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The American University in Cairo  
School of Sciences and Engineering

# **Infrastructure Projects in Egypt: A Decision-Support Framework for The Selection from World Bank Lending Instruments**

A Thesis Submitted to

The Department of Construction Engineering

in partial fulfillment of the requirements for  
the degree of Master of Science  
in Construction Management

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**Spring 2018**

**STATEMENT**

*“Let knowledge grow from more to more, but more of reverence in us dwell”*

Alfred Tennyson

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## Abstract

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The funding of large-scale high-risk infrastructure projects is of growing importance in Egypt. The Government of Egypt (GoE) partners with several International Financial Institutions (IFIs) to secure the funding of infrastructure projects that are essential to supporting sustainable development. The World Bank is one of the largest IFIs that support infrastructure projects in Egypt. The World Bank Group is formed of the International Finance Corporation (IFC), International Centre for Settlement of Investment Disputes (ICSID), Multilateral Investment Guarantee Agency (MIGA), the International Bank for Reconstruction and Development (IBRD), and the International Development Association (IDA). The IBRD and the IDA form “The World Bank”. The Bank provides three main financing instruments, namely Development Policy Finance (DPF), Investment Project Finance (IPF), and the relatively recently proposed Program-for-Results (P-for-R). The latter two are currently used to support an array of infrastructure projects dispersed in a variety of developing nations.

The aim of this research is to compare between IPF and P-for-R funding mechanisms and to propose a framework for the selection of the best-suited instrument for any given infrastructure project in Egypt. Structured interviews are conducted with 21 international experts working on World Bank financed projects in Egypt in order to identify the criteria for the optimum selection of finance methods, risks associated with different infrastructure projects, and which instrument better addresses each of these risks. It was found that IPF better addresses risks related to Technical Design and Implementation, while P-for-R is better suited for Institutional Capacity and Sector Strategy risks.

The outcome of the interviews and the existing literature are analyzed to develop a 4-step framework for the selection of the optimum finance instrument. The developed framework includes a logistic regression model that matches the risk profile of a given project with the most appropriate instrument. Finally, the framework is applied on two case studies in Egypt in order to assess its validity. The first case study, the SRSSP is a sanitation program funded through P-for-R which was confirmed by the devised framework to be the better-suited tool for the nature of the project. The performance of SRSSP was compared to the performance of 2 very similar projects that were funded through IPF and it was verified that the performance of the P-for-R funded SRSSP is more satisfactory. The framework as then applied on another case study which is the GNPP. The GNPP is an IPF project which also matches the output of the framework and its performance has been assessed as satisfactory by the World Bank. It was concluded that the output of developed framework is valid and it can effectively support the selection of the best-suited funding instrument for a given infrastructure project in Egypt.

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## List of Acronyms

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BP	Bank Procedure
CAS	Country Assistance Framework
CBE	Central Bank of Egypt
CPF	Country Partnership Framework
DLI	Disbursement Linked Indicators
DPF	Development Policy Finance
EBRD	European Bank for Reconstruction Development
EIB	European Investment Bank
GIZ	Gesellschaft für Internationale Zusammenarbeit
GNPP	Giza North Power Project
GoE	Government of Egypt
IBRD	International Bank for Reconstruction Development
IDA	International Development Association
IFC	International Finance Corporation
IFIs	International Finance Institutions
IPF	Investment Project Finance
KfW	Kreditanstalt für Wiederaufbau
MIGA	Multilateral Investment Guarantee Agency
MoF	Ministry of Finance
MoHUU	Ministry of Housing, Utilities and Urban Communities
OP	Bank Policy
PAD	Project Appraisal Document
PforR	Program-for-Results Finance
PID	Project Identification Document
PMU	Project Management Unit
RBF	Result-based Finance
SORT	Systemetic Operation Risk Rating Tool
SRSSP	Sustainable Rural Sanitation Services Program

# Chapter I: Introduction

---

## I.1 Background

### I.1.1 Financing Infrastructure

The development of infrastructure is necessary for inciting economic growth, combating poverty, and improving the quality of life of citizens. The Government of Egypt (GoE) has committed to an ambitious Sustainable Development Strategy widely referred to as “Egypt 2030”. The four pillars of this strategy are Economic Development, Citizen Happiness, Human Development, and Market Competitiveness (GoE, 2017). The cornerstone for achieving significant improvements in such domains is the development of the various infrastructure sectors such as health, sanitation, education, energy, irrigation, and transportation. Accordingly, a major portion of Egypt’s budget is expected to be dedicated to investing in infrastructure development. Hence, the effective management of investments in infrastructure and the search of the best-suited instruments for financing such projects are of paramount importance.

### I.1.2 Financial Management Processes

The cost of financial resources in large-scale construction projects can be as much as 20% of the project budget, the total cost of finance including interest rates and payable returns on equity can go up to 60% by the time the loan is recovered (Turner, 2007). This makes financial resources the most expensive resource and hence there is a need to shed light on the effective management of these resources. Turner (2007) identifies five main processes in the management of financial resources:

- **Feasibility Study and Financial Assessment:** At this stage all concerns of project stakeholders including project sponsors and lenders must be

addressed. Such concerns vary according to the financing scheme adopted. The output of this stage is the project total cost and total amount to be borrowed

- **Financial Planning:**

- Project stakeholders build on the output obtained from the previous stage to develop a schedule for forecasted payments and conduct a cash flow analysis to forecast the amount and time of overdraft that will be financed through debt.
- A financial strategy is then planned to include a reasonable blend of debt and equity (or public funds), and a typically a debt/equity ratio is agreed.
- An extensive search for possible sources of finance (whether debt or equity) is conducted. Once the sources of finance are identified, the project financial structure is then further developed and optimized.

- **Raising Project Capital/Financial Package Arrangement:** In this stage, the project capital is raised in accordance with the financial plan. Project stakeholders reach out for possible sources of equity, loans, insurance and other less conventional sources of finance.

- **Monitoring and Control:** Once the capital is raised and the project is initiated, project expenses and cost estimates to completion are monitored closely against the project progress. Timely corrective actions are crucial in this phase to prevent cost overruns or arrange for additional financing to cover additional unplanned expenses.

- **Controlling Risks:** The first step of this process is the risk identification and it is a recurring process that starts in the project concept stage. Following risk identification risk analysis is conducted and risk mitigation and response

strategies are developed. Risks with highest severity are then monitored during project execution and necessary actions are implemented in accordance with the project risk management plan.

### I.1.3 Types of Finance

The conventional types of finance for projects are equity and debt (Turner, 2007). In the context of infrastructure projects, public funds by the government are the third main source of finance (Eid, 2008). Turner (2007), Eid (2008) and Zahran and Ezeldin (2016) list the following as the most common types of finance.

- Public Financing
- Equity
- Debt (Loans)
- Grants
- Asset-backed Securities
- Guarantees
- Result-Based Grants or Loans

Turner (2007) highlights other less conventional and more innovative sources of finance such as leasing, switch trade, counter trade, forfaiting, debt/equity swapping, and Islamic finance. Turner (2007) also distinguishes between “Financing of Projects” and the term “Project Finance” which is used in the literature to describe a certain scheme of non recourse unsecured financing of projects (usually infrastructure), where the interest on debt and return on shareholders’ equity is paid off from project revenues.



#### I.1.4 International Finance Institutions and Other Sources of Finance

The main conventional sources of finance are shareholders who provide equity, banks that provide debt, and government general budget. Moreover, International Financial Institutions (IFIs) such as the World Bank, the African Development Bank, and the European Investment Bank play a major role in financing infrastructure projects in particular (Turner, 2007). Egypt relies heavily on IFIs as development partners not only to finance infrastructure development, but also to build the institutional capacity through technical assistance. This research focuses on the World Bank in particular and the instruments it offers for financing infrastructure projects.

## **I.2 Problem Statement**

The development of infrastructure lies at heart of Egypt's sustainable development strategy. With a portfolio of infrastructure projects for which the country is in dire need to be executed, there is a need to assess the current infrastructure funding schemes. IFIs provide funding instruments such as soft loans that are the least burdensome on developing countries' budgets. The IBRD as a member of the World Bank provides several alternatives for funding infrastructure projects. While the majority of large-scale infrastructure projects were funded through IPF in the past, with the recent introduction of P-for-R and the increasing number of P-for-R projects, there is a need to explore the optimum application of each instrument. The available literature that advises borrowing governments on the optimum selection between IPF and P-for-R is relatively scarce due to the novelty of the latter. In this research aims to address this gap and develop a framework that is oriented towards assisting the borrowing government in the selection between IPF and P-for-R for funding infrastructure projects, particularly in Egypt.

## **I.3 Objective**

The aim of this research is to develop a framework for the selection of the most suitable tool for financing any given infrastructure project in Egypt from the government perspective.

## **I.4 Methodology**

- Extensive review of the literature
  - Identify IFIs operating in Egypt
  - Identification of the criteria for selection of funding method
  - Establish a robust understanding of current World Bank lending instruments.
- Conducting structured interviews
  - Rank importance of selection criteria

- Explore risks associated with infrastructure projects in Egypt
- Explore how well does each World Bank instrument address infrastructure project risks
- Development of a framework for the selection of best-suited financing instrument for an infrastructure project in Egypt.
- Validation of the developed framework.

# Chapter II: Literature Review

---

## II.1 Infrastructure Projects

### II.1.1 Definition of Infrastructure

The term infrastructure is used to describe all public works that enable communities to function. Infrastructure includes roads, power plants, water structures, bridges, hospitals, schools, tunnels, etc. (Eid, 2008).

Prud'homme (2005) identified the following characteristics for infrastructure:

1. "Capital goods" or assets that are used to deliver a certain service and are not directly consumed
2. Designed to last for long periods, often decades.
3. They are often restricted to certain locations. Infrastructure services in a certain area of a country usually cannot serve other distant areas. This means that careful planning is needed to make sure the needs of each zone is addressed.
4. Governments usually interfere (to varying extents) in infrastructure services due to their strategic nature and their massive impact on citizens.
5. Infrastructure services are used by both households and industries, hence they might be a final service in itself or an intermediate service.

These characteristics describe "Economic Infrastructure" such as transport, energy, communications, and other utilities. While schools, hospitals, and sport facilities are defined as "Social Infrastructure".

### II.1.2 Infrastructure in Egypt

Egypt was ranked 118 out of 148 countries in terms of infrastructure (World Bank, 2015). Improvements in infrastructure are necessary to improve quality of life by

increasing access to basic services, create jobs, and encourage economic growth. The Government of Egypt plans to allocate EGP 135.4 Billion of the General State Budget for the fiscal year 2017/2018 for investments on its infrastructure (MoF, 2017).

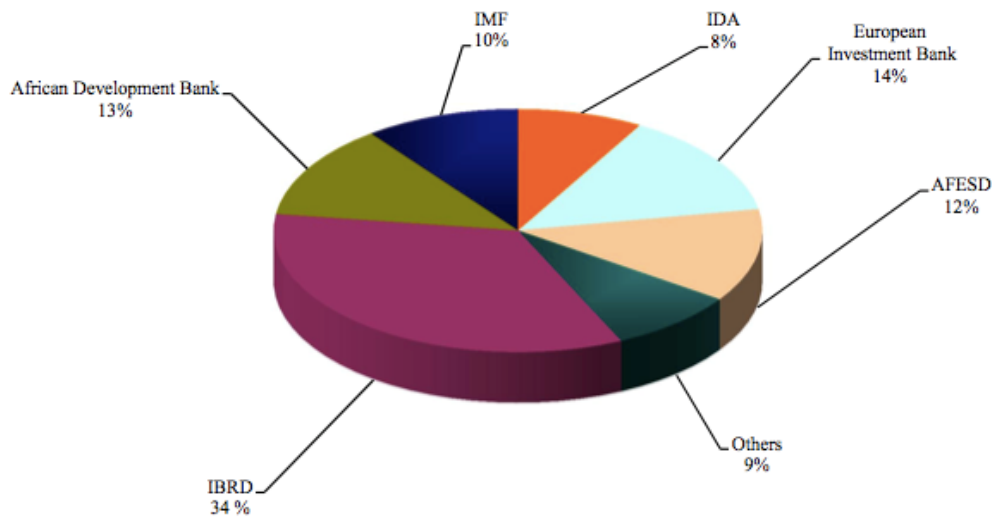
The development of Egypt's infrastructure is a cornerstone for the World Bank's Country Partnership Strategy with Egypt. The World Bank highlighted the following aspects as strategic priorities for sustainable development in Egypt:

- **Energy & Power:** there is a need to diversify the sources of energy by utilizing more sustainable renewable technologies. The expansion of energy infrastructure is a priority to reduce power outages and allow for industrial development
- **Healthcare:** The target is to cover the lowest 40% of the population with proper healthcare, with a focus on quality of health services.
- **Irrigation and Agriculture:** Food security is a major concern, in addition to the income and quality of life in Egyptian villages.
- **Wastewater and Sanitation:** The priority for this sector is to encourage decentralization and improve the capacity of implementing agencies. Improvements in wastewater management are vital for addressing water pollution issues.

## **II.2 International Financial Institutions Operating in Egypt**

The Egyptian government cooperates with several development partners in order to secure the necessary funds to develop the country's infrastructure. According to the Central Bank of Egypt quarterly report for the fiscal year 2014/2015, 25.5 % of Egypt's external debt is owed to multilateral international entities. The World Bank, African Development Bank group, and the European Investment Bank are the main

development banks contributing to these loans (CBE, 2015). This section sheds light on these entities (as well as some others) and the financial instruments that they provide for financing infrastructure projects.



**Figure 1: Medium and Long-term Public External Debt as of March 2015 -Multilateral Institutions (IBRD & IDA are subsidiaries of the World Bank) – Central Bank of Egypt External Debt Report Volume 49**

The review of the development banks and the financial products they offer revealed that these entities provide project finance alternatives that are similar to a great extent. These alternatives include project loan, grants, guarantees and some of these banks provide “Result-Based Finance”, which is relatively a novel approach to infrastructure project finance compared to other conventional methods.

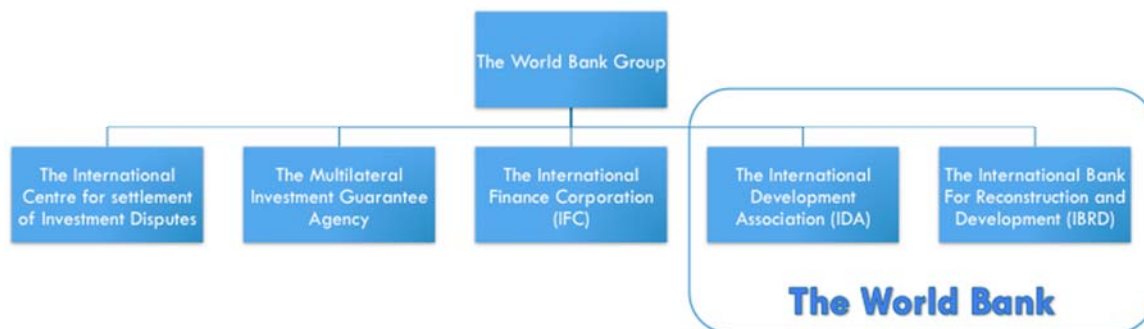
This research focuses on the finance methods provided by the World Bank, due to the significant volume of funds provided by the bank for infrastructure projects in Egypt to date compared to other entities. Also, the World Bank lending instruments appear to be representative of the available finance alternatives provided by other international development banks.

However, finance through the World Bank is not always available for every project, and no government can depend on one source of finance for all its strategic projects,

hence, the remainder of this section is dedicated for showcasing other similar entities that provide finance for infrastructure projects. A brief description for each entity and its financial services is provided.

### II.2.1 The World Bank

The World Bank Group was founded in 1944 following the Bretton Woods Conference in New Hampshire - along with the International Monetary Fund (IMF), with the purpose of reconstructing and development of post World War II world economy and restoration of international currencies value (Goldman, 2005). The World Bank current mission has reformed to eradicate poverty and to improve the developing nations' standards of living. The bank offers more than \$30 billion every year for developing countries. The bank's efforts include loans for tangible projects that are expected to help reduce poverty and improve quality of life for the citizens of developing countries, as well as fostering economic policies and reform measures that will support economic growth for its member countries (World Bank Information Center, 2017). The World Bank Group is composed of the International Finance Corporation (IFC), International Centre for Settlement of Investment Disputes (ICSID), Multilateral Investment Guarantee Agency (MIGA), the International Bank for Reconstruction and Development (IBRD), and the International Development Association (IDA). The below figure demonstrates the general composition of the World Bank group.



**Figure 2: The World Bank Group Composition**

The financial instruments provided by the IBRD in particular are the focus of this dissertation, namely; the Development Policy Finance (DPF), the Investment Project Finance (IPF), and the Program for Results (P-for-R). This is due to the obvious relevance of the tools provided by the IBRD to the to the finance of infrastructure project, in addition to the amount of finance provided by the IBRD to Egypt in comparison to other entities within the World Bank Group or otherwise.

### II.2.2 European Bank for Reconstruction Development (EBRD)

EBRD was created following the Cold War with the purpose of reconstructing East Europe economies and shifting these economies to open markets. The bank aims at fostering 'market-oriented economies and the promotion of private and entrepreneurial initiative'.

Since its establishment, the EBRD has supported 3833 projects with a total value of €252 billion. The capital of the bank has been raised through the contributions of more than 60 member countries and the European Investment Bank, as well as the European Union. The bank presently finances projects in more than 30 countries around the World (EBRD, 2016).



