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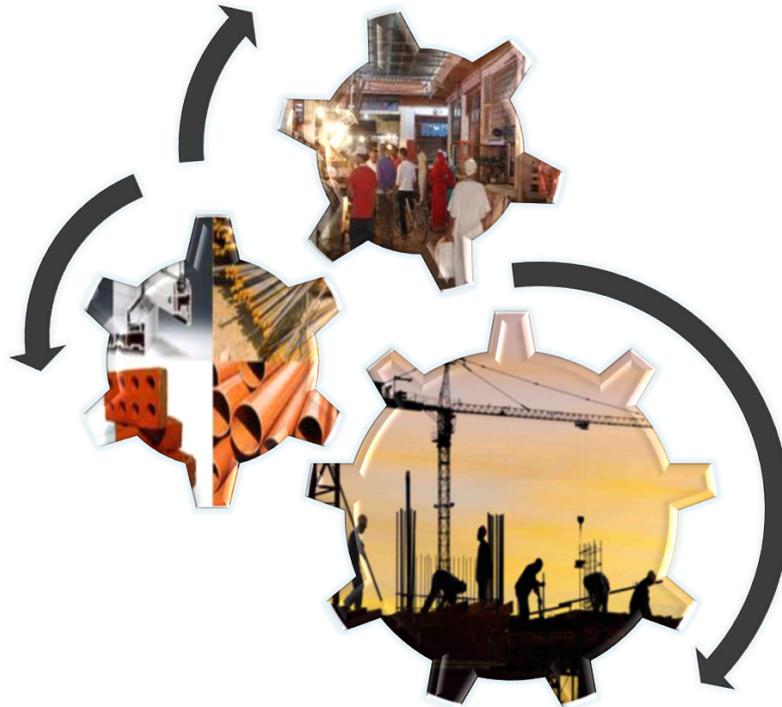
Study on the employment impact
of EIB infrastructure investments
in the Mediterranean partner countries

Summary Report



Employment impact of EIB infrastructure investments in the Mediterranean Partner Countries

Summary report
June 2015



This is the summary report of a study, which results from a partnership between the EIB and the ILO. The study was carried out with the financial assistance of the FEMIP Trust Fund and an ILO Special Budget Allocation.

The FEMIP Trust Fund was established in 2004 and has been financed by 16 EU Member States and the European Commission. It is managed by the European Investment Bank and is intended to support the development of the private sector via the financing of studies and technical assistance measures and the provision of private equity. This EIB-ILO study is part of the Technical Assistance Window of the FEMIP Trust Fund.

The authors take full responsibility for the contents of this document. The opinions expressed do not necessarily reflect the views of the European Union or the European Investment Bank.

Acronyms

EIB	European Investment Bank
EU	European Union
EUR	Euro
EPAP II	Second Egyptian Pollution Abatement Project
FEMIP	Facility for Euro-Mediterranean Investment and Partnership
FTE	Full Time Equivalent
GW	Giga Watt
ILO	International Labour Organisation
I-O [table]	Input-Output [table]
MENA	Middle East and North Africa
MPC	Mediterranean Partner Countries
PPP	Private-Public Partnership
TVET	Technical Vocational Education and Training

1 Introduction

Preceding the global economic crisis, most of the Mediterranean Partner Countries (MPC) supported by EIB-FEMIP (European Investment Bank – Facility for Euro-Mediterranean Investment and Partnership) saw solid growth rates and economic reforms that were successful in many sectors including infrastructure. However, this growth did not translate into sufficient job creation. The countries have also suffered from the global recession in 2008 and, although there are encouraging signs of economic recovery worldwide, the ILO Global Employment Report 2014 finds that those economic improvements will not be sufficient to absorb the major labour market imbalances that built up in recent years: current development policies do not generate sufficient employment opportunities for the fast-growing population and many workers find only vulnerable jobs in the informal economy. A major challenge in countries of the region is youth unemployment which remains among the highest in the world. In addition, the Syrian refugee crisis in MPC such as Jordan and Lebanon is putting heavy pressure on their natural resources and economy, including the labour market. There are strong concerns about the effects on wage levels, working conditions, child labour and increased labour market informalisation.

