations emerged in the hiring of women and men: **Women mainly filled administrative positions while men dominated the technical and labour roles, with leadership roles going exclusively to men.**

The analysis of the contract types revealed that 13 per cent of workers each lacked a contract. The disaggregated data revealed that 17 per cent of female workers were employed without a contract, followed by 15 per cent of youth workers and 12 per cent of male workers. All foreign workers, who were predominantly skilled, were under a contractual agreement. Interestingly, half of the workers hired during the operation and maintenance phase did not have a contract.[6]

Social security

The survey of 56 workers employed during the operation and maintenance phase revealed that 33 of them (59 per cent) were enrolled in the country's social security scheme. Of them, however, not all benefited from full coverage of social protection: All 21 workers without a contract lacked social security coverage. This underscores the direct link between informal employment[7] and the absence of social protection for affected workers. Additionally, two contracted workers reported not having social security enrolment.

Wage distribution

The largest share of workers (at 37 per cent) earned between 260 and 600[8] Jordanian dinar per month during the phase analysed, followed by those earning between 1,000 dinar and 1,500 dinar, constituting 22 per cent of the total workforce (figure 2). Women's wages, with few exceptions, were in the two-lowest income categories during the construction and the operation and maintenance phases. More than half of the youth workers earned up to 600 dinar per month. Foreign youth workers earned more than their locally recruited counterparts. In general, the earning of foreign workers ranked among the higher wages. During the construction phase, the wage of skilled workers was between 260 dinar and 3,500 dinar per month, while during the operation and maintenance phase, the majority of the skilled workers' wages ranged from the minimum wage of 240 dinars up to 600 dinar per month.

Indirect and induced employment effects

The project was estimated to have generated a total of 5,425 indirect and induced jobs (full-time equivalent, or FTE). Using the input–output multiplier analysis,[9] the assessment found that the "other services" sector contributed the most, at around 2,380 jobs, followed by the construction sector, with 1,367 jobs, and then the wholesale and retail trade sector, with 469 jobs.

> The project was estimated to have generated a total of 5,425 indirect and induced jobs.

[6] The project's operation phase occurred during the start of the COVID-19 crisis, when the Jordanian Government adopted the Defence Law, suspending much government employment. The Wadi Al Arab Water System II Project was not suspended because it guaranteed the continuation of livelihoods. The Yarmouk Water Company employed a limited number of staff through a third party (services purchase – عقود شراء خدمات). According to the project implementer, the violations of labour rights occurred by companies from which the services were purchased.

[7] Employment formality refers to whether workers are engaged in economic activities that are – in law or in practice – not covered or insufficiently covered by formal arrangements. For more details, see the statistical definition provided by ILO here.

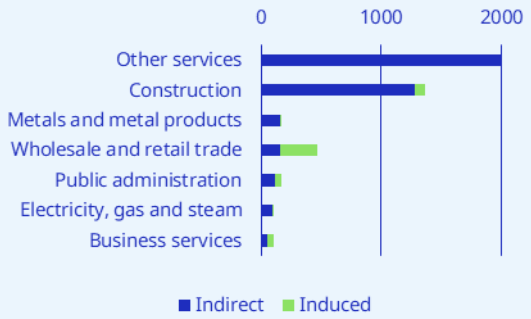
[8] As of 2021, the statutory monthly minimum wage was 260 dinar. During the analysed period, the minimum wage was 240 dinar per month.

[9] This methodological approach relies on several assumptions that tend to produce overestimated results. It is advised to take these results with caution. The FTE results provided here are not comparable with the direct effects that are provided in headcounts.

The proportion of female and youth workers was similar for both indirect and induced employment effects. In contrast, the proportion of skilled and informal workers had different magnitudes, depending on the employment effect. There was a larger proportion of skilled workers among the induced effect employment, while informal workers were more associated with indirect employment generation.

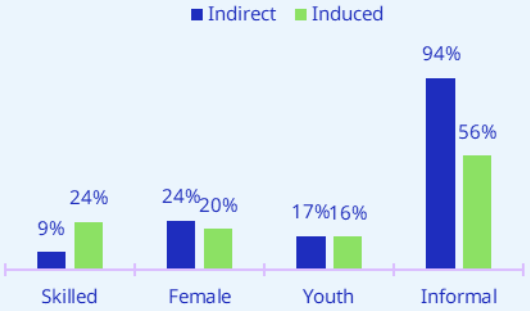
The assessment also found that the project disadvantaged skilled and formal employment, yet it positively influenced the creation of job positions occupied by women, evident in both the indirect and induced effects (figures 3 and 4). The project also disadvantaged youth employment, although to a small degree. The large degree of informal employment creation among indirect employment was particularly evident in the "other services" sector, known for its substantial proportion of informal jobs.

Figure 3. Estimated employment impact, by sector and employment effect (FTE)



Source: Authors' calculations.

Figure 4. Proportion of skilled, female, youth and informal workers, by employment effect (% of total)



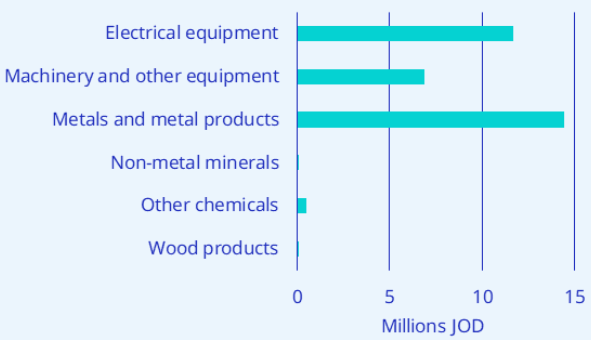
Source: Authors' calculations.