### **II.2.2.1 EBRD Finance Instruments**

#### **Loans**

EBRD focuses on private sector projects and provides finance within the range of €5 million to €250 million. Detailed loan conditions are customized to suit project specific circumstances and to meet client needs. However, there are general features of EBRD loans, which include the following:

- Loans are usually “Senior Loans” where the bank has a higher priority for repayment over other creditors
- It is common for loans to be Mezzanine or Convertible loans where the bank is allowed to convert debt to ownership/shares in the company/project.
- Repayment period ranges from 5 to 15 years and is usually on semi-annual basis
- Grace periods can be agreed upon
- Interest rates can be either fixed or variable
- Interest rates are based on the market prices
- Funding is up to 35% of the total project cost

#### **Equity Investments**

The bank has equity investments within the range of €2 million - €100 million in several sectors. There are several terms for such investments according to the each project’s nature and associated risks, but in all cases the bank never holds the majority of shares in a project nor does it take part in the direct management of any the financed projects. Also, the bank all bank investments are short-term in nature.

### **II.2.3 European Investment Bank**

The European Investment Bank (EIB) was founded by the European Union (EU) in 1958. Although the bank was created to serve the EU policies and to guard the

interests if EU member states, the bank provides funding for more than 150 countries outside of the Europe which makes up to 10% of the bank's funding budget (EIB, 2016).

### *II.2.3.1 EIB Finance Instruments*

#### Project Loans

EIB funds projects with budgets exceeding €25 million. Funding provided by the bank covers on average one third of the project supported but can reach up to 50% of the project cost.

The following are the general features of EIB project loans:

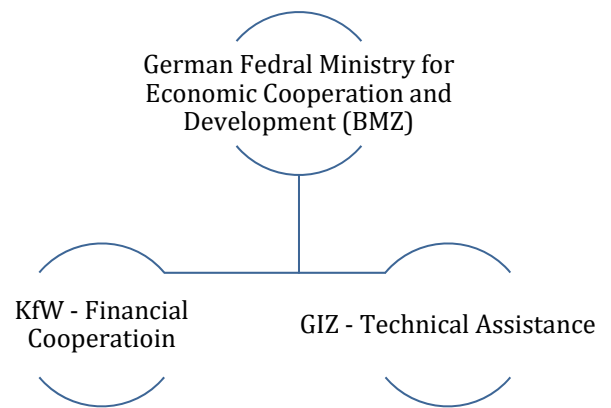
- The loan must match the bank's finance objectives
- The borrower has to prove that all financial, economical, technical and environmental aspects are addressed in his approach to the project
- Interest rates can be either fixed, variable or convertible
- Repayment by borrower can be either annual or semi-annual
- Grace periods might be granted for some projects

#### Other Instruments

In addition to traditional project loans, the bank provides finance through equity investments, smaller loans through financial intermediaries such as commercial banks, microfinance and venture capital investments. However, these instruments are designed mainly for projects with smaller scale.

#### II.2.4 Kreditanstalt für Wiederaufbau (KfW):

KfW is the main financial institution utilized by the German Federal Ministry for Economic Cooperation and Development (BMZ) in order to achieve its goals for the poverty eradication, preventing the destruction of the environment and promoting economic development. KfW works closely with the technical arm of the BMZ, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). Since its establishment in 1948, the KfW has contributed roughly 1 trillion euros to projects all over the world (KfW, 2016).



##### II.2.4.1 KfW Finance Instruments

- Development Loans

These are soft loans that are financed both by KfW's capital as well as the funds from the German government's budget. Development loans are provided at a discounted interest rate unlike other development banks such as EIB and EBRD, where interest rates are comparable to market prices.

- Promotional Loans

Launched in 2009, promotional loans are loans that are financed through the bank's capital with terms near to those of the market, often due to the lack of financing from commercial banks. Usually these projects are economically sound, and have well defined economic objectives, but are not able to access private financing due the long-term nature of the project.

- Grants

Grants are financed by the German government budget and they are reserved for the world's poorest underdeveloped nations. Developing countries can benefit from such grants if they prove that their projects contribute significantly to the cause of poverty eradication.

- Guarantees

Through this instrument, KfW accepts the transfer of risks that other lenders are unable to handle due to the complex nature of such risks such as political hazard. This tool can be used integrated with other financing tools to support the same project.

- Performance-based Payments

Performance-based payments were introduced by the KfW as a "Result-Based Financing" alternative to complement its project finance solutions. The aim of this tool is to lay more focus on results and outputs as opposed to traditional methods that focus mainly on inputs.

The table below shows the total commitments made by KfW in 2016, summarized per finance instrument.

**Table 1: KfW Commitments During 2016 (KfW, 2017)**

<b>Financial instrument</b>	<b>In m EUR</b>
Non-repayable financial contributions	1,817
Standard loans	92
Development loans	1,776
of which budget funds	30
of which KfW funds	1,745
Promotional loans	3,366
Delegated funds	239
<b>Total</b>	<b>7,290</b>

The below figure shows the distribution of KfW in 2016 contributions by region.

**Table 2: KfW Commitments by Region (KfW, 2017)**

	Budget funds		Total commitments	
	In m EUR	%	In m EUR	%
Sub-Saharan Africa	812	42	1,286	18
Asia and Oceania	325	17	2,783	38
Europe and Caucasus	136	7	873	12
Latin America	103	5	1,150	16
North Africa/Middle East	489	25	968	13
Supraregional	75	4	231	3
<b>Total</b>	<b>1,940</b>	<b>100</b>	<b>7,290</b>	<b>100</b>

## II.2.5 African Development Bank (AfDB)

Since its inception in 1963, the AfDB has been a major development partner for Egypt. The bank aims to support the economical and social development of the region. Members of the bank include 54 African countries as well as 26 non-African states as of the end of May 2015. The total capital of the bank amounted to \$100 billion on 2010 (AfDB, 2016).

### II.2.5.1 Lending Instruments

The AfDB works closely with the International Monetary Fund (IMF) and World Bank Group, consequently, these institutions played a major role in shaping the financial products offered by the AfDB. The following are the main financial products offered by the AfDB:

- Standard Loans

These are loans that are provided either at fixed or variable interest rate. This instrument is quite similar to the Investment Lending instrument offered by the World Bank.

- Structural Adjustment (SALs) and Sectorial Adjustment Loans (SECALs)

SALs and SECALs are lending instruments that link disbursements to policy adjustments and reforms in government sectors that are responsible for

development. These instruments are comparable to Development Policy Lending financial products offered by the World Bank.

The following table provides a brief comparison of the main development banks operating in Egypt and their financial services.

**Table 3: Comparison of Major Development Banks Operating in Egypt**

<b>Financing Entity</b>	<b>Main Sectors financed in Egypt</b>	<b>Range of Finance per project</b>	<b>Financial Products Offered</b>
<b>The World Bank</b>	<ul style="list-style-type: none"> <li>• Infrastructure Projects in most sectors are supported</li> </ul>	There are commitments for up to \$600 million for projects in Egypt	<ul style="list-style-type: none"> <li>• Development Policy Lending</li> <li>• Investment Lending (Project Loans)</li> <li>• P-for-R (Result-based lending)</li> </ul>
<b>EIB</b>	<ul style="list-style-type: none"> <li>• Power &amp; Energy</li> <li>• Transportation</li> <li>• Water Resource management</li> <li>• Waste Management</li> <li>• Urban Development</li> </ul>	Exceeding €25 million, Up to 50% of project cost, commitments up to €550 million have been made to projects in Egypt	<ul style="list-style-type: none"> <li>• Project Loans</li> <li>• Equity Investments</li> </ul>
<b>EBRD</b>	<ul style="list-style-type: none"> <li>• Power &amp; Energy</li> <li>• Transportation</li> </ul>	Up to €250 million	<ul style="list-style-type: none"> <li>• Project Loans</li> <li>• Equity Investments</li> </ul>
<b>AfDB</b>	<ul style="list-style-type: none"> <li>• Power &amp; Energy</li> <li>• Agriculture</li> <li>• Water Resource Management</li> <li>• Transportation</li> <li>• Health</li> </ul>	<ul style="list-style-type: none"> <li>• Several Loans exceeding \$500 million have been approved</li> </ul>	<ul style="list-style-type: none"> <li>• Project Loans</li> <li>• Structural Adjustment Loans (similar to World Bank DPL)</li> <li>• Sector Adjustment Loans (similar to World Bank DPL)</li> <li>• Result Based Finance</li> </ul>

## KfW

- Water Resource management
- Renewable Energies
- Education
- Finance can reach up to 50% of project cost
- Development Loans
- Promotional loans
- Guarantees
- Performance-based Payments (Result-based Finance)

### II.2.6 The Focus on the World Bank

Turner (2007) has identified three main criteria for the choice of the source of finance in large-scale projects; the size of the financial intermediary, experience in providing finance for projects of similar nature, and technical support this bank can offer with respect to the finance methods and financial planning. When considering these factors in particular, the World Bank would stand out as the most desirable partner to finance infrastructure projects, especially due to the bank's extensive experience with such projects. Accordingly, the World Bank was chosen as a subject of this research because of its importance as a leading IFI, and its significant contributions to development in Egypt.

## **II.3 The World Bank**

The prime mission of the World Bank is to “end extreme poverty” and to “promote shared prosperity”. Through its various subsidiaries, the bank partners with client countries in order to identify achievable sustainable development goals that would serve the Bank’s mission.

### **II.3.1 World Bank Composition and Background**

The World Bank Group is formed of the following five entities (World Bank, 2017):

- The International Bank For Reconstruction and Development (IBRD):

The IBRD is the oldest World Bank entity, it provides loans to “creditworthy” countries that are members of the bank and contribute to the bank’s capital stock.

- The International Development Association (IDA):

The IDA is the lending entity that integrates the mission of the IBRD, together they form the “World Bank”. The IDA serves the World Bank’s commitment to the poorest developing countries by providing “credits” (interest-free loans). IDA eligible countries do not meet the IBRD “creditworthy” criteria, however, they must also have low per capita incomes and they have to meet “performance” criteria set and monitored by the IDA. The World Bank estimates that IDA privileges cover 50% of the developing nations.

- The International Finance Corporation (IFC):

The IFC provides loans and equity finance for private sector business ventures in the developing world to stimulate the economic development of its countries. IFC also provides technical support for governments and private equities.

- The Multilateral Investment Guarantee Agency:

MIGA motivates foreign investments in developing countries through indemnifying investors against non-commercial risks that are more likely to occur in such countries.



- The International Centre for settlement of Investment Disputes

The ICSID aims to ameliorate the foreign investment environment by offering arbitration services and publications on foreign investment law.

### II.3.2 [The World Bank in Egypt](#)

The cooperation between the World Bank and the Egyptian government started as early as 1959, and since 1970, the World Bank has been constantly funding development projects in Egypt. As of October 2015, there are 33 active projects for the World Bank in Egypt, with a total lending cost of \$18.310 billion (World Bank, 2015).

The World Bank projects are dispersed over several sectors in alignment with the country’s “Country Assistance Strategy”. The following chart demonstrates the amount of finance provided by the bank in each sector, the amounts are summed for active projects in each sector.

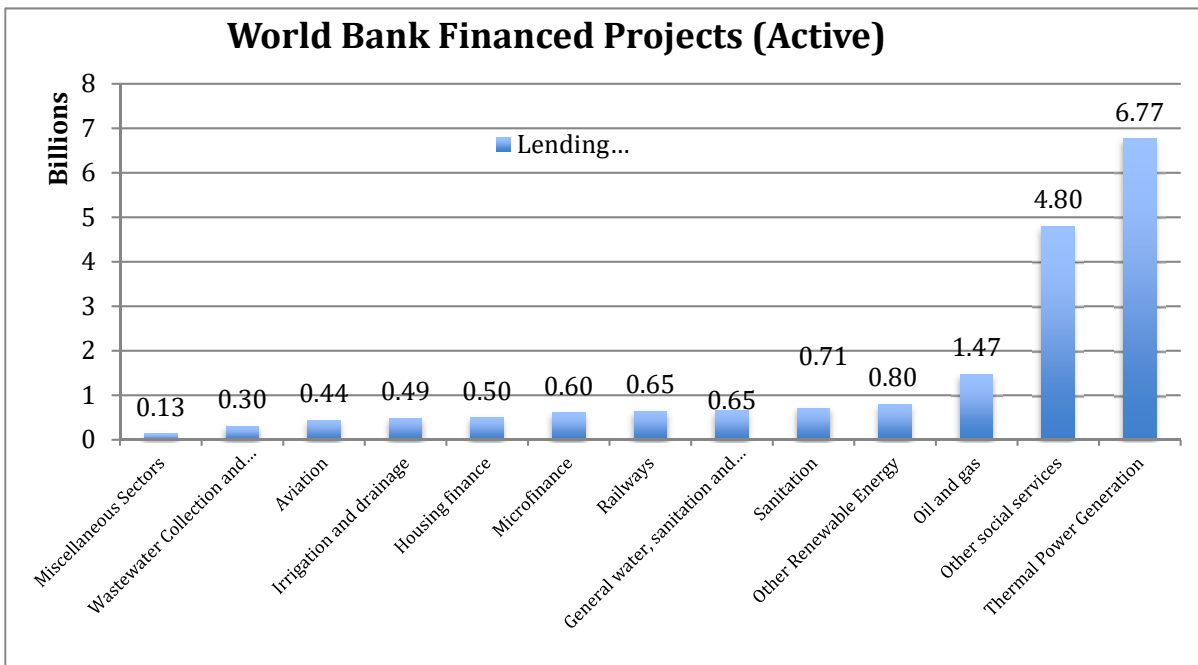


Figure 3: Active World Bank Projects in Egypt (World Bank, 2016)

Over the past years, Egypt has utilized the majority of the World Bank instruments to finance its development projects, the below table summarizes the total value of active loans approved under each instrument:

**Table 4: World Bank Loans to Egypt by Lending Instrument (World Bank, 2016)**

Lending Tool	Lending Cost (\$M)	% of total loans \$	Number of Projects	% of total loans (no)
Adaptable Program Loan	1.05	0.01%	1	3.03%
Emergency Recovery Loan	200.00	1.09%	1	3.03%
Financial Intermediary Loan	300.00	1.64%	1	3.03%
Investment Project Financing	6,390.22	34.90%	7	21.21%
Program-for-Results	1,000.00	5.46%	2	6.06%
Sector Investment and Maintenance Loan	654.15	3.57%	1	3.03%
Specific Investment Loan	9,752.27	53.26%	17	51.52%
Grants	12.32	0.07%	3	9.09%
<b>Grand Total</b>	<b>18,310.01</b>	<b>100%</b>	<b>33</b>	<b>100%</b>

As the above figure shows, the majority (whether by amount of finance or by number) of the World Bank Projects in Egypt have been financed through *Investment Project Financing and Specific Investment loans*. However, it is noteworthy that out of the 4 approved projects during 2015, 2 projects are being financed utilizing the new *Program-for-Results (P-for-R)* tool. The lending cost of the 2 P-for-R financed projects amount to \$1 billion out of the total \$1.405 billion worth of projects approved in 2015, which reveals the intention within the bank to rely on this tool heavily in the

near future. Moreover, out of the 6 projects that are pending approval of the bank 2 projects are to be financed through P-for-R.

### The Current trend for the World Bank's Involvement in Egypt

As figures show, the PforR instrument is expected to play a big role in financing infrastructure projects in Egypt. As of the end of October 2015, there are 2 approved P-for-R projects in Egypt, the Sustainable Rural Sanitation Services Program, and the Inclusive Housing Finance Program. Furthermore, there are 2 “pipeline” projects that are in the process of getting approved; the Healthcare Support Program (estimated \$200 Million cost to be fully funded by the bank), and the Finance for Rural Egypt program (estimated cost of \$1.19 Billion, \$500 Million of which to be funded by the bank).

### II.3.3 The World Bank “Project Cycle”

It is very important to establish an understanding of the way the World Bank tackles its projects starting from the concept stage and up to implementation. Such an understanding helps us better understand the factors affecting the approval process and the criteria for selecting the financial instrument. The “Project Cycle” is standard procedure followed by the World Bank to manage its projects stages including project identification, project appraisal and up to project execution and final evaluation. This section provides an overview of the different processes of the Project Cycle in order to develop a better understanding of the loan approval process (World Bank, 2017). It is important to note that this cycle is applicable to all types of World Bank funding instruments including IPF and P-for-R.

#### II.3.3.1 Key Stages

##### 1) Identification

During the project identification stage, the bank cooperates with the borrowing country in order to identify projects that would serve the country's strategic development goals that are outlined in the CAS. A task team from the bank consults with the borrowing country on developing the project/program concept. Several aspects are studied at this stage, and project scope, desired outputs, and lending instrument are identified. The "Project/Program Identification Document" (PID) is one of the main outcomes of this stage.

### 2) Preparation

After the bank and the borrower agree on the project concept, the borrowing country develops the project studies further including environmental, social and environmental aspects. These studies assist in shaping a clear and detailed project goals, components and execution plans. The bank task team concurrently examines the enabling conditions that would ensure the successful fulfillment of project objectives. In the case of PforR, defining the DLIs and exploring the possible mechanisms to monitor these indicators objectively becomes one of the main concerns of the preparation stage.

### 3) Appraisal

Once the borrowing country concludes all studies relevant to the project at hand. The bank launches an "appraisal mission" where the bank staff assesses and reviews all studies performed concerning the proposed project. The conclusions of the bank staff are summarized under the "Project Appraisal Document" (PAD), including the detailed economic, technical, fiduciary, risk assessments, and social & environmental assessments. For a PforR project, the task team holds "Decision Review Meetings" that decide on the achievability of the project results, the sufficiency of DLIs, and their measurability.