The EIB and the ILO therefore undertook this joint study with the overall objective of providing the EIB and its partner countries with a set of practical recommendations on how to analyse and monitor the employment outcomes of the EIB infrastructure portfolio in MPC and formulate some wider recommendations on how to optimize employment impacts in infrastructure projects.

2 Approach and methodology

The current study focuses on four lower middle-income, oil importing countries in this region: Egypt, Jordan, Morocco and Tunisia. It covers four main infrastructure sectors (transport, energy, sanitation and environment), with Morocco having four investment projects analysed, Egypt having three projects, and Tunisia and Jordan having two projects each.

The study was divided into two parts: 1) a detailed analysis of a selected number of representative projects to assess the number of direct jobs created, as well as the quality of employment generated; and 2) simulations using macro-economic models to assess the indirect and induced job creation.

For the first part of the study the consultants were tasked to answer the following four main questions for each project:

- ▶ How many direct jobs are created during construction, operation and maintenance?
- ▶ Who gets the jobs?
- ▶ What kinds of jobs are created?
- ▶ Do the jobs go where they are most needed?

To meet the objectives of this study, a combination of data collection methods was used:

- Key informants interviews (using a semi-structured interview questionnaire):
 - ministries or agencies involved in the projects' construction and operation and maintenance
 - contractors and sub-contractors,

- labourers for on-going projects, where possible
- Site visits
- Review of documents.

Once the data was collected, collated and analysed, the second part was launched involving senior economic analysts from the four countries. The gathered information was ranked according to the different branches of the economy and plugged into macro-economic models for assessment in order to complete the picture of the broad employment impact of the analysed interventions. The study aimed at using a set of compatible existing macro models, which are capable of capturing the direct, indirect and induced effect on production, income and employment.

3 Results of the case studies

3.1 Eleven projects in four countries

The eleven projects in Egypt, Jordan, Morocco and Tunisia originate from four sectors: transport; energy; sanitation; and environment. They were implemented using either high technology or equipment based approaches (heavy earthmoving equipment).

The study's assessment of the **transport sector**, relating to road works in both urban and rural environments (flat, rolling and hilly terrains), includes one project each in Morocco, Tunisia and Jordan:

1. The **Second National Programme of Rural Roads (NPRR-2) in Morocco** seeks to increase the access of the rural population to all-weather roads to 80% by 2015. It consists of over 1,000 sub-projects (of which 117 funded by EIB) totalling 15,000 km to be either of low cost seal standard or all-weather earth and gravel roads.
2. The **Urban Priority Roads V in Tunisia** is composed of 12 sub-projects (5 studied) that aim to reduce traffic congestion in Tunis and other cities by constructing roads and interchanges using traditional road construction technology.
3. The **Amman Development Corridor in Jordan** includes a section of a 41 km four-lane bypass highway around the eastern side of Amman to remove key transport bottlenecks and to provide access to affordable land for productive investment and urban development purposes.

The study's assessment of the **energy sector** includes one project each in Morocco, Tunisia and Jordan; and two in Egypt:

1. The **Solar Plant in Ouarzazate in Morocco** is the first of a series of projects aiming to install 2GW of new solar capacity in Morocco by 2020. This project entails the development and construction of a 500 MW power plant.
2. The **Power Station Sousse C in Tunisia** involves the construction and operation of a dual-fuel (gas as main fuel and gasoil as reserve/emergency) power generation plant. It consists of a single-shaft Combined Cycle Power Turbine unit of 400MW. An international consortium and 46 different local sub-contractors undertook the construction work.
3. The **Tafila Wind Farm in Jordan** entails the development, construction and operation of a 117 MW wind farm equipped with 38 turbines with a unit capacity of 3.075 MW. The project was just starting up at the time of the study; therefore, employment data were not available at the time of the assessment.