Trade Analysis

The access to clean water that the Wadi Al Arab Water System II Project is providing could ease Jordan's water scarcity in Irbid Governorate. Decreasing the imported water also could improve Jordan's balance of trade, considering that the unmet water demand is projected to increase by 2040.

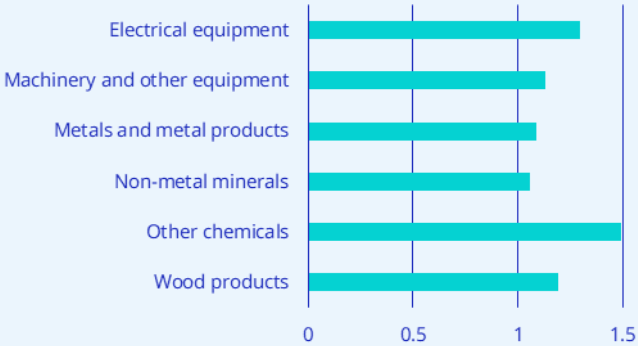
The assessment also looked at the cost of imported goods for the construction of the project (figure 5). More than 10 million dinar were spent on the importation of electrical equipment and metals and metal products. Interestingly, these two sectors are well developed in Jordan. Metals products were the eighth-most exported product in 2022, according to the Observatory of Economic Complexity. When measuring the interconnection of these industries (figure 6) to other industries from which they purchase their inputs to produce their final output – the so-called "backward linkage", these industries had considerable backward linkages, implying possible job generation lost due to the importation of materials.

Figure 5. Project's cost of imported goods



Source: Authors' calculations.

Figure 6. Project's backwards linkages



Source: Authors' calculations.

Forward Looking

The following recommendations were arrived at through consultation with the **Policy Working Group*** members in Jordan. The discussion with the social partners centred on how to better address the work deficit in investment initiatives and to guide future actions towards improving employment conditions in the country's construction sector.

- **Training of workers:** Establish connections between training agencies and project implementers to develop customized programmes that cater to the specific skill demands of the labour market. Training should focus on equipping workers, particularly those recruited locally, with a diverse skill set to enhance their employability post-construction. Considering the cost of employee training, it is worth partnering with government support. This would alleviate the financial burden solely borne by employers and promote the provision of comprehensive training programmes.
- **Labour inspection**: Implement regular inspections at construction sites to ensure adherence to labour rights and standards.
- **Public procurement:** Enhance the monitoring of national laws and the special provision on bids, which mandate that at least 30 per cent of a project's implementation be allocated to Jordanian contractors. Involving local businesses not only creates employment opportunities within the country, thus reducing the need for foreign specialized labour, it also stimulates the economy. Encouraging local businesses to supply construction materials can lead to a broader economic spillover effect
- **Investment assessment:** Incorporate an employment impact assessment into government mechanisms as a strategic tool for guiding investment decisions. The employment implications and broader economic
- **Public awareness:** Increase awareness to challenge the societal and cultural biases associated with the construction sector. These biases often deter individuals, especially women, from exploring job opportunities within the sector. Despite overcoming these hurdles, women may still encounter negative stereotypes. Addressing this societal bias through public awareness initiatives is crucial to cultivate a more inclusive and respectful work environment.

*Social partners' views were discussed during a validation workshop in Amman, 3 July 2024, when the findings of the study Employment and Trade Impacts of the Wadi Al Arab Water System II Project were presented. For more information, visit the METI website

Resources

"Asharq Al-Awsat: 50 Mln Cubic Meters Sale of Water to Jordan", *Asharq Al-Awsat,* 3 July 2021.
Department of Statistics. 2023. "Employment and Unemployment". Amman.
ILO. 2016. *ILO - Local Economic Development Strategy for Irbid Governorate: 2016–2018*.
—. 2012. *Macroeconomic Policies and Employment in Jordan: Tackling the Paradox of Job-Poor Growth*.
—. 2022a. *The Impact of Trade and Investment Policies on Productive and Decent Work*.
—. 2022b. *Trade, Investment and Employment in the Southern Mediterranean Countries*.
—. 2023a. "*Growth, Macroeconomic Policies and Employment: The Impact of Macroeconomic and Trade Policies on Employment Generation in Jordan*.
—. 2023b. "ILOSTAT Data Explorer".
Kucera, David, and William Milberg. 2000. "Gender Segregation and Gender Bias in Manufacturing Trade Expansion: Revisiting the 'Wood Asymmetry'". *World Development* 28 (7): 1191–1210.
Multidisciplinary Digital Publishing Institute. 2023. *Water Resources in Jordan: A Review of Current Challenges and Future Opportunities*.
Observatory of Economic Complexity. "Metals in Jordan".
Jiang, Xiao and Massimiliano La Marca. 2023. *Employment Impact Assessment of the Zambian Great North Road Upgrading (GNRU) Project*. STRENGTHEN2, ILO.

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