#### 4) Negotiations/Approval

At this stage, the borrower and the bank negotiate the loan terms and conditions, for a period that seldom exceeds 2 months. Afterwards, the PAD and the loan documents are presented to the Board of Executive Directors to review and approve the loan.

#### 5) Implementation

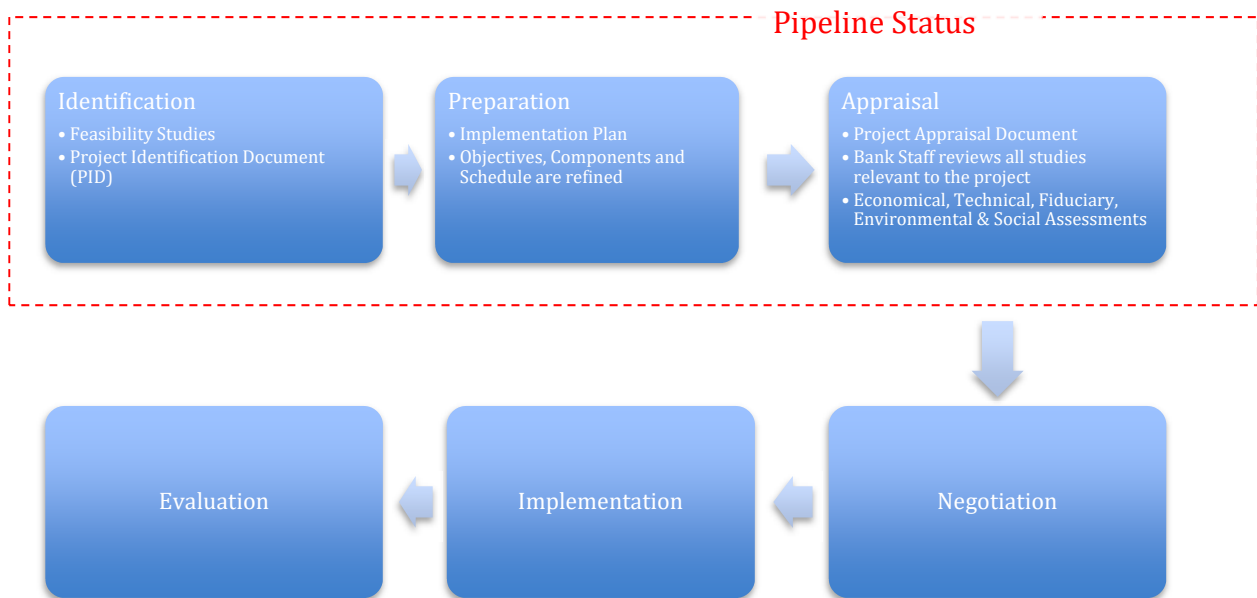
This is a country-led stage, where the borrowing country utilizes the approved loan amounts to execute the project. The bank's involvement in this stage is limited to monitoring the implementation project to ensure that the bank procurement procedures are being followed and that the loan terms and conditions are implemented.

#### 6) Evaluation

After the project is executed, the bank's Independent Evaluation Group (IEG), assesses the project outcomes and compares them to the intended objectives. The project completion report is reviewed and an independent audit report is issued as well.

#### "Pipeline" Status:

Throughout the Identification, Preparation, and Appraisal stages, the project is said to be "Pipeline". The appraisal stage is the bottleneck of the "Pipeline" status, the borrowing country thoroughly studies every aspect of the project in the preparation stage in order to pass the appraisal stage smoothly.



**Figure 4: The World Bank "Project Cycle" Flow Chart**

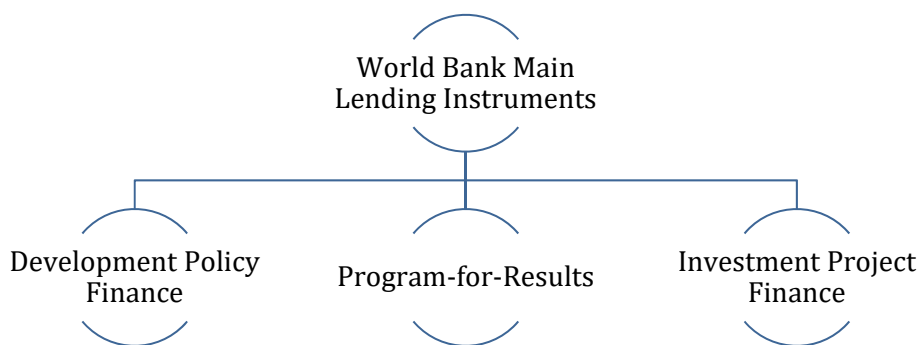
### ***II.3.3.2 Choice of Lending Instrument within the Project Cycle***

As far as the lending instrument is concerned, the borrowing country and the bank determine the optimal way to approach the project as early as the project identification stage. In the preparation stage, the country conducts several studies to ensure that the project is financially sound. Detailed loan terms and conditions are tackled in the preparation stage as well. If the country opts to apply for a P-for-R loan, the definition of DLIs and proposing reasonable measures to assess them becomes a significant aspect of the preparation stage, which can be considered further substantiation for the choice of P-for-R in this case. The rationale for the choice of instrument is reviewed and explained in the appraisal stage by the bank staff. By the end of the negotiation period and the at the time of signing all loan repayment terms are supposed to be finalized except fixed spread loans that are determined when the loan agreement is signed.

### II.3.4 The World Bank lending tools:

The World Bank offers a variety of lending services to serve the different nature and needs of its member countries. The lending instruments are divided into “Investment Lending” and “Development Policy lending”. The World Bank identifies the development and economic needs of each client country and prepares a customized “Country Assistance Strategy” (CAS) that comprises all lending programs and policies that are to be adapted in order to meet the development goals of these countries (World Bank, 2001).

A new addition to the World Bank lending instruments is the Program-for-Results (P-for-R), which was developed to fill the gap between Investment Lending and Development Policy Lending.



#### II.3.4.1 *Development Policy Finance*

Development Policy Finance (DPF) evolved from what was called “Adjustment Lending tools. DPL is the main tool used by the bank to support institutional and policy changes that are believed to be in favor of a country’s development. DPL are not

concerned with funding specific tangible infrastructure projects, hence they will not be the focus of this research.

#### ***II.3.4.2 Investment Project Finance:***

Investment Project Finance (IPF), previously known as “Investment Loans”, assists sustainable development in client countries by financing the enhancement of the infrastructure of these countries. Investment loans finance projects in an array of sectors whose development is vital for poverty reduction and the improvement of living standards.

Disbursement of investment loans is done against previously identified material, equipment, and any other goods and services that are required for the implementation of a project. Some loans are paid against certain components of projects.

Investment Lending consists of a number of lending instruments:

- Specific Investment Lending (SIL):

SILs support the construction, maintenance, upgrading of economic, social and institutional infrastructure. It is a flexible lending tool that is well suited for several projects. They are often used to address technical, economic, and financial difficulties face a specific investment.

- Sector Investment and Maintenance Loan (SIM):

SIMs are often used to support a public expenditure program that targets a specific sector, especially when a significant portion of projects in this program are financed by multilateral donors. The coordination of these joint efforts often proves burdensome in such cases. The purpose of SIMs is to assist client countries to implement their development policy regarding a specific sector. SIMs focus on “Capacity Building” of the borrowing institution and often includes agreements



concerning the structure of the investment programs and the reform policies to be adopted for the development of the target sector.

- Adaptable Program Loan (APL):

APLs finance multi-phase long-term programs that aim for the development of certain program. This instrument is most appropriate to be used when significant alterations in institutions, organizations, or behaviors are deemed necessary for the reform or restructuring of a certain sector. Usually, it takes time to convince the stakeholders involved in this sector of the benefits that they are to reap due to such adjustments. Thus, governments turn to phased long-term programs that consist of a series of projects. APLs provide support for such programs provided that the World Bank and the country's government agree on the following:

- The program that is subject to the loan
- Sector policies that are to be undertaken to complement the program.
- Priorities for investments that are to be made in that sector as part of the program

Each phase of the program launched after thorough analysis and evaluation is conducted for the preceding phase.

- Learning Innovation Loan (LIL):
- LILs were created to support pilot projects and new initiatives. The aim of such loans is to encourage new approaches and put them to the test before being implemented in large-scale projects or programs.

LILs are typically used to fund local development efforts and are most useful when funding is needed for pilot projects whose initial results are to be used for the planning and preparation of larger projects. Since “lessons learned” are the essence of

LILs, their success is often subject to the effectiveness of the monitoring and evaluation tools that are associated with the initiative or project supported.

- Technical Assistance Loan (TAL):

TALs is the tool that is concerned with “Institutional Capacity” building for the entities that are responsible for development projects in developing countries. These loans are often complementary to other investments, organizational adjustments and specific development projects for the same sector. Such forms of technical assistance provided by the World Bank contribute to the sustainability of the social and economic benefits realized from its projects.

- Financial Intermediary Loans (FIL):

Developments in the financial sector are the foundation for economic growth, also a strong financial sector ameliorates income distribution and reduces unemployment.

FILs is the tool used by the World Bank to support the development and reform of the financial sector and financial intermediaries in developing countries.

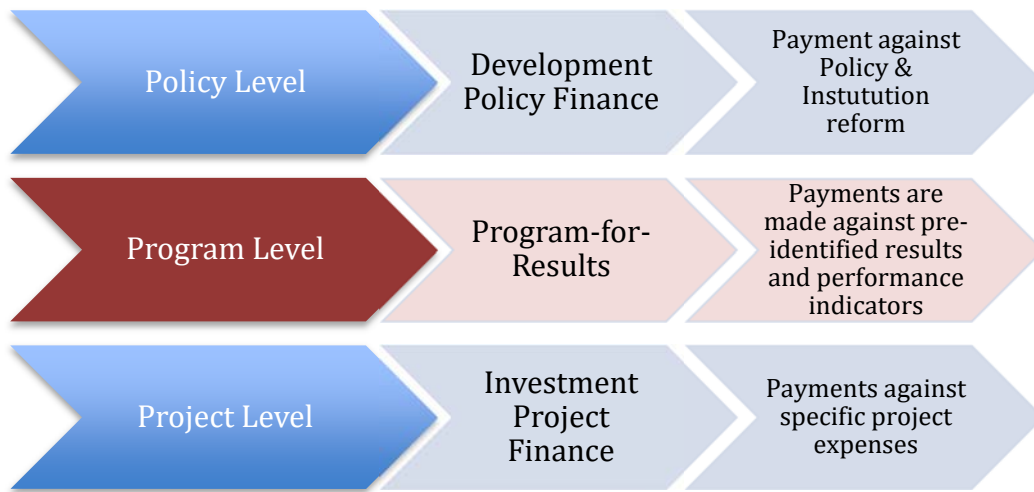
- Emergency Recovery Loan (ERL)

ERLs finance reconstruction and restoration efforts immediately following an unusual adverse event, provided that this event substantially impacted the borrowing country’s economy. Examples of such events are natural disasters, civil unrests and military conflicts. Due to the nature of these loans, the processing and disbursements of ERLs are relatively faster than other tools.

#### **II.3.4.3 Program-for-Results**

The Program-for-Results (P-for-R) was developed to address the gap between DPL that supports general policy adjustments and reform in certain economic sectors, and IL that provides specific project-level financing. P-for-R provides program level finance for client countries in order to meet their need to support government

programs whose results require both financing and capacity building for the government systems (World Bank, 2015).



The four main features of the P-for-R are as follows:

- P-for-R may support entire programs or sub-programs.
- Disbursements are made against pre-identified performance indicators and results, as opposed to IL where payment relies on whether or not expenses have been incurred.
- P-for-R places focus on capacity building and institutional strengthening, hence, making the achieved results more sustainable.
- P-for-R entails a number of extensive assessment and monitoring procedures that aim at assuring the proper use of bank financing.

#### Disbursement Linked Indicators (DLIs):

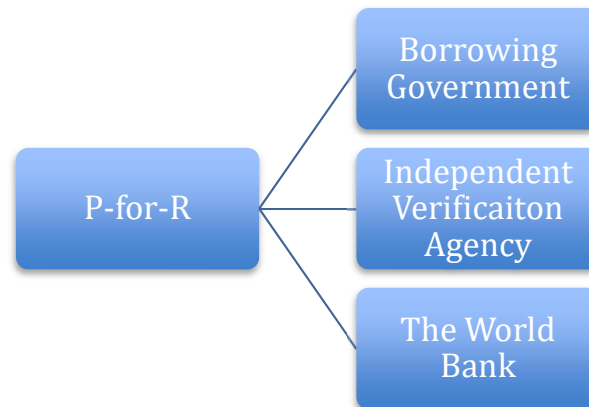
DLIs are considered the main pillar of the P-for-R instrument since they are the means to make bank's finance truly result-based. There is a wide range of indicators that can qualify as DLIs including service delivery indicators, institutional indicators or actions. However, the main categories of DLIs currently in use are indicators that measure the following:

- Specific program outcomes
- Participatory governance
- System improvements
- Access to services

DLIs must be measurable, scalable, achievable, related to project development objectives and addressing challenges usually faced in similar projects.

### Independent Verification Agencies (IVAs)

IVAs are an essential component for all output-based funding. The World Bank utilizes Independent Verification services for monitoring results and performance indicators in several projects, but in P-for-R IVAs are a key stakeholder the World Bank and the borrowing government.



**Figure 5: P-for-R Stakeholders**

The importance of IVAs stems from the fact that disbursement is linked to the verification of DLIs, hence the impartial assessment for the achievement of DLIs is vital for project success. IVAs for any given project must be of adequate capacity and of extensive experience relevant to the project.

In the project preparation stage, the World Bank works jointly with the borrowing government to establish the “DLI Verification Protocol”. It is important for this protocol to be consensual as it governs the disbursement of funds throughout the

project. The role of an IVA is to assess the achievement of project goals against the agreed Verification Protocol.

The World Bank defines the following as the essential components of any Verification Protocol:

- Definition of DLIs and the respective methods of measurement
- Extensive description of deliverables to be required for achievement
- Determining for each DLIs whether payments will be scalable
- Baseline data that will serve as a benchmark to measure the DLIs later on
- Expected time for achieving the DLIs
- The sources of data that will be relied on to confirm the achievement of DLIs

#### P-for-R Applications

PforR was developed to address development challenges that cannot be achieved just through policy adjustments or the successful implementation of a specific project. This instrument focuses on challenges that require capacity building, improvements in service provider and user behaviors, as well as policy actions or specific project investments. Examples of such challenges are rife especially in service delivery improvement programs; for example, improving the quality of education in developing countries requires both finance for new schools, and a change in the behavior of teachers and students to attend their classes. Also, financing new hospital projects can improve the access to healthcare, but this also requires proper training for medical staff in the health sector.

## **II.4 The Selection of the Most Suited Finance Method**

### II.4.1 World Bank Guidance on the Selection of Lending Method

While there is an abundance of sources explaining each World Bank lending instrument, there is considerably less literature providing guidelines for opting the

best-suited method for any given project. This section discusses the aspects that the World Bank considers for the choice of the proper financial instrument for any given project/program as outlined in the official bank policy documents for these instruments.

In the P-for-R concept note as well as the P-for-R 2 year review document, the World Bank explains each of the 3 bank main lending instruments and their uses.

<i>Category</i>	<i>Project support: IPF</i>	<i>Program support: PforR</i>	<i>Policy support: DPF</i>
Purpose	Supports specific investment operations	Supports government programs or subprograms	Supports policy and institutional actions
Disbursement mechanism	Disburses against specific expenditures that support the operation	Disburses upon achievement of results according to performance indicators	Disburses against policy and institutional actions
Implementation mechanisms	Bank IPF rules and procedures Funds for specific expenditures	Program systems Funds for specific expenditure programs	Country policy processes Non-earmarked funds for general budget support

**Figure 8 World Bank Lending Tools Comparison from the P-for-R 2-year review**

Under the “Use of P-for-R” section of the P-for-R concept note, the following conditions were identified for the suitability of the P-for-R tool:

- Expenditure is necessary for achieving project goals
- The borrowing government aims at achieving the project goals using its existing systems
- The main risk to the achievement of such goals relate to the institutional capacity of the relevant government bodies to accomplish the necessary outcomes

While the Investment Lending would be used if the project meets these criteria

- Main risks to be managed are related to the inputs

- The main challenges relate to the design and execution of the project
- Most of the expenditure involves the procurement of goods and services

Furthermore, the P-for-R concept note outlines the following aspects that have to be considered to assess the suitability of any given project for this instrument:

- CAS/CPS compatibility:

The bank would assess how exactly does the proposed program fit in the overall country's CPS and CAS, and whether the client country has adequate institutional capacity for this program.

- Scope of the program:

P-for-R can support either new or running projects, the scope covered by P-for-R also varies from entire sectors to small specific components of existing programs. Hence, the bank would determine whether the proposed scope is in harmony with the country development strategies.

- Challenges to achieving program outcomes:

As soon as the program and scope are deemed consistent with the country's CAS/CPS and development strategies, the bank goes on to identify the constraints to achieving the desired outcomes. This process would determine the suitability of P-for-R for financing the program and whether IL or DPL would be more appropriate in such case. IL instrument is generally used to finance projects where the control of inputs is required, and the main challenges are of technical nature. On the other hand, DPL is used when overcoming challenges necessitate institutional actions and policy adjustments. As for P-for-R, the challenges are

expected to be less technical and addressing such challenges would mainly rely on incentives and ensuring accountability.

- **Technical Assessment:**

The client country has to prove to the bank that their approach to address the development challenge at hand is technically sound. This would be done through demonstrating that the proposed approach capitalizes on similar experiences whether within the country or from other developing countries.