4. The **Giza North Power Plant in Egypt** with an overall generation capacity of 2,250 MW is an important addition to the capacity of Egypt’s power system. The project, which uses natural gas as the principal fuel in Combined Cycle Gas Turbine technology, is both technically and environmentally advanced and uses the most-efficient fossil-fuel electricity generation technologies commercially available today at the needed scale.
5. The **Egypt Power Transmission Project** comprises a multi-component investment program for transmission infrastructure (10 transmission lines, 1 underground cable, 10 substations and 22 additional transformers). The investments are expected to contribute to the provision of a reliable electricity supply for the increasing demand of the country, in part connecting new wind energy generation facilities to the grid and enabling future interconnections to neighbouring country networks (notably to Saudi Arabia and Gaza).

The study’s assessment of the **sanitation sector** includes two projects in **Morocco**:

1. The **Sanitation Project in Oujda** concerns the rehabilitation, restructuring and extension of the sewerage network as well as construction of the first treatment plant in the city of Oujda, targeting some 450,000 residents.
2. The **Sanitation Project in the Sebou River Basin** includes the construction of collection and treatment facilities of wastewater in 17 urban centres, mostly located in the Sebou Basin which extends over an area of 40,000 km². The Sebou basin accommodates more than 6 million people, or 20% of the population of Morocco, and is considered the nation’s most polluted basin.

The study’s assessment of the **environmental sector** includes one project in **Egypt**:

1. The **Second Egyptian Pollution Abatement Project (EPAP II)** focuses mainly on pollution abatement in major hot spots in the Alexandria and Greater Cairo Governorates targeting the industrial sector at large. In total, over 100 projects have been financed to date in a number of areas of which four were examined: Solvent Recovery in the Paper Industry - Retrographia; Wastewater Treatment at Abu Qir Fertilizers; Utilization of alternate fuels at Arab Cement factory; and Neuman mills rehabilitation at Abu Zabal Fertilizers reducing air emissions and air pollution resulting from the process.

3.2 Four questions and fourteen findings

The consultants arrived at the following 14 findings related to the 4 main questions in relation to direct employment:

3.2.1 Number of jobs created

Finding 1: Infrastructure work has the potential to generate large numbers of jobs, but the results suggest that the estimates of direct employment created through the assessed projects were lower than expected in general. The numbers of direct jobs created (site visits and/or contractor estimates), were lower than the numbers estimated beforehand except for two projects. The differences were due to: use of equipment-intensive methods of construction and/or high technology projects with high import components, e.g. the energy sector applies sophisticated technology, uses imported equipment and employs more educated staff. The study shows variations in wage share within and between sectors, as shown in the table below. In the last five years, employment has become a more pressing issue for the MPC, and the EIB has increased efforts to

provide more accurate estimation of direct employment at appraisal stage. In addition, a new internal Guidance Note detailing the methodology used by the Bank’s Projects Directorate was developed last year in 2014.

Projects	Brief description	Contractor	Tech	Wage share
2 nd National Rural Roads Programme	a large rural roads project with many sub-projects	small & medium national	equip. based	13%
Urban Priority Roads V	12 projects to reduce traffic congestion in urban cities	national	equip. based	14%
Amman Ring Road	a 41 km four-lane bypass highway around Amman	international	equip. based	21%
Solar Energy in Ouarzazate	development and construction of a 500 MW power plant	international (PPP arr.)	high tech	3%
Power Station Sousse	construction and operation of dual-fuel power plant	international	high tech	9%
Tafila Wind Farm	a 117 MW wind farm equipped with 38 turbines	international	high tech	not avail.
Giza North Power Plant	construction of a 2,250 MW power plant using combined cycle gas turbine technology	national and international	high tech	10%
Egypt Power Transmission	construction of 10 transmission lines, one underground cable, 10 substations and 22 transformers	national and international	high tech	11%
Sanitation in Oujda	construction of sewage network and treatment plant	national and international	equip. based	4%
Sanitation in Sebou Basin	construction collection and treatment infrastructure in 17 urban centres	national and international	equip. based	11%
EPAP II	pollution abatement in the Alexandria and Greater Cairo Governorates targeting the industrial sector	International and factory’s own workforce	equip. based	from 1 to 19%

Finding 2: The cost of employment varies considerably between projects: The transport sector represented by road projects, in both urban and rural settings, generated the most jobs per EUR 1 million of total investment cost followed by the sanitation sector. These two sectors should have about the same potential to generate jobs, but it depends on the actual nature of the project and the environment in which it is implemented. For the environmental projects, those involving alternative fuels generate the largest employment potential.