- **Institutional Capacity and Arrangements:**

The bank would evaluate the capacity of the country systems to perform the operations for which they seek client support. This assessment would contribute to the overall risk assessment of the project

- **Risk Assessment:**

Thorough assessment would be carried out for the risks associated with any given project. High-risk projects with that involve complex procurement packages and require corporate level reviews would typically be excluded from PforR finance. However, it is noteworthy that later documents on PforR such as the PforR Bank Policy and PforR Bank Directive define excluded activities more narrowly as “High-value Contracts”, with no reference to high-risk activities with the general sense of the term.

- **Social and Environmental Impact:**

The bank also evaluates any adverse environmental or social impact that might occur from the financed activities. P-for-R does not support any project that is potentially harmful to the environment or the stakeholders affected by the project operations.



It has to be noted that some of the mentioned conditions such as CAS/CPS compatibility, scope, and technical soundness are expected to be met by any finance instrument. On the other hand, institutional capacity, challenges to realizing project/program results, and exclusions from financing by any of the instruments are the three factors provided in the concept note document that would actually govern the decision to choose between IPF and PforR.

#### *II.4.1.1 Exclusions from PforR Financing*

According to the PforR Bank Directive and Bank Policy issued on July 2015, projects with possible serious unfavorable social or environmental repercussions are not to be financed by PforR.

Moreover, the aforementioned documents refer to “High-value Contracts” and indicate that such contracts are to be excluded from PforR financing. The bank directive defines high-value contracts as contracts with values higher than the threshold beyond which a review from the World Bank Operating Procurement Review Committee (OPRC) is mandatory. These threshold values are specified in the Bank Procedures BP11 Annex D, and they are subject to changes from time to time.

The following figure is extracted from the bank procedures and it provides the threshold for mandatory review by the OPRC as a function of the risk of the contract and type of contract.

Type of Procurement / Type of Contract	PS/PAS Thresholds	RPM Thresholds [1]				OPRC Thresholds [1]			
	Estimated Contract Cost in US Dollars (millions)	Estimated Contract Cost in US Dollars (million)				Estimated Contract Cost in US Dollars (million)			
		Low	Moderate	Substantial	High	Low	Moderate	Substantial	High
Works, Turnkey and S & I of Plant and Equipment		≥ 25 & < 200	≥ 25 & < 115	≥ 25 & < 75	≥ 25 & < 50	≥ 200	≥ 115	≥ 75	≥ 50
Goods	< 10	≥ 10 & < 125	≥ 10 & < 75	≥ 10 & < 50	≥ 10 & < 30	≥ 125	≥ 75	≥ 50	≥ 30
IT Systems, and Non-Consulting Services [2]	< 5	≥ 5 & < 100	≥ 5 & < 60	≥ 5 & < 40	≥ 5 & < 20	≥ 100	≥ 60	≥ 40	≥ 20
Consultant Services	< 3	≥ 3 & < 40	≥ 3 & < 30	≥ 3 & < 20	≥ 3 & < 15	≥ 40	≥ 30	≥ 20	≥ 15
All Direct Contracting and Single-Source Contracts with Consultants (Firms)	< 0.5 [3]	≥ 0.5 and upper threshold as per the type of procurement and corresponding thresholds above				As per the type of procurement and corresponding thresholds above			
Single-Source Contracts (Individual Consultants)	< 0.25 [4]	≥ 0.25 and upper threshold as per the Consultant Services thresholds above				As per the Consultant Services thresholds above			

Figure 9: Compulsory Prior Reviews by RPMs and OPRC, Bank Policy 11 Annex D

As shown in the figure, the threshold for compulsory review allows for higher contract costs for lower risk contracts. Procurement risk is assessed in this case following the bank's Procurement Risk Assessment & Management System (P-RAMS). It is noteworthy that the Bank Policy and Directive indicate that high-value contracts can be financed through PforR on two conditions:

- 1) If these contracts are vital for the integrity of the overall program financed.
- 2) The value of these contracts has to be less than 25% of the overall program budget.

It has to be noted that the exclusion from financing is limited to the specific project activities not the whole projects. Meaning that while the bank would normally refrain from financing high-value contracts or activities of considerable social and environmental risks through PforR, the rest of the project might still be eligible for PforR finance.

#### II.4.1.2 Exclusions from IPF Financing

The World Bank specifies a number of *legal, environmental, and social* safeguards that govern the use of the IPF instrument. The main applicable Safeguards are included in the following Operational Policies:

Table 5 : Applicable Safeguards on IPF instrument (World Bank, 2017)

Operation Policy	Description
OP 7.50	Excludes Projects on International Waterways
OP 7.60	Excludes Projects in disputed areas
OP 4.01	Excludes projects that contravene the borrower country's obligations under international agreements
OP 4.04	Prohibits the conversion or degradation of "critical natural habitats"
OP 4.09	Excludes projects using certain categories of pesticides under specified circumstances
OP 4.11	Excludes certain activities adversely affecting physical cultural resources
OP 4.12	Excludes involuntary land acquisition absent specified pre-conditions
OP 4.36	Prohibits significant conversion or degradation of critical forest area
OP 4.37	Concerned with the Safety of Dams

Himberg (2015) provides a comprehensive comparison between the safeguards and exclusions of the main IFIs, namely AfDB, ADB, EBRD, EIB, IDB, and the World Bank. The information provided on the World Bank is concerned with the IPF instrument in particular. The below is an extract from one of the extensive comparisons included in this report.

Theme	MDB	Coverage	Reference
Climate Change	WB	Yes	OP 4.01, footnote 5 and EHSs
	ADB	Yes	SR 1, Environment and EHSs
	IDB	Yes	OP-703, Environment and Safeguards Compliance Policy and OP-704, Disaster Risk Management
	AfDB	Yes	OS 1, Environmental and Social Assessment
	IFC	Yes	PS 1, Assessment and Management of Environmental and Social Risks; PS 3, Resource Efficiency and Pollution Prevention and EHSs
	EBRD	Yes	PR 1, Assessment and Management of Environmental and Social Impacts and Issues; PR 3, Resource Efficiency and Pollution Prevention and Control
	EIB	Yes	ESS 4, Climate Related Standards; other references in ESS 1 and ESS 3
Physical Cultural Resources and Heritage	WB	Yes	OP 4.11, Physical Cultural Resources
	ADB	Yes	SR 1, Environment
	IDB	Yes	OP-703, Environment and Safeguards Compliance Policy
	AfDB	Yes	OS 1, Environmental and Social Assessment
	IFC	Yes	PS 8, Cultural Heritage
	EBRD	Yes	PR 8, Cultural Heritage
	EIB	Yes	ESS 5, Cultural Heritage
Land Acquisition, Resettlement, Compensation and Tenure	WB	Yes	OP 4.12, Involuntary Resettlement
	ADB	Yes	SR 2, Involuntary Resettlement
	IDB	Yes	OP-710, Involuntary Resettlement
	AfDB	Yes	OS 2, Involuntary Resettlement, Land Acquisition, Population Displacement and Compensation
	IFC	Yes	PS 5, Land Acquisition, Involuntary Resettlement and Economic Displacement
	EBRD	Yes	PR 5, Land Acquisition, Involuntary Resettlement and Economic Displacement
	EIB	Yes	ESS 6, Involuntary Resettlement
Indigenous Peoples	WB	Yes	OP 4.10, Indigenous Peoples
	ADB	Yes	SR 3, Indigenous Peoples
	IDB	Yes	OP-765, Indigenous Peoples
	AfDB	Yes	OS 1, Environmental and Social Assessment <sup>110</sup>
		(limited)	

Figure 6: Extract from Comparison of IFIs Safeguard Policies by theme (Himberg,2015)

Comparisons provided by Himberg (2015) between the safeguards of the different IFIs would prove quite useful in case several IFIs are being considered for the finance of a certain project.

Therefore, it can be concluded that the World Bank limits the criteria for the selection of the proper instrument to the following aspects:

- Scope

- Project Nature
- Risks to the achievement of results
- Challenges to the achievement of project goals (capacity challenges or technical/resource challenges)
- Exclusions from any of instruments

The following table provides a summary for the considerations provided by official documents provided by the World Bank for the use of each of the lending instruments at study.

Aspect	Program for Results	Investment Lending
Scope	Programs or Sub-Programs	Projects
Risks	Risks related to the achievement of results given the current systems	Main risks to be managed are related to the inputs
Project Nature	The borrowing government aims at achieving the project goals using its existing systems	Most of the expenses involve the procurement of goods and services
Challenges	The main challenges to the achievement of such goals relate to the institutional capacity of the relevant government bodies to accomplish the necessary outcomes	The main challenges relate to the design and execution of the project
Exclusions	<ul style="list-style-type: none"> <li>• High-value contracts</li> <li>• Activities with possible adverse social or environmental effects (Category A risk projects)</li> </ul>	<ul style="list-style-type: none"> <li>• Investment Lending Safeguards</li> </ul>

Figure 10: Summary for Lending Instrument Selection Criteria as per official bank documents

## II.4.2 Literature on Finance Methods Selection

This section reviews relevant literature that discusses the criteria for the choice of financial instruments. The focus here is more inclined to academic research tackling the issue rather than official bank documents. Examining such literature provides a more complete picture for assessing the tools at hand through establishing a better understanding for the criteria offered by the bank policy, or even shed light on other criteria that can assist in the selection process.

### **II.4.2.1 Sources of Finance**

The two main types of finance are debt (loans) and equity (private or public). For large-scale projects, a mix of both finance types can be used to finance a single project (Venkataraman et al, 2011). Prior to addressing the question of the choice of lending method, the issue of what *portion* of the project is to be financed by debt should be tackled first. Turner (2007), Estache et al. (2015), Venkataraman et al (2011) all identified the Cost of Capital as the primary determinant for determining how much of the project would be financed by equity and how much would be financed through debt. In the context of large-scale infrastructure projects, the majority of the finance would be through loans because debt is generally cheaper than equity. However, lenders usually require a portion of the project to be financed by equity. This measure decreases the risk on the banks since debt is repaid ahead of equity, and this causes equity holders (whether the executing company or private investors) to exercise better management practices to protect their investments. The typical debt/equity ratio for infrastructure funded through project finance arrangements is 4:1, which is considered a high ratio comparison to the accepted ratios for regular firms (Turner, 2007).

Accordingly, the Cost of Capital - also referred to as the Weighted Average Cost of Capital (WACC)- ought to be optimized by determining the lowest cost combination of public funds, equity and debt. (Venkataraman et al, 2008) provides the following equation for determining the Cost of Capital:

$$\text{Cost of capital} = (\text{Ratio of equity} \times \text{Cost of Equity}) + (\text{Ratio of debt} \times \text{Cost of Debt})$$

Where Cost of Equity is the amount that would be paid from the project revenues as dividends to the equity holders, while Cost of Debt is simply the interest rate of the loan. (Turner, 2007) notes that cost of debt is considered in the taxed income, therefore, the Cost of Debt = Interest Rate  $\times$  (1 – Tax rate). Turner also notes that (Estache et al., 2015) considers Public/Government Funds in the cost of capital equation and explains the cost of public funds to be equal to the opportunity cost of such investment. Typically opportunity cost is calculated by estimating the additional taxes raised to finance the project. Hence, the equation becomes:

$$\text{Cost of Capital} = (\text{Ratio} \times \text{Cost of Equity}) + (\text{Ratio} \times \text{Cost of Debt}) + (\text{Ratio} \times \text{Cost of Public Funds})$$

Turner points out that the Capital Asset Pricing Model (CAPM) is often used to determine the cost of Equity to be

$$\text{Cost of Equity} = \text{Risk Free Rate of Return} + \text{Beta} \times \text{Equity Risk Premium}$$

Where the risk free rate of return is the lowest risk investment available such as government bonds, Beta in this context being the project specific risk, and the equity risk premium is the predicted additional returns from this equity investment.



### II.4.2.2 Financing Risks & Barriers: The Case of Renewable Energy Projects

A World Bank team headed by Hussain (2011) issued a paper and a web tool that aims to assist decision makers in choosing the appropriate financing method for funding Renewable Energy Technology (RET) projects in particular. The paper provides a brief description for each of the relevant finance methods, a long with the associated advantages and disadvantages of each method.

Although the paper focuses on infrastructure projects that relate to renewable energy, the findings of this research and the criteria adopted can be used for assessing finance options in other sectors. The study proposes that the selection between financial tools should be based on two criteria; the barriers for the project to access finance, and the risks associated with the project at hand. The paper identifies the financial barriers and risks that can be encountered by RET projects, and proposes a diagram that demonstrates which barriers and risks are addressed by each finance method.

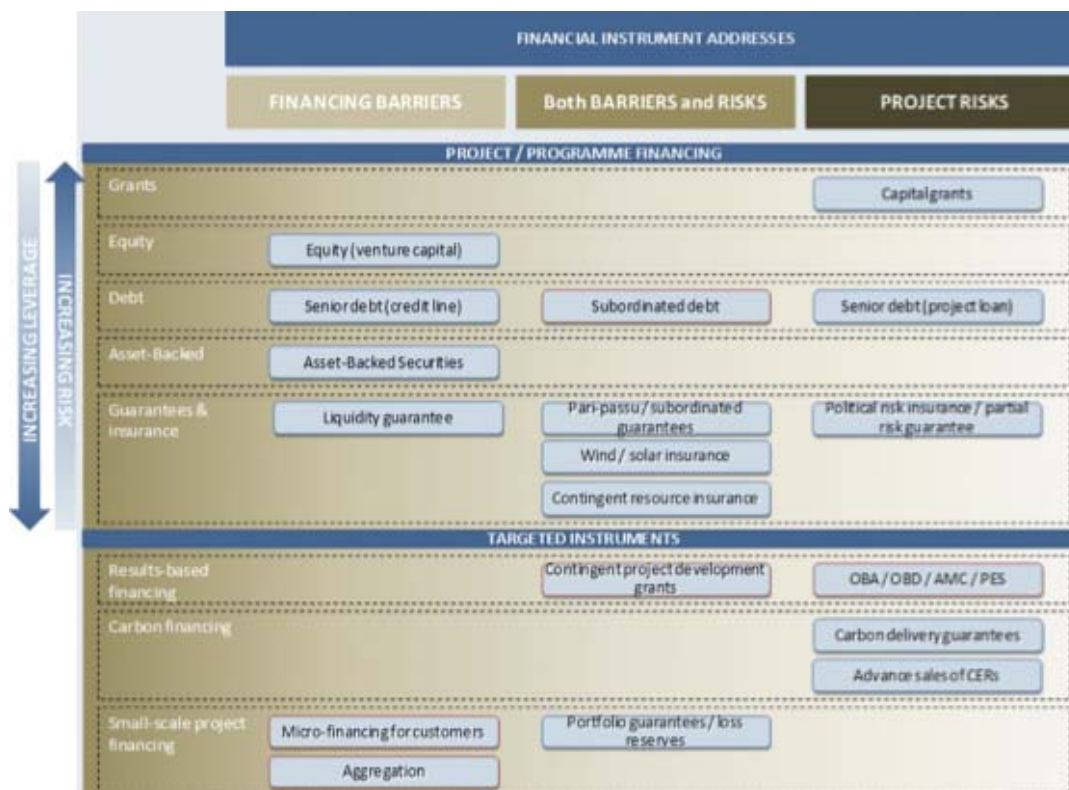


Figure 5: Financial Instrument vs. Risk/Barrier



The paper also introduces the concept of “Leverage” in the context of project finance. The Leverage measures the amount of extra funding induced by the loan. For an entity such as the World Bank, leverage would be an indicator for the efficiency of the bank’s lending. A high leverage ratio would mean that the bank is making more projects possible with less investment from the bank’s side. Accordingly, the following equation was derived in order to evaluate the leverage of any loan provided by the bank for any project.

$$\text{Leverage} = \frac{\text{Total Project Finance}}{\text{Public Funds (including Funds provided by the World Bank)}}$$

Furthermore, the study tool used 33 case studies to verify the link between the risks/barriers and each tool. Also, the case studies are utilized by developing the web tool to advise the user on the choice of finance, or provide him with the associated risks/barriers according to similar case studies (Hussain et al, 2011).

The study dedicates a chapter for the enabling environment that contributes to the success of the financial instruments including institutional capacity, planning and political framework, and support mechanisms. The study points out that institutional capacity challenges might in some cases direct policy makers to opt a certain instrument. The study generally recommends that entities with low institutional capacity should resort to finance methods that are simple to use in nature. The authors further argue that development efforts for governments with institutional capacities below a certain level should focus on capacity building first.

Hussain et al (2011) does not claim to propose one definite finance solution for any given project, nor do the authors believe it is possible. The authors also note that the nature and environment of each large-scale infrastructure project is unique, and chances are each project would be optimally financed through a combination of finance packages.

### II.4.2.3 Risks of financing a project

Yousefi et al (2015) identifies risk as one of the main criteria for the process of finance method selection. Yousefi argues that identifying project risks addressed by each finance method is among of the very first steps for assessing the available finance options. Yescombe (2002), Turner (2007) and Venkataraman et al (2008) indicate that studying risk and its allocation among the different project stakeholders is an important part of the financial feasibility study process. Risks categories that should be tackled according to Yescombe are macroeconomic, political, and commercial risks. Turner and Venkataraman provide the same categories as Yescombe, and include contractual risks under a separate category. The below figure extracted from Ventakaraman et al (2008) lists the four risk categories with corresponding examples for each category.

**Table 6: Financial Risks (Venkataraman et al, 2011)**

Type of Risk	Examples
Macroeconomic	Inflation, interest rates, currency and exchange rate fluctuations
Political	Country Risks, changes in laws and legislation.
Commercial	Feasibility, cost and schedule completion, revenue availability
Contractual	Management risks, equipment supply, license and sales agreements

Horcher (2011) identifies key financial risks including: foreign exchange, interest rate, commodity price, equity price, credit risk, liquidity, operational, and systematic risks. Furthermore, Horcher (2011) explains each of these risk categories and discusses the main elements of financial risk management along with the common strategies to tackle these risks.

Eid (2008) sheds light on risks associated with financing infrastructure projects in particular. The categorization Eid (2008) provides appears to be the most

comprehensive in the literature as it is not limited to financial risks as shown in the following table.

**Table 7: Infrastructure Project Risks, Eid (2008)**

<b>Risk Category</b>	<b>Risk Subcategories</b>
Commercial	Technical, Construction, Operation, Environmental, Risks of Input, Revenue Risks
Financial	Interest Rate Risk, Currency Risk, Equity Risk, Accounting & Economic Risk, Liquidity Risk, Bankruptcy Risk, Counterparty Risk, Refinancing Risk, Tax Risk
Country & Community acceptance	Expropriation, Riots, Currency Inconvertibility, Breach of Contract, Regulatory Risk, Arbitration Award Default, Community Acceptance, Lack of Experience
Force Majeure	War, Terrorist acts, Natural Disasters.
Other Sources	Infidelity and theft, Residual Value Risk (Lack of maintenance of facilities)

#### **II.4.2.4 World Bank Risk Framework for Operations**

The World Bank currently adopts the unified Risk Framework For Operations. The main pillar for this framework is the Systematic Operations Risk-rating Tool (SORT), which is used for the identification and evaluation of risks in its projects. This framework replaces the Operations Risk Assessment Framework (ORAF) in IPF and the Integrated Risk Assessment Framework (IRAF) in P-for-R. SORT comprises the following risk categories (World Bank 2016):

1. Political and Governance
2. Macroeconomic
3. Sector Strategies and Policies

4. Technical Design and Implementation
5. Institutional Capacity
6. Fiduciary
7. Environmental/Social
8. Stakeholders
9. Other.

It is important to note that the risk categories considered by the World Bank are broader than the risk classifications proposed in the literature tackling the finance of infrastructure projects that focus primarily on financial risks.

This research will utilize the risk categorization of SORT since the primary focus is on the World Bank financing mechanisms. However, the “Other” category will be used for Liquidity risks in order to orient the analysis more towards the borrower country’s perspective. The detailed explanation for each of these risk categories is included under Appendix I.

#### ***II.4.2.5 Approaches to the Selection of Finance Method***

Zahran and Ezeldin (2016) identifies project and country specific factors that influence the selection of finance instruments offered by International Finance Institutions (IFI). These factors include availability of funds within the IFIs, and the location/type of project with respect to the preferences of these IFIs, in addition to the borrowing country’s political status, market conditions and institutional capacity. Zahran and Ezeldin (2016) conducts an analysis for the general trends in infrastructure financing by each of the main IFIs with respect to location, infrastructure sector, and financing schemes. Such analysis might prove very useful for borrowing countries during the identification of the IFIs that are most likely to be interested in financing any given project.

Yousefi et al (2013) and Yousefi et al (2015) utilized surveys and interviews to identify the available finance alternatives and the decision-making criteria adopted by experts in Iran. Yousefi et al (2015) implemented the Analytic Hierarchy Process (AHP) to rank the various selection criteria based on the surveys conducted.

On the other hand, Yousefi et al (2013) suggest the use of the common Strengths, Weaknesses, Opportunities, and Threats analysis (SWOT) as a decision support tool. The study identifies the possible strengths, weaknesses, opportunities and risks that might be encountered by any infrastructure project in Iran according to the conducted surveys. The authors then develop possible strategies to seize opportunities and mitigate the project risks given the available strengths and weaknesses. The following figure shows general aspects that the authors consider in their proposed SWOT matrix analysis for infrastructure projects in Iran.

To sum-up, the available literature proposes the following criteria for considering available choices for financing any given infrastructure project:

- Cost of Finance
- Financial Barriers
- Financial Risks
- Institutional Capacity
- Leverage / Attraction of Private Investment

The remainder of this dissertation explores differences between the P-for-R and IPF with respect to each of these criteria. Also, this study seeks to assess the importance of each criterion with respect to the selection of finance instrument in Egypt.

# Chapter III: Methodology

## III.1 Research Strategy

The topic of optimum selection from the finance methods offered by the World Bank has not been discussed thoroughly in the literature, especially that one of these methods – the P-for-R – is relatively new. Accordingly, the research strategy adopted relies first on identifying the main themes relevant to the research objectives. Then the study moves on to analyze these themes through semi-structured interviews with industry experts. The outcome of these stages is a framework for the selection of the optimum finance instrument for a give infrastructure project in Egypt. The research strategy is demonstrated in the following figure.

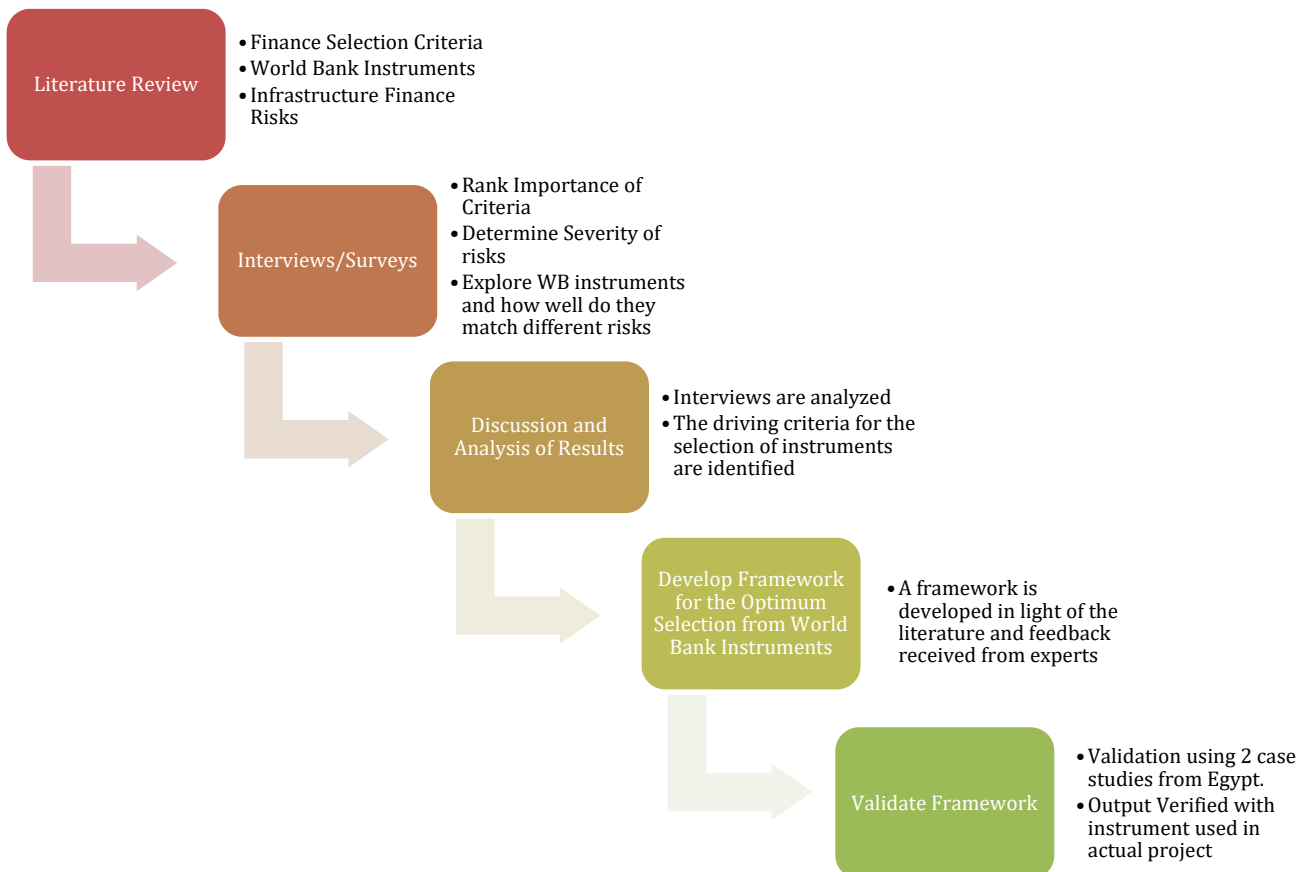


Figure 7: Research Methodology

## III.2 Research Methods

### III.2.1 Mixed Research Methods

This research employs the “exploratory sequential” research design which consists of two stages: first, the qualitative phase where the theoretical framework is built and the main aspects for tackling the research, and then the quantitative phase which capitalizes on the findings of the qualitative phase and attempts to quantify the variables and aspects defined in the previous phase. This approach is well suited to research projects that aim at devising new theoretical frameworks and defining/assessing variables (Creswell et. al, 2003). In this research, the qualitative data was collected through available literature and preliminary interviews in order to define the main themes of the theoretical framework that would be developed for the selection of finance instrument. In the second stage, the identified criteria are quantified through more extended and focused semi-structured interviews conducted with industry professionals.



Figure 8: Exploratory Sequential Research Design Processes

### III.2.2 Semi-Structured Interviews

The semi-structured interviews approach is quite similar to structured questionnaires in many ways. This approach is guided by a dominant research question and should be adequately structured to cover all research objectives. However, semi-structured



interviews start with open-ended questions that give room for the respondents to add to the understanding of the research topic, and then shifts gradually to more specific questions that address the research objectives directly. Moreover, this approach often allows respondents to elaborate on their answers and to explain certain aspects of their replies. This procedure results in much “reciprocity” and interaction between the design of the interview and the answers of the respondents (Galletta, 2013).

This approach is well suited to the nature of this research, which aims to define the main dimensions of a framework to address a problem that is not discussed thoroughly in the literature.

### **III.3 Interview Architecture**

#### **III.3.1 Interview Design & Questions**

The interview is divided into 4 sections, in the first section general data is obtained about the respondent’s background, experience and familiarity with World Bank instruments.

Following the first section, the respondent is briefed about the World Bank finance instruments since some of the respondents were not familiar with P-for-R in particular. Afterwards, experts were asked to provide their general feedback on the instruments and their advantages and disadvantages. The respondents provided their insights based on their experiences with World Bank financed projects, in addition to the main considerations related to financing projects in their respective sectors.

The second section titled “**Infrastructure Projects Financing**”, starts drawing the interview closer to the research objectives and comprises the following two questions:

1. Rate the importance of the following criteria for selection of an infrastructure project finance instrument: (1-5, 1:Least important → 5: Most important)

- a. Cost of Finance (Cost of Capital such as interest rate)
- b. Sector Financial Barriers (difficulties to access funding, ex: high initial cost, long payback period)
- c. Risks (addressed/caused by financial instrument)
- d. Leverage (to what extent does the lending instrument encourage private investment in the project)
- e. Loan Preparation Time
- f. Other (Specify)\_\_\_\_\_

Rate the following Risks in terms of probability of occurrence and impact in your sector: (Risk Categories are explained in detail in Appendix II)

Risk Categories	Rate the <b>probability*</b> of financial risk on projects in your sector					Rate the <b>impact*</b> of financial risk on projects in your sector			
		Low → High				Low → High			
	NA	L	M	S	H	L	M	S	H
Political and Governance	0	0	0	0	0	0	0	0	0
Macroeconomic	0	0	0	0	0	0	0	0	0
Sector Strategies and Policies	0	0	0	0	0	0	0	0	0
Technical Design for Project/Program	0	0	0	0	0	0	0	0	0
Institutional Capacity	0	0	0	0	0	0	0	0	0
Fiduciary (optimum use of funds)	0	0	0	0	0	0	0	0	0
Environmental and Social	0	0	0	0	0	0	0	0	0
Stakeholders	0	0	0	0	0	0	0	0	0
Liquidity Risk	0	0	0	0	0	0	0	0	0
Other (Specify): _____	0	0	0	0	0	0	0	0	0
Other (Specify): _____	0	0	0	0	0	0	0	0	0

**\* Probability**

L = Very low probability  
M = Moderate probability  
S = Substantial/High probability  
H = Very high probability

**\*\* Impact**

L = Low - Insignificant and would not necessitate any action  
M = Moderate - and can be addressed by routine mitigation measures  
S = Substantial - and has to be addressed by substantial mitigation measures  
H = Very High - and will affect project despite mitigation measures

The aim of this section is to determine the priority of the selection criteria that was proposed by the literature for the respondents in Egypt. Also, it aims to explore which

of the SORT risks are most relevant each sector. Respondents were given space to elaborate on their answers.

The third section titled “**Result-based Finance**” was devised from the early feedback of respondents on their experiences with P-for-R and the result-based financing schemes. The section includes the two following questions:

2. Does Result Based Finance add to project/program complexity?

Strongly Disagree       Disagree       Neutral       Agree       Strongly Agree

3. Does Result Based Finance effectively support capacity building?

Strongly Disagree       Disagree       Neutral       Agree       Strongly Agree

This section is an important addition to the interview since P-for-R is the new instrument that is far less addressed in the literature in comparison with conventional instruments such as IPF.

The fourth and final section titled “**The World Bank Lending Instruments**” narrows down the interview to address the research questions more directly. The following three questions under this section compare between the two World Bank instruments under study with special focus on risk.

4. Which of the following World Bank lending instruments would you expect to be more suitable for a project in your sector?

Investment Project Financing      Program for Results

5. Which of the following World Bank lending instruments would you expect to attract more private investments to your project?

Investment Project Financing      Program for Results      Type of instrument does not affect private investments      Sector does not target private investment

6. To what extent are the following risks addressed/worsened by each of the two instruments?

Risks	Investment Project Financing					Program for Results				
	Worsened → Addressed					Worsened → Addressed				
	1	2	3	4	5	1	2	3	4	5
Political and Governance	0	0	0	0	0	0	0	0	0	0
Macroeconomic	0	0	0	0	0	0	0	0	0	0
Sector Strategies and Policies	0	0	0	0	0	0	0	0	0	0
Technical Design for Project/Program	0	0	0	0	0	0	0	0	0	0
Institutional Capacity	0	0	0	0	0	0	0	0	0	0
Fiduciary (optimum use of funds)	0	0	0	0	0	0	0	0	0	0
Environmental and Social	0	0	0	0	0	0	0	0	0	0
Stakeholders	0	0	0	0	0	0	0	0	0	0
Liquidity Risk	0	0	0	0	0	0	0	0	0	0
Other (Specify): _____	0	0	0	0	0	0	0	0	0	0
Other (Specify): _____	0	0	0	0	0	0	0	0	0	0

- 1 = Risk is extremely exacerbated by this instrument choice
- 2 = Risk is somewhat worsened by this instrument
- 3 = Neutral- risk is not affected by either of the instrument types
- 4 = Risk is addressed by instrument
- 5 = Risk is fully mitigated through instrument

The purpose of Question 5 under this section is to verify the suitability of IPF and P-for-R for the sector of each respondent and to assess the general perception of professionals towards both instruments.

Question 6 was triggered by the low rankings of most interviewees for the importance of attraction of private investment as a criterion for the selection of lending instrument.

Finally, Question 7 compares how well does each of the two instruments address each of the SORT risks according to the respondents. This focus on associated and addressed risks was guided both by the literature and the answers of respondents.

### III.3.2 Sample Selection

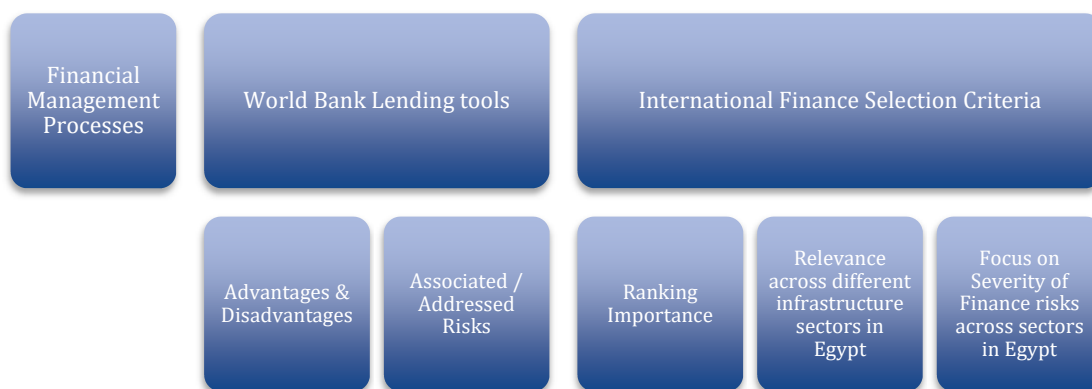
The purpose of the survey is to capture the insights of professionals with experience in infrastructure finance and incorporate their feedback in the developed framework. Considering the focus of this research which is the optimum selection from World Bank Lending tools, the respondents were chosen as senior management professionals with experience in IFI funded infrastructure projects. Unfortunately, there are limited number of professionals with experience in both IPF and P-for-R since the latter has been introduced to Egypt recently. Since there were only 3 active P-for-R projects in Egypt at the time of this research, and assuming 15 professionals are involved in the financial management process, the entire population of individuals relevant to the research can be estimated as maximum 45 professionals. In order to ensure a 95% confidence level at 20 confidence intervals, a minimum of 16 individuals should be interviewed. In this research 21 individuals were interviewed from both the World Bank and the governmental institutions sides.