Finding 3: There was limited monitoring and reporting of employment data of the implemented projects. With the exception of the Giza North Power Station and the Sebou Basin sanitation project, which had technical assistance engaged as part of the loans, little structured reporting including employment data occurred. For some of the smaller rural roads projects, employment figures were not documented at all, but rather based on memory of the contractors’ staff.

3.2.2 Characteristics of employment

Finding 4: The labourer category represents about 70% of total number of employees and the overall figures showed that project management and engineers make up about 10% of the total labour force. Technicians account for about 15%. There are variations, but most projects had a minimum of 50% of labourers with a maximum of 92%.

Finding 5: An equal share of skilled and unskilled labour. The use of modern construction methods and technology requires more labour that is skilled and their share is about the same as the share of unskilled labourers.

Finding 6: Most employees were men, while women were usually restricted to administrative work. One exception was the Ouarzazate solar plant project in Morocco, which employed female engineers. The energy projects assessed show a greater openness to employ women, and the operational phase presents opportunities for the employment of women as the energy sector is also a more “refined” work environment than, for example, jobs offered in the road or sanitation sectors. The study also showed that women had taken up jobs such as health and safety inspectors.

3.2.3 Types of jobs created

Finding 7: There was an equal split between permanent and temporary jobs in construction. The road projects show a high proportion of permanent staff¹ and it is common that contractors have their own supervisory staff and skilled labourers such as masons, bar-benders etc. The more mechanised the operations, the higher the need for skilled operators. The energy projects show a high proportion of temporary labourers and the same applies to the two sanitation projects assessed.

Finding 8: Labour work is not considered attractive in any of the four countries and a “culture of shame” exists in Jordan resulting in very few Jordanians being interested in this type of work. This leads to a large influx of migrant labourers. In Morocco, Tunisia and Egypt with the exception of the highly specialized jobs, all jobs are taken by nationals. In Egypt’s rural areas, work on construction sites is seen negatively as hard work with long hours compared to people’s current occupation in agriculture.

Finding 9: Health and safety requirements are in place generally. There were differences between the countries: in Morocco, with the exception of the Ouarzazate project, health and safety officers were seldom hired as there is a general lack of qualified health and safety supervisors; whilst in Tunisia and Jordan there were stringent requirements stipulated in the contracts, and health and safety officers were hired on most of the projects assessed. Particularly high and strict occupational safety standards were observed in the Giza North Power Station in Egypt project both in terms of practices on the construction site, and the reporting of data related to injuries and down time.

Finding 10: Certain infrastructure sectors offer long-term maintenance employment in large numbers. Maintenance of roads and sanitation projects provides long-term employment for local labour and, if not continuously, for long periods of the year. The employment potential in road projects is mainly related to different maintenance operations (routine, periodic and emergency).

¹ Permanent staff from a private contractor’s perspective is qualified staff maintained by the contractor for the full duration of the project and who they move to other projects. This is opposed to temporary jobs, hired on a daily or other short-term basis. At EIB, employment during project implementation is reported in terms of the total labour requirement (number of FTE jobs times the length of the implementation period). Employment during project operation and maintenance refers to the average annual number of Full Time Equivalent (FTE) jobs required.

Renewable energy projects, such as wind-farms and solar plants, create fewer employment opportunities – wind turbines can run with little need for human supervision. Finally, alternative fuel projects implemented by the industrial sector in Egypt (EPAP II) are dependent on labour to collect and screen municipal waste. These are labour-intensive activities.

3.2.4 How the job opportunities are filled

Finding 11: Only three projects show a significant proportion of youth engaged and it appears that young labourers had not been particularly targeted in most of the projects. In the Second National Rural Roads Programme in Morocco and the two energy projects in Egypt, youth reached 30% or more of the total workforce.

Finding 12: Labour demand and supply do not match. In all countries, several interviewed contractors indicated that they always face a shortage of skilled labour for specialised projects. There is a general lack of skilled labour such as technicians, electricians, carpenters, masons and bar-benders. In general, a perceived low cultural value is associated with manual labour, especially in the construction sector, that may to some extent explain the lack of availability.

Finding 13: Labourers are hired from the local areas as hiring labour far away from the project’s location is cumbersome due to the need for housing and transportation for such labour. In the Giza North Power Station (Egypt), it was reported that although there were job openings for female local residents they were uncomfortable working for private contractors, which was attributed to local customs. The study team believes rather that it is related to the general sense of job-security associated with governmental employment throughout the region. In addition, the poorest strata of society were not particularly targeted: these are large-scale projects using advanced technologies and the contractors hire labourers according to the skills needed.

3.3 Results from the macro analysis

The next table summarises the direct, indirect and induced employment² in percentages of the total employment effect for the different projects in the four countries.

	Direct	Indirect	Induced	T1 ³	T2
<i>Jordan</i>					
Amman Ring Road	37%	33%	30%	1.87	2.67
Tafila Wind Park	41%	36%	23%	1.87	2.42
<i>Morocco</i>					
PNRR II	26%	41%	33%	2.58	3.83
Solar project	21%	70%	9%	4.41	4.86
Oujda sanitation	35%	51%	14%	2.48	2.88
Sebou sanitation	37%	48%	15%	2.29	2.68
<i>Tunisia</i>					
Urban Roads V	63%	21%	15%	1.34	1.57
Power Station Sousse	62%	22%	16%	1.35	1.61

² Direct employment = employment created by the construction project including senior staff, technicians, workers directly recruited by the main contractor and sub-contractors; Indirect employment = employment created in the backward-linked industries, supplying tools, materials, plant and equipment for the construction project; Induced employment = employment occurring as households benefiting from direct and indirect employment spend some of their additional income on goods and services in the local economy.

³ T1 equals the sum of direct+indirect employment divided by direct employment while T2 equals the sum of direct+indirect+induced employment divided by direct employment

<i>Egypt</i>					
Giza North Power Station	17%	66%	17%	4.97	5.97
Power Transmission Project	19%	60%	21%	4.19	5.32
Pollution Abatement Project	19%	60%	21%	4.18	5.32

- Although there are slight methodological differences as well as some data differences between countries, in every country recent closed I-O tables were used and related employment multipliers calculated.
- Particularly in Egypt and Morocco, the indirect employment effect is considerable and even higher than the direct effect, especially in the energy sector.
- The induced effect is less important but still significant. The difference between T1 and T2 is particularly high in road construction, as there are more unskilled labourers with lower incomes than in the other projects. Unskilled labourers with low incomes tend to have a high propensity to consume goods produced in the local market.
- The study gives some good indications on multiplier effects in MPC for projects in selected sectors and could be replicated in other oil importing countries in the region with comparable economies. Nevertheless, the small number of projects is still too limited to draw fully reliable conclusions.

4 The way forward

4.1 The way forward for EIB

Recommendation 1: Improve estimation and monitoring of employment in EIB infrastructure projects

Assessing the size of employment impacts from investments in infrastructure is important for governments in the decision-making process as they face trade-offs with other investment alternatives. Employment can be a significant criterion in this process.

As there is a need to have realistic employment targets in the logframe of any project co-financed by EIB this study proposes the following steps to be implemented gradually:

- **At appraisal stage - step 1: Gradually establish a dataset of reliable key direct employment indicators specific to MPC⁴:**
 - a. Average labour intensity per infrastructure sector
 - b. Average annual wage cost per type of infrastructure sector (deduced from the composition of the labour force on projects and average wage costs per category – professional, technical, skilled and unskilled - which change considerably according to the infrastructure sector)
 - c. FTE per EUR 1 million of total investment cost (implementation-only to start with, as figures for operation and maintenance require longer-term data collection).

⁴ Such a dataset is already established by EIB for the EU Member States for which there are more detailed data on labour costs and other parameters available. These parameters are not yet available for large-scale investment projects in MPC.

The results of the current study could serve as a start with the addition of other EIB/IFI projects in MPC where employment has been recorded, and/or with new projects moving forward. This study also recommends expanding study samples by collaborating with other IFIs and other bilateral donors as a mid-term measure.