## III.4 Analysis Techniques

### III.4.1 Qualitative Content Analysis

As previously discussed, this research starts with qualitative data to identify the main themes that govern the choice of lending instruments. The “Qualitative Content

Analysis” is an analysis technique to approach qualitative data that is particularly suited for exploring concepts that are not adequately tackled in the literature (Hesieh et al. 2005). As previously explained, this study allows the respondents to elaborate on their answers and offer any insights they might have on different aspects of the research. Accordingly, the Qualitative Content Analysis technique was needed to systematically address these elaborations from the respondents and draw conclusions that can be utilized in the development of the framework. This method of analysis depends on creating a “Coding Frame” that consists of main categories that are further divided into two or more subcategories. There are different variations of the content analysis method, the main structure of the coding frame can be “Concept-driven” from the literature or derived from the answers of the respondents. The data obtained from the interviews is then “segmented” and matched to the categories of the coding frame previously developed. Once the coding step is over, the data is already grouped in a manner that makes identifying the patterns and analysis much easier (Schreier, 2014). The following figure shows the coding frame created to analyze the qualitative data collected in the first phase of this research.



**Figure 9: Qualitative Content Analysis Coding Frame**

### III.4.2 Quantitative & Statistical Analysis

After the main themes in the theoretical framework are identified using qualitative analysis, these themes are further explored through semi-structured interviews to assess the importance of each of the identified criteria and its effect on the choice of finance instrument. In order to perform this analysis on a quantitative manner, rankings and scores are obtained from each expert, and the distribution of these answers and their statistical characteristics such as the mean and standard deviation is analyzed. The statistical analysis for this research was aided by “Real Statistics Resource Pack software (Release 5.1)” for Excel (*Copyright Charles Zaiontz, 2013 – 2017*).

#### **III.4.2.1 Likert Scale**

A 5-point Likert Scale was used in the interviews for ranking the feedback of experts on various aspects of the research. The reason this scale was adopted is its prevalence in the literature, in addition to the fact that it allows the respondent to provide neutral answers or express certain inclinations with varying extents. This is important to the nature of this study in order to assess the relevance of each factor to the research objective.

#### **III.4.2.2 Severity of Risks**

One of the main research themes identified is the risks associated with infrastructure projects in Egypt. In order to assess the severity of each risk across the different infrastructure sectors, the probability of each risk and its impact are obtained from each respondent are multiplied.

#### **III.4.2.3 Statistical Significance**

Following the analysis of interview results, the statistical significance of these results are tested to identify which of these results should be the driving factors for the

selection of finance instrument. The Mann-Whitney U-test was performed on the expert ranking of risks. Rankings with P-value less than 0.05 were considered statistically significant (Nachar, 2008).

#### III.4.2.4 Logistic Regression

One of the main themes of this research is to explore how well does each World Bank lending instrument address each standard SORT risk. Respondents were asked to rank the performance of each instrument with respect to each risk. There was a need to transform these rankings in to a tool that would establish a link between these rankings and the choice of instrument, this tool can then be used to reverse the process; it can be used to determine which tool is better suited to address a certain group of risks.

The tool chosen for that purpose was a logistic regression model. Logistic regression is well suited to develop models that are design to predict one of two outputs. The output of the regression equation ranges from 0 to 1, accordingly if the output is closer to 0 the prediction becomes what 0 denotes and vice versa (Sainani, 2014).

The generic logistic regression equation is:

$$\text{Log} \left( \frac{\pi}{1 - \pi} \right) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9$$

After rearrangement to make  $\pi$  the subject of the formula, it becomes :

$$\pi = \frac{\exp(\alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9)}{1 + \exp(\alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9)}$$

$\alpha$ : intercept (to be obtained from the logistic regression)

$\beta_1$ : coefficient of first parameter (to be obtained from the logistic regression)

$X_1$ : Risk #1 (parameter #1) → the user inputs those

Risks are as per the following numbering:

$X_1$	Political and Governance
-------	--------------------------



X <sub>2</sub>	Macroeconomic
X <sub>3</sub>	Sector Strategies/Policies
X <sub>4</sub>	Technical Design/implement
X <sub>5</sub>	Institutional Capacity
X <sub>6</sub>	Fiduciary Risk
X <sub>7</sub>	Environmental/Social
X <sub>8</sub>	Stakeholders
X <sub>9</sub>	Liquidity

The result  $\pi$  is between 0 and 1 while the cutoff is 0.5, if  $\pi$  turns out to be less than 0.5, then the model has favored IPF. If  $\pi$  is more than 0.5, then the regression model recommended the P-for-R

#### III.4.3 [Validation](#)

The validation process for the developed framework was done using 2 case studies of infrastructure projects in Egypt. The output of these case studies was verified by the actual method used in the project and the success of this method as reflected in the World Bank implementation reports.

The Output was further validated by comparing the output with the general trend in this sector worldwide and by comparing this output with previous projects within sector.

# Chapter IV: Results and Analysis

## IV.1 Interview Demographics

21 professionals were interviewed for the purpose of this research, all of which with thorough experience in internationally financed infrastructure projects in Egypt.

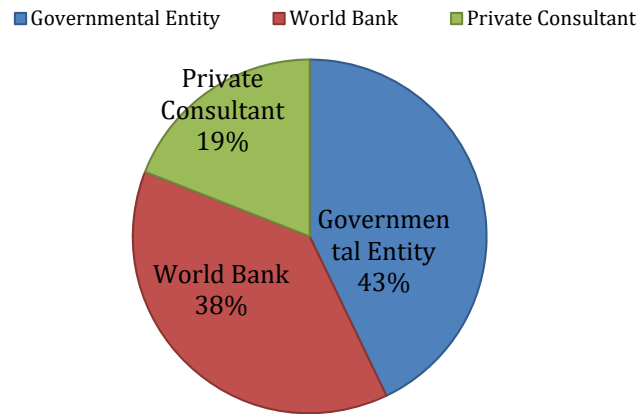
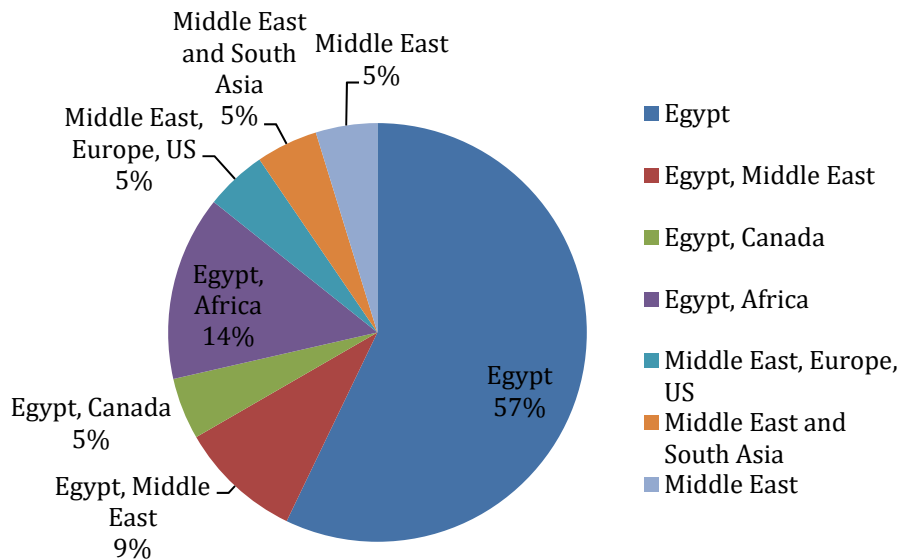


Figure 10: Categories of respondents

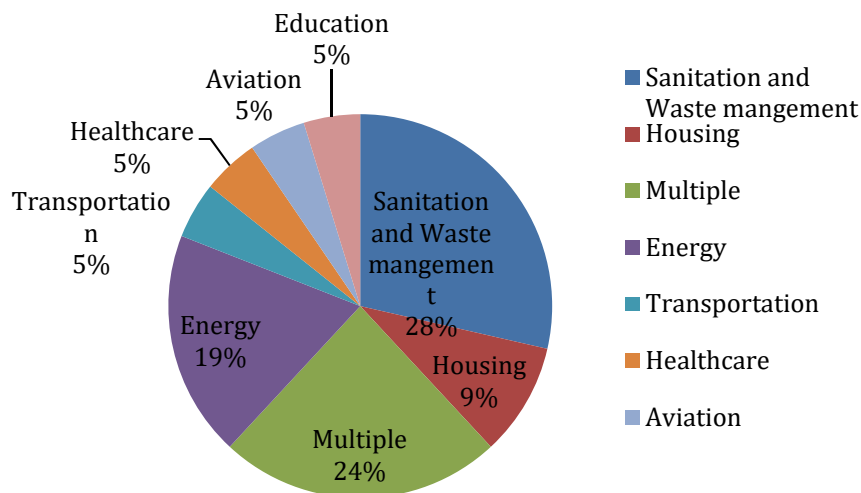
As shown in the above figure the sample is balanced to represent professionals from the World Bank, the Government of Egypt and private independent consultants involved in World Bank projects. This balance was intentional to ensure that the feedback captures the World Bank perspective while it is still well oriented towards the borrowing government's mindset.

The experience of the respondents is mainly relevant to Egypt, however 43% of the respondents were exposed to infrastructure projects on the regional and international level as shown in the below figure.



**Figure 11: Geographical Distribution of Experience for the Sample**

Another aspect that was considered as much as possible was the diversity of sectors the interviewed experts have worked on. The below figure shows the classification of the interviewed sample by sector, it can be noticed that certain sectors are overrepresented due to the increased involvement of the World Bank in these sectors.



**Figure 12: Classification of Interviewed Sample per Sector**

The experience of the respondents in IFI financed large-scale infrastructure projects ranges from 4 to 30 years with an average of 15.5 years of experience. The average number of IFI funded projects they were involved in is 9.75. Accordingly, it can be

deduced that the respondents have an adequate experience to provide credible feedback to address the research questions.

■ 25 yrs or more ■ 15 to 24 yrs ■ 10 to 14 yrs ■ 5 to 9 yrs

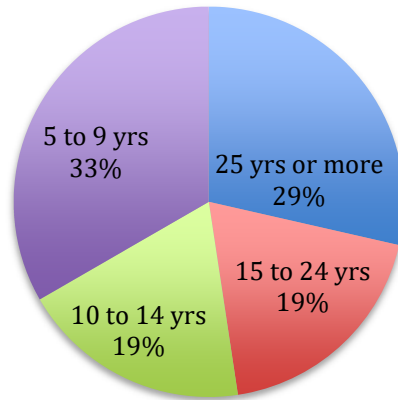


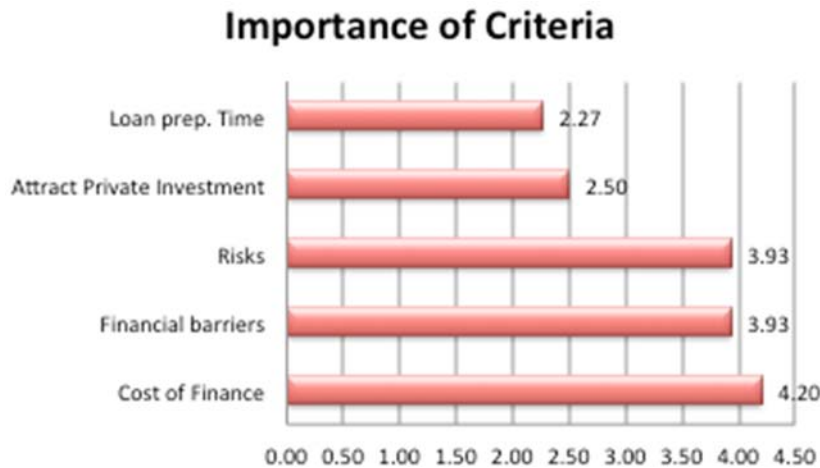
Figure 13: Years of Experience of Respondents

## IV.2 Ranking of Selection Criteria

### IV.2.1 Cost of Finance

As demonstrated in Figure 3 responses to the first question showed that cost of finance is considered the most important factor in the decision of the finance instrument. Governments seek financing for infrastructure projects from International Finance Institutions such as the World Bank as their first choice because these entities generally provide the least costly financing schemes for development projects. International Finance Institutions usually offer grants or “Soft Loans” that have low interest rates and long repayment periods in comparison with commercial banks. It is important to note that there is no apparent difference between P-for-R and IPF with respect to the cost of finance. World Bank professionals indicated that negotiations on the financial terms take place at the final stage prior to loan approval after the instrument is already determined. These negotiations settle financial terms such as interest rates, payback period, and whether the loan is “Commitment-linked”

or “Disbursement-linked”. For commitment-linked loans, the repayment schedule begins at the time the commitment is made by the bank. While, disbursement-linked loans are linked to the actual time payments are made to the borrower, which might be later than originally planned.



**Figure 3: Average Rating of Respondents for the Importance of each Selection Criteria**

#### IV.2.2 [Financial Barriers](#)

The respondents ranked financial barriers as the second most important criterion. Professionals specializing in Energy and Healthcare identified the need of massive upfront financing in the majority of the projects in their sectors as a major financial barrier. Projects in these sectors often involve expensive equipment procurement contracts before any significant results are achieved. Accordingly, these projects cannot rely solely on P-for-R which disburses primarily against results, and the maximum advance payment it can provide is 25% of the loan amount. However, respondents have noted that the design of the P-for-R can include up to 25% “Soft” DLIs such as the formation of Project Management Units (PMUs) or conducting certain capacity building measures. These soft DLIs usually do not require major spending

from the implementing agencies and can be financed through the local component of finance.

Another barrier that was highlighted by several respondents was the inability of the governments in many instances to provide the local component of the project budget. Usually the World Bank prefers that the borrowing governments contribute to the financing of projects to maximize the sense of ownership to the project and increase efficiency in using funds. However, several respondents have noted that some ministries perform general “line budgeting” for their operations as opposed to “programmatic budgeting” that allocates funds to certain projects. As result, the implementing agencies sometimes fail to obtain the local component of the finance that was supposed to be provided by the government. Some professionals speculate that a tool such P-for-R can utilize DLIs to ensure sound budgeting practices by the implementing agencies and ensure the availability of local funds.

#### IV.2.3 Risks Addressed/Caused by Instrument

Project risks and the risks associated with financial instruments also scored the second highest average value for the importance as a criterion for selection (same as financial barriers).

While cost of finance and financial barriers stand out as key elements in the selection of financial instruments in general, studying associated and addressed risks by P-for-R and IPF appear to be a primary factor in the deciding between both instruments. This is due to the fact that both instruments are quite similar in the cost of finance, while the suitability each of the instruments with respect to project financial barriers is rather deterministic. Accordingly, this factor is discussed in detail in questions 2 and 7, and will be a pivotal element in the framework for the selection of optimum instrument.

#### **4.1.1. Leverage (Attraction of Private Investment)**

Notably, the average rating for the importance of attracting private investment was only 2.5. This outcome contrasts the prevailing literature that indicates that the involvement private sector usually enhances efficiency which is in line with the global trend to involve private investments in the finance of infrastructure projects. The reasons behind this low ranking for this criterion is explored further in the analysis of question 6

#### **IV.2.4 Loan Preparation time**

The least important factor according to the respondents was the time consumed in the loan preparation process. Loan preparation time appears to be similar in most financial institutions that are of the same nature.

#### **IV.2.5 Other Important Criteria**

Respondents involved in the Energy and Healthcare sector pointed out that the ability to formulate practical and scalable DLIs is a major criterion in the case of selection between World Bank instruments.

### **IV.3 Risks Associated with Infrastructure Projects in Egypt**

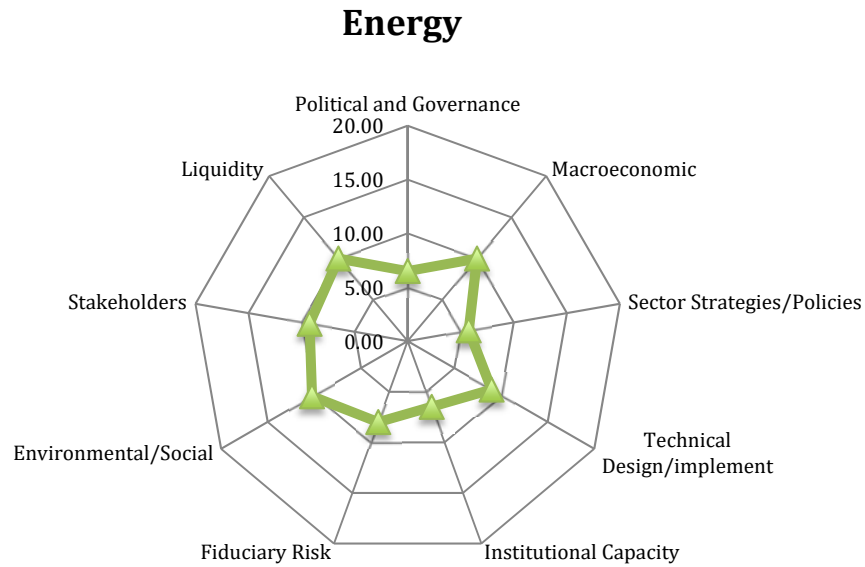
The fourth question in the survey explores the different risks associated with various infrastructure sectors in Egypt. Macroeconomic and Political & Governance risks were identified as key risks in all infrastructure project which is predictable due to the country's current political situation and recent economic policies including the currency devaluation and changes tax law. The literature and guidance provided by the World Bank identify Development Project Finance as the tool of choice for dealing with Macroeconomic and Political risks. However some of the respondents believe that P-for-R can be utilized to address such risks on a certain infrastructure sector.

#### IV.3.1 Energy

Several professionals with experience in non-renewable energy projects were interviewed. The sector professionals identified Environmental/Social, Liquidity, Macroeconomic, Stakeholders and Technical Design & Implementation risks as the main risks to delivery within the sector. Environmental/Social and Stakeholder risks are inherent risks in sectors in most infrastructure sectors due to adverse impact of such projects on the environment and the probability of expropriation of lands for the connection of services through pipelines or transmission lines. Both cases are particularly relevant in most energy projects involving power generation stations or connection of services to households. Another significant challenge faced by energy projects is the massive investments these projects require, this poses substantial liquidity risks on projects especially in earlier stages. Technical Design & Implementation risks have been also highlighted as one of the main challenges relevant to this sector due to the complicated technical nature of these projects.

Respondents working for both the World Bank and the GoE have identified the energy sector as one of leading sectors in Egypt in terms of the capacity of relevant government entities, in addition to the clarity of sector strategies and their consistency with the sector development strategies. Accordingly, the sector is less prone to Institutional Capacity, Sector Strategies/Policies, and Political & Governance risks.





**Figure 14: Risk Categories Severities for the Energy Sector**

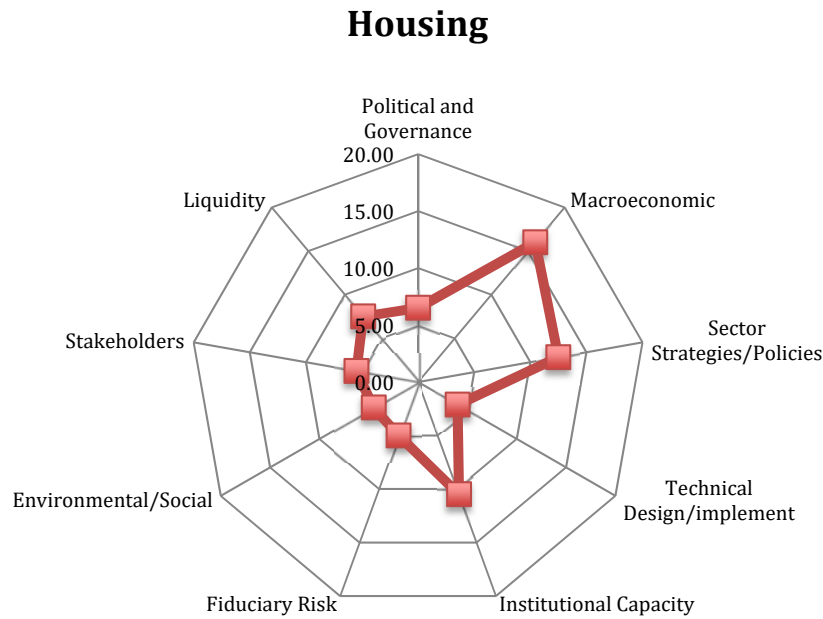
Figure 5 above demonstrates the severity of the various risk categories with respect to energy infrastructure projects. The overall risk profile for the sector shows that the main challenges lie in the control of inputs and management environmental and social impacts.

#### IV.3.2 Housing

Macroeconomic, Sector Strategies & Policies, Institutional Capacity risks were identified as the main risks relevant to this sector. World Bank professionals explained that the housing sector is the most vulnerable to macroeconomic risks because the cost of access to housing is more burdensome on citizens in comparison with any other infrastructure service. There is a consensus among respondents that the strategies that were previously adopted by the sector do not adequately address the inherent risks within the sector. For Example, one of the trends in housing

projects was to provide “supply-side subsidies” for contractors to ensure to provide affordable housing units for low-income citizens. However, this policy was inefficient as controlling the actual prices for which the units were being sold has proven to be quite a complex task. Professionals have further explained that there has been a shift in the sector policies towards “demand-side” subsidies, this shift was first featured in the “Takafol & Karamah” or “Inclusive Housing Finance Program” project which is a P-for-R project. The apparent inability to formulate sound and efficient sector strategies leads to another risk, which is the lack of Institutional Capacity. Institutional Capacity is yet another risk that was identified as a challenge to meeting the housing sector’s development goals. Experts stated that such risk is often being tackled by seeking Technical Assistance Loans from development banks such as the World Bank that would augment the financial loan supporting the sector’s projects.

On other hand, the interviews revealed that housing projects are less prone to Technical Design and Implementation, Liquidity, Environmental and Social, and Stakeholders risks. The evaluation of the Technical Design and Implementation risk is significantly less in housing projects in comparison with other infrastructure sectors due to the nature of housing projects that normally does not involve any high technologies in implementation. Contrary to most infrastructure sectors, experts did not rank Stakeholders and Environmental risks as a top risk in housing projects. This is explained by the limited expropriation of lands from citizens who are not direct beneficiaries form the project, which usually boosts Stakeholders and Social risks in projects involving infrastructure networks. Moreover, the nature of housing projects does not involve irreversible adverse environmental effects that cannot be contained or mitigated.



**Figure 15: Risk Categories Severities for the Housing Sector**

Figure 6 above reveals that the risk in the housing sector is clearly concentrated in Institutional Capacity, Sector Strategies, and Macroeconomic risks. These risks are interdependent to a great extent and they do not relate to the capacity to achieve results given the availability of resources and efficient control of inputs.

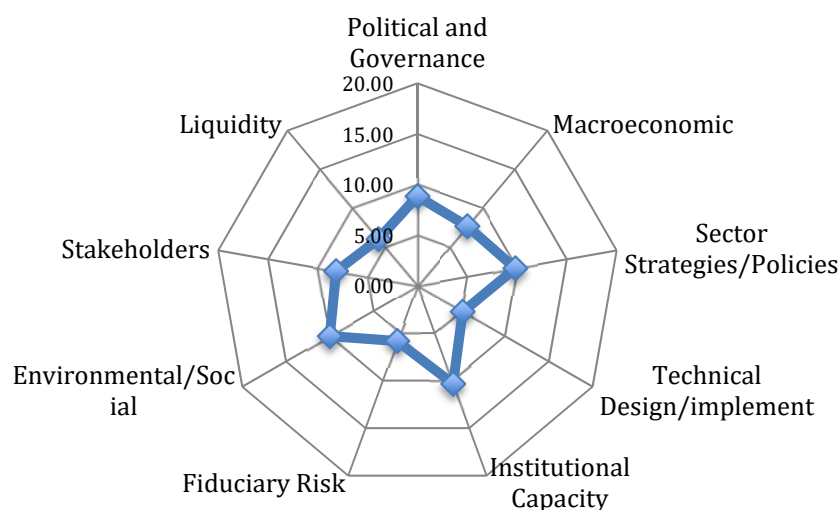
#### IV.3.3 Sanitation and Waste management

Experts involved in Sanitation and Waste management projects have identified Institutional Capacity, Environmental Risks, and Sector Strategies as the most severe risks encountered by projects in this sector and have already caused several projects to fall short of their objectives. It is noteworthy that the sanitation sector is of special nature since there are two major recent World Bank IPF projects executed within the sector and the implementation of a P-for-R project has already commenced. The overall evaluations for the two IPF projects have been unsatisfactory and this had shed light on the key areas that need development within the sector. Also, the

cooperation with IFIs in successive projects has addressed some of these weaknesses to some extent. The respondents have highlighted some issues specific to the sanitation sector that have adversely affected the performance of projects in the past. One of the main issues was the conflict in mandate between government agencies operating in the same sector. The lack of capacity of some of these agencies with respect to proper project management and procurement processes was also identified as prominent issue within sector. In addition to the previous issues that constitute substantial capacity and strategy risks, projects in this sector normally involve significant environmental and social effects. Moreover, respondents stated that many of the projects are expansions to the existing infrastructure networks which means land acquisition is a major challenge.

Respondents ranked Technical Design and Implementation as a minor risk in the sanitation sector, this was explained by the repetitive experience of professionals and firms in projects within the sector. Respondents also stated that they have been able to manage liquidity and fiduciary risks adequately in sanitation projects especially in the recent years.

## Sanitation and Waste Mangement



**Figure 16: Risk Categories Severities for the Sanitation & Waste Sector**

Figure 7 above represents an overview of the severity each risk category on projects within the sector. The overall risk profile in the sanitation sector is more inclined towards risks that relate to the capacity to achieve results.

### IV.3.4 [Education](#)

Experts ranked Liquidity as the most severe risk that encounters education projects in Egypt. Following Liquidity, Institutional Capacity and Sector Strategies/Policies were identified as key risks that are often critical in education projects. The last two considerable risks were Fiduciary and Technical Design/Implementation.

Respondents in the education sector emphasized the unique nature of these projects in comparison with other infrastructure projects that depend heavily on resources and heavy construction. Respondents explained that Institutional Capacity and Sector Strategies are often the main challenges to achieve project objectives in the education

sector. The focus on capacity and sector policies is predictable due to the nature of the education sector objectives globally that focus on aspects like the capacity of educators, the curricula design and social participation. However, the high severity of liquidity risks in the education sector was attributed to reasons that are specific to the sector in Egypt and the previous experience of the respondents within the country. Experts revealed that it was common for education projects in Egypt to face liquidity and shortage of funds problems. Experts further explained that shortage of funds is also caused by ineffective sector policies; such as adopting “line budgeting” as opposed to “programme budgeting”. The line budgeting practice does not allocate direct costs to specific projects which often results in shortages in funds from the government’s side. Consequently, projects would be interrupted until these shortages are covered by either by additional loans/grants from existing IFIs or by alternative sources for finance. The issue of ineffective budgeting practices also contributes to Fiduciary risks since the absence of a detailed project specific budget makes tracking down that funds were spent on the intended purpose.

Another considerable risk identified by respondents was the Technical Design/ Implementation. However, the focus of the respondents was on the “soft” aspects of design such as identifying the key areas for development and designing programs that effectively address them.

Macroeconomic, Political, Stakeholders, and Environmental risks were ranked as least severe risks in the sector. The low impact of Macroeconomic risks on education projects was explained by the relatively low dependence of these projects on imported materials and services. Also, the low severity of Stakeholders, and Environmental risks reasonable considering the nature of such projects which normally do not involve heavy construction and infrastructure networks. Accordingly,

projects in the education sector seldom have any adverse environmental or social effects that are challenging to contain and mitigate.

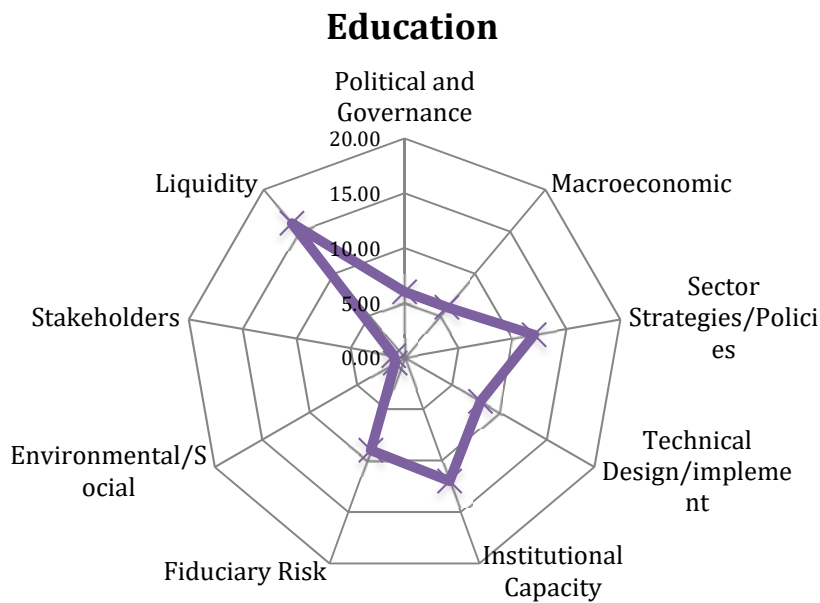


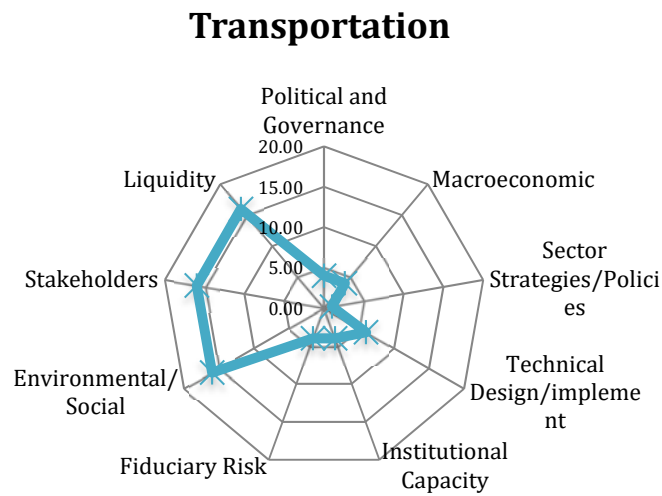
Figure 17: Risk Categories Severities for Education Sector

Figure 8 above provides an overview for the distribution of risks within sector. Liquidity risk stands out as a key risk in education projects that was explained by experts to be relevant to the sector in Egypt specifically.

#### IV.3.5 [Transportation](#)

Respondents ranked Liquidity, Stakeholders, Environmental risks as the most severe risks encountered in the Transportation sector. Experts elaborated that the main challenge in transportation projects is often the control of inputs and the availability of resources. Another challenge identified by experts was the massive expropriation of lands that transportation projects involve, which is a challenge often faced by such projects globally. Sector Strategies, Institutional Capacity and Fiduciary risks were ranked least in terms of severity as experts stated that challenges to delivery in transportation projects generally do not relate to capacity or sector policies. Experts also ranked Technical Design, Macroeconomic, and Political risks as low severity risks

explaining that the professionals within the sector have been able to manage such risks effectively.



**Figure 18: Risk Categories Severities for Transportation Sector**

Figure 9 above clarifies that Liquidity, Stakeholders, and Environmental risks are the prevailing risks in transportation projects.

#### **IV.4 Complexity of Result-Based Finance**

The design of the P-for-R is rather different than the other conventional financing schemes that link disbursements to actual payments. Respondents were asked whether they find the design of P-for-R challenging since it links disbursements to predefined milestones instead of actual payments. 29% of the respondents were neutral about this statement and equally 29% agreed to that statement. 19% of the respondents strongly agreed that P-for-R adds to project complexity. Also 14% disagreed with that P-for-R adds to project complexity, while only 5 % strongly disagreed with that statement.



### Result-Based Finance adds to Project Complexity ?

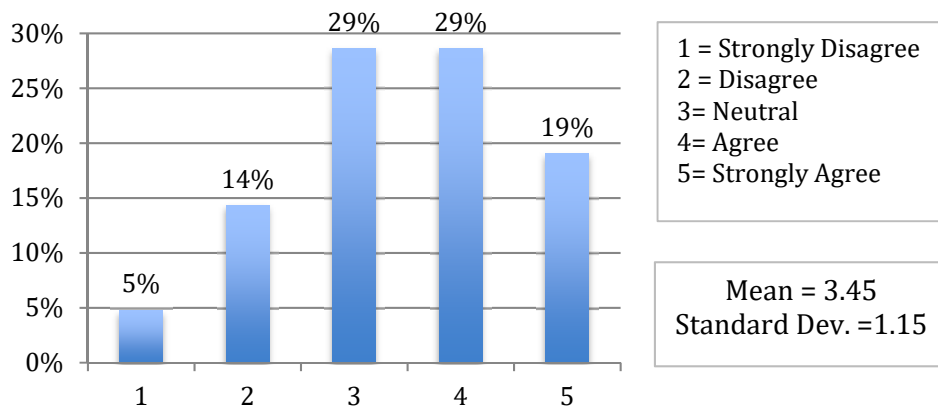


Figure 19: Feedback (%) on P-for-R Complexity

The above figure 10 summarizes the feedback of respondents on the complexity of P-for-R projects. The mean of answers was equal to 3.45, which falls between “Neutral” and “Strongly Agree” with a standard deviation of 1.15. This shows that the respondents slightly agree that P-for-R adds complexity to project design. As a matter of fact some of the experts acknowledged this fact and stated that they often prefer to include technical assistance from IFIs in the design of such projects.

#### IV.5 Effectiveness of Capacity Building in Result-Based Finance

Building on the issue of complexity P-for-R, it was important to assess to what extent does the result-based finance scheme support capacity building to address such complexity. In Fact, 43% of the respondents strongly agreed that result based finance effectively supports capacity building. 38% agreed to the statement and 19% were neutral concerning it. However, none of the respondents disagreed or strongly disagreed with the statement.

## Result Based Financing effectively supports capacity building

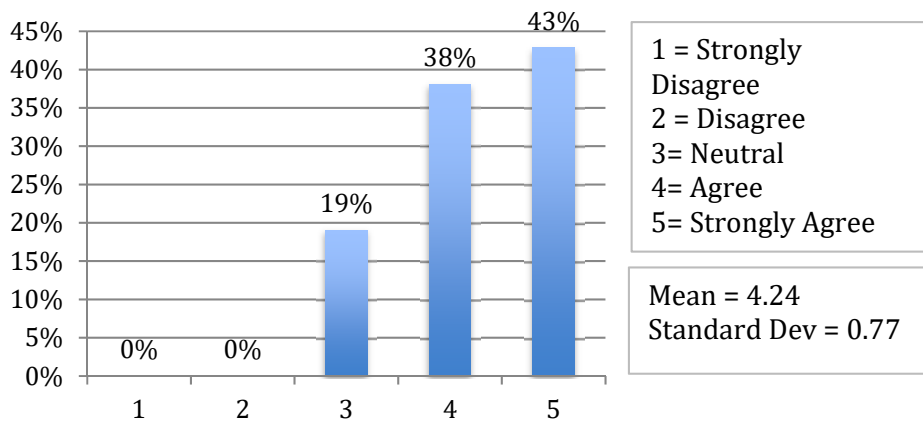


Figure 20: Feedback of Respondents on effect of result-based finance on Capacity

As the above figure 11 shows, the mean of the answers is 4.24 which falls between “Agree” and “Strongly Disagree”, and the standard deviation is 0.77. This shows that there is a clear consensus that the result-based finance scheme effectively contributes to capacity building.