- **At implementation stage - step 2: Monitor and record employment figures at project level:**

This study proposes the requirement to record and provide employment data on a regular basis to be included in loan agreements and contracts. Such data collection requirements could include information such as the number of women, men and youth engaged per employment category and the number of workdays paid for. If possible such data collection could be included in Monitoring and Information Systems (MIS) where they exist.

- **At completion stage - step 3: Analyse completed projects to update key indicators (long-term)**

In countries where the Government and/or EIB are interested in having a more complete employment picture of EIB investments, the indirect and induced employment effects could be analysed to enrich policy discussions for different infrastructure sectors. Indirect and induced effects are usually not counted as employment impacts when appraising projects, but are useful when EIB enters into policy discussions with partner countries to decide on which sectors to support. This requires in-depth analysis and might be time-consuming.

- **At policy level - step 4: Carry out macro-assessments of completed projects of selected infrastructure sectors or sub-sectors to obtain a set of employment multipliers in MPC, or use these multipliers from the same types of projects in countries having similar economic patterns.**

If a quick reply is needed to understand the employment dimension of selected infrastructure projects, technical coefficients by subsectors obtained through this project could be adjusted (including updates) to reflect the specific country contexts of other MPC, although they are based on a small sample size and show significant inter-sector variations. A more comprehensive and detailed analysis would entail using a standardised macro model (in this case, a closed I-O model), which could be adjusted by using micro data collected through proposed MIS systems, although this would take significant time and effort taking into account the considerable methodological challenges involved.

Recommendation 2: Enhance the employment content in the EIB infrastructure portfolio

- **Consider balancing** large-scale infrastructure investments with lower-cost local infrastructure investments, which tend to generate more immediate employment opportunities, noting that employment is only one dimension taken into account during project selection and that this is also a matter for the MPC proposing projects for financing.
- Apply appropriate **technologies**, based on technical feasibility and economic justifications.
- Include a cost item in Bill of Quantities to cover costs of **apprenticeships** during implementation of projects.

4.2 The way forward for the Mediterranean Partner Countries

The recommendations set out below are in line with labour market reforms specified in National Employment Strategies recently being developed in several MPC and which underline the need to better know the impact of sectoral policies.

Recommendation 3: Design projects with more emphasis on optimising employment for funding by IFIs

In line with the recommendations addressed to EIB, the same applies to recipient governments: there is a need to consider prioritising employment creation during design of projects for funding by IFIs; to monitor infrastructure project employment generation more closely; and to collect better data.

Recommendation 4: Address skill gaps in infrastructure investment by revisiting the technical and vocational education and training (TVET) approach for the infrastructure sector

The infrastructure sector is facing significant skills shortages worldwide. In particular, the categories of jobs that proved particularly difficult for employers to fill include engineers, technicians, skilled trade labourers and labourers — all critical to the infrastructure sector. Often, adequate job profiles do not exist and appropriate training programmes are therefore not available. Hence there is a need to further develop the vocational and technical training system in MPC to meet the growing needs of the sector.

This includes updating or developing new curricula through continuous dialogue with employers to align education and training with infrastructure development needs. Skill-based training should not be pursued on a project-by-project basis, but as a sector wide and continuous development activity with effective training financing mechanisms.

This document presents the findings of a study carried out by the EIB and the International Labour Organization (ILO) with the financial support of the FEMIP Trust Fund. It reflects an analysis of the impact that EIB infrastructure projects have on employment in the Mediterranean partner countries, both in terms of quality and quantity.

The study was divided into two parts. The first part focused on detailed analysis of a selected number of projects from four countries – Egypt, Jordan, Morocco and Tunisia – in four key sectors – Transport, Energy, Sanitation, and Environment. The second part provided assessments of the indirect and induced job creation, based on macro-economic modelling techniques using the input-output model. The study concludes with a set of practical recommendations for how the EIB and its partner countries could seek to optimise employment impacts in infrastructure projects.

This report was presented to stakeholders at regional workshops in Rabat and Cairo in November 2014 and April 2015, and integrates feedback from the partner countries.

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