### IV.6 General Preference of Respondents with respect to IPF and P-for-R

When asked about the preferred lending instrument for their sectors, 87% of the respondents chose P-for-R, while the remaining 13% that chose IPF were professionals working in the Energy and Healthcare sectors. Professionals in both sectors believe that IPF is better suited to the nature of projects in their sectors that require major upfront financing. However, it was noted that P-for-R can accommodate for certain types of projects in these sectors such as primary healthcare centers and the upgrading of existing services. All respondents noted that while a certain lending instrument might be generally suitable for their respective sectors, each project has unique needs and specific challenges of its own.

### Which Instrument is better suited for your sector ?

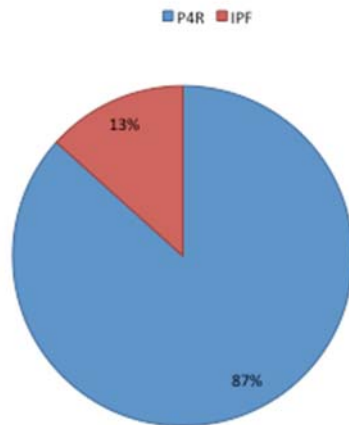
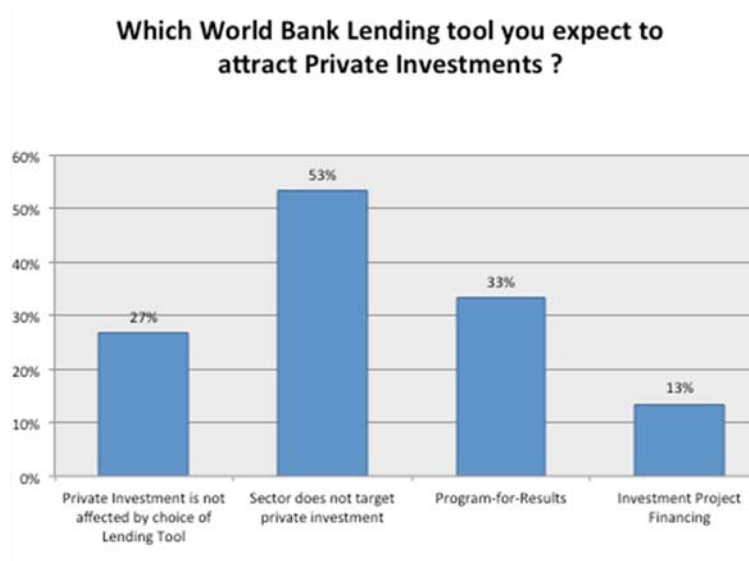


Figure 21: Feedback on P-for-R vs. IPF for Sector

#### IV.7 Attraction of Private Investment as a Criterion

The interviews revealed that professionals working on infrastructure projects in Egypt are not concerned with the involvement of the private investors. In fact, 53% of the respondents stated that the sector does not target private investors since the service is subsidized which makes it hard to accommodate for private investors. Also, 23% of the respondents indicated that neither of the instruments would attract private investors to participate in infrastructure projects.

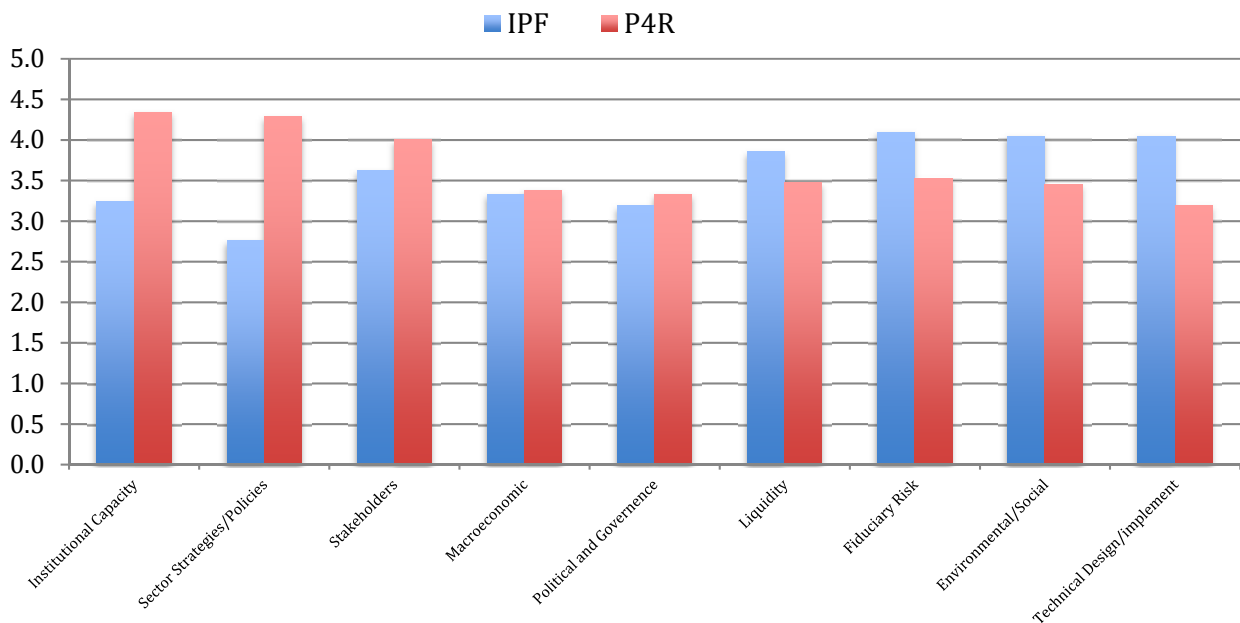


#### IV.8 Risks Addressed/Associated with IPF and P-for-R

Experts were asked to assess how well does each of the two financing schemes address each of the specified risk categories. Answers to the seventh question indicate that P-for-R is believed to address Institutional Capacity, Sector Strategies and Policies and Stakeholder risks better than IPF. On the other hand, IPF is believed to address Fiduciary, Technical Design/Implementation, Environmental/Social, and Liquidity risks more effectively.

The following figure shows the average scores provided by experts for each instrument against each risk.

**How well does each Instrument address each Risk**



**Figure 22: How well does each instrument address project risks**

##### IV.8.1 Institutional Capacity Risk

The high average score ranking for P-for-R in addressing Institutional Capacity and Sector Strategies risks is quite reasonable as the instrument was devised specifically to address these risks. Although 48% of the respondents agree to some extent that P-for-R adds to project complexity, there is a general consensus that P-for-R effectively

contributes to the capacity building as 81% of the respondents agreed to this statement. Experts explained that in addition to the focus on results, P-for-R allows countries to achieve their project and sector objectives using their own systems. This guarantees that any benefits from capacity building activities are sustainable, unlike conventional IFI financed projects where the benefits are usually exclusive to the implemented project since execution often relies on the IFIs' systems and policies.

#### IV.8.2 Sector Policies and Strategies Risks

Also, experts explained that the design of P-for-R allows for addressing Sector Strategies/Policies risks by establishing DLIs that tackle these aspects. For example, one of the three key result area in the recent PforR Sanitation Project in Egypt was dedicated for strengthening the national sector framework and policies. DLIs under this results area were designed to address issues like the lack of financial sustainability, lack of coordination between different entities operating within sector, and recurring land acquisition issues.

Experts noted that in many cases, the World Bank would agree with the borrowing country on certain prerequisites including reform measures to be taken prior to signing the loan agreement. While this common practice might reduce the risks related to sector policies, the design for P-for-R allows the borrowing countries to address these risks at their own pace as they meet the pre-agreed DLIs over the project lifetime.

#### IV.8.3 Stakeholders Risks

The average ranking for the effectiveness of P-for-R in dealing with Stakeholder risks was 4.0 which is slightly higher than IPF which was ranked as 3.6. IPF addresses these risks through relevant policies and procedures that ensure that public consultations are conducted and the impact of the project on all stakeholders is studied thoroughly.

However, experts believe that P-for-R can address stakeholder risks more effectively through relevant DLIs that would tackle specific concerns of project stakeholders. Moreover, respondents pointed out that the nature of P-for-R reduces the probability of stakeholder risks as it involves relevant government entities heavily in the design of the project and the choice of DLIs.

#### IV.8.4 Macroeconomic, Political & Governance Risks

Respondents rated P-for-R as 3.4 and 3.3 in addressing Macroeconomic risks and Political & Governance risks respectively. The average rating for IPF was slightly lower at 3.3 and 3.2 for Macroeconomic and Political Risks respectively. Experts explained that these two risks categories are often addressed by the third instrument offered by the World Bank which is the Development Policy Financing. Nonetheless, respondents have made the following remarks:

- Both instruments mitigate Inflation and Foreign Exchange rate risks by disbursing in dollars.
- P-for-R can be used to mitigate Political & Governance risks by enhancing the institutional capacity of implementing agencies and reforming policies of infrastructure sectors. This would enable these governmental agencies to deal with such risks in a more effective manner
- Experts predicted that P-for-R can be a source of Political risk since some scholars perceive it as a “disguised Development Policy Loan”. This raises the concerns about what is known as “conditionality” which is the use of conditions to dictate changes in policies that might be undesirable by borrowing countries.

#### IV.8.5 Liquidity Risks

Experts rated IPF as 3.9 in addressing Liquidity risks and P-for-R as 3.5. The initial impression among most of the respondents was that IPF minimizes liquidity as disbursements are made against specific project expenses, hence covering the cost of project inputs regardless of project performance. On the other hand, P-for-R was perceived as a riskier alternative as disbursements are linked to future results. Respondents (especially in the government side) considered DLIs as a double edged weapon as the achievement of these DLIs can be delayed or prevented by other unforeseen risks that can even be beyond the control of the implementing agencies. Another concern raised by some of the experienced respondents was the ability of P-for-R design to cater for changes and variations especially during construction. Respondents with experience in World Bank-funded projects explained that the bank usually allow up to 20% increases in project funding to deal with changes, variations and increases in the cost of inputs. In the case of P-for-R, it is unclear how would it cater for such changes provided that it does not disbursement against specific expenses to start with. Moreover, the fact that P-for-R disburses against the achievement of results makes it unsuitable for projects that require massive upfront financing such as power stations and water treatment plants.

However, other respondents from the World Bank pointed out that the issue of upfront financing is partially addressed in the P-for-R policy that allows up to 25% advance payment of the loan amount in addition to further 25% that can be disbursed against “soft DLIs” that can be achieved in an early stage of the project without massive expenditure. Furthermore, they pointed out that the risk to achieving DLIs should be minimal considering that these DLIs are developed jointly with the borrowing country entities.

#### IV.8.6 Fiduciary Risks

IPF scored an average of 4.1 in addressing Fiduciary risks while P-for-R scored an average of 3.5. The higher score of IPF with respect to Fiduciary risk in comparison with P-for-R was explained by the following:

- The IPF disburses against specific expenses in separate dedicated accounts that are created for the project, and requires proof for such expenses. Accordingly experienced bank staff can track the expenses and make sure the loan amounts are used appropriately for their intended purposes.
- P-for-R on the other hand, does not disburse against specific expenses but rather against DLIs and project milestones. Hence, it verifying that funds are used in their intended purpose would be a tedious task since the intended purpose is not solidly defined.
- Unlike IPF, P-for-R disburses the loan amounts in the general budget which in turn disburses the loan amounts to the account of the implementing agency. While some respondents argued that this process increases the involvement the Central Bank and the Ministry of Finance in monitoring expenses, this arrangement is believed by most respondents to hamper the bank staff from the tracking the proper use of bank funds because “money is fungible” and it would be challenging to track its use once it is disbursed in the general budget.

#### IV.8.7 Environmental/Social Risks

IPF was rated as 4.0 in addressing Environmental & Social Risks and P-for-R was rated 3.5. Experts noted that P-for-R does not finance “Category A” projects that have severe irreversible adverse social and/or environmental impacts. Accordingly, the comparison between IPF and P-for-R would not be objective provided that P-for-R avoids high risk projects altogether. Nonetheless, experts explained that they would



rate IPF higher in addressing Environmental and Social risks since IPF requires implementing agencies to abide by strict Bank Operation Policies.

#### IV.8.8 Technical Design & Implementation Risks

The average rating for IPF was 4.0 for addressing Technical Design & Implementation risks, while P-for-R was rated as 3.2 on average. Experts explained that the design of P-for-R places only a portion of the focus of the project team on the technical design and implementation and places more focus on capacity building. However, in IPF the main focus of the project team is concentrated on the design and implementation of the project.

#### IV.8.9 Statistical Significance

It is noteworthy that differences in scores for IPF and P-for-R against different risks were very minor in many cases, hence there was a need to determine the significance of these differences in order to determine which of these risks should drive the choice of the finance instrument.

The difference in scores assigned by the respondents to IPF and P-for-R against each risk was tested for statistical significance using Mann-Whitney test as shown in figure 14. The test revealed that there is no statistical significance for the difference in scores assigned to IPF and P-for-R with respect to Macroeconomic, Political and Governance, Fiduciary, Stakeholder, and liquidity risks. On the other hand, the P-value is less than 0.05 for the difference in scores between the two instruments concerning Sector Strategies/Policies, Technical Design/Implementation, Institutional Capacity, and Environmental/Social risks, which indicates that there are significant differences between the two instruments regarding addressing these risks.

SORT Risks	Investment Project Finance			Program for Results			Mann-Whitney Test
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	P-value
Political and Governance	3.19	3.00	0.75	3.33	4.00	1.06	0.42
Macroeconomic	3.33	3.00	0.66	3.38	3.00	0.92	0.68
Sector Strategies/Policies	2.76	3.00	0.83	4.29	4.00	0.72	0.00
Technical Design/implementation	4.05	4.00	0.80	3.19	3.00	0.87	0.00
Institutional Capacity	3.24	3.00	0.44	4.33	5.00	0.80	0.00
Fiduciary Risk	4.10	4.00	0.70	3.52	4.00	1.12	0.09
Environmental/Social	4.05	4.00	0.67	3.43	3.00	0.87	0.01
Stakeholders	3.62	4.00	0.80	4.00	4.00	0.84	0.13
Liquidity	3.86	4.00	0.96	3.48	4.00	1.12	0.23

Figure 23: Mann-Whitney Test P-Values for Question 7 Responses

## IV.9 Advantages & Disadvantages of P-for-R with respect to IPF

Experts with experience in P-for-R and IPF provided elaborations on the advantages and disadvantages of the newly introduced P-for-R tool in comparison with the conventional IPF financing scheme.

### IV.9.1 Advantages of P-for-R over IPF

- The disbursement mechanism is generally more flexible. Firstly, up to 25% of the loan amount can be disbursed for the implementing agency to facilitate the startup activities of the project. Also, the disbursements are usually faster since much less Bank policies and procedures apply to P-for-R loans
- Money is disbursed to the state general budget; this means that there is double monitoring by the Central Bank of Egypt in addition to the World Bank and the independent consultant responsible for the verification of Disbursement Linked Indicators.
- The structure of the P-for-R makes it easier for the government to monitor results and link them with the country strategic goals

- Result oriented mechanism of the P-for-R allows for more innovation from government agencies to meet the results. IPF is much less flexible since payments must be made against pre-identified items.
- Respondents with experience in IPF projects complained that the Bank staff usually tends to micro-manage and be involved in every single detail in the project which often caused delays in payments which consequently might delay the project. This is exaggerated involvement was caused by the nature of IPF which requires staff to verify each expense before disbursement. However, P-for-R is expected to shift the focus of Bank staff on strategic goals and KPIs that are critical to project success and achieving development goals.
- The P-for-R design encourages implementing agencies to leverage their processes and capacities to achieve desired results with their own systems. This approach ensures better organizational learning as opposed to relying on entities that are created for the purpose of a certain project/program. Accordingly, achieved results and enhancements in institutional capacity are expected to be more sustainable in P-for-R projects.

#### IV.9.2 [Drawbacks of P-for-R in Comparison with IPF](#)

- While relying on government system has its merits, it is also a great challenge. It is common for government systems in developing countries to suffer from a lot of inefficiencies and is usually unpredictable. This fact can impose a great risk on the project/program objectives.
- Another disadvantage is that the focus of the bank and implementing agency might be diverted from the core technical deliverables since these might be just one of several DLI result areas.

- The instrument obviously does not attempt to control inputs to any extent. This might exacerbate fiduciary risks since there is no way to make sure that the Bank's money is spent on the intended purpose. This is especially true in sectors where the bank's finance does not constitute a great portion of the sector budget.
- Another concern raised by professionals is the lack of experience in the Egyptian public sector in dealing with P-for-R. In their view, this can subject the borrower to legal, financial and operational risks since they are less familiar with the instrument.
- The application of P-for-R might be limiting in change management since the disbursements are made against results not specific inputs. Accordingly, adjustments in loan amounts to cover increases in the cost of inputs would be much less likely in P-for-R in comparison with IPF. According to the respondents with experience in World Bank projects, the Bank's team leaders in IPF projects usually have the authority to approve for up to 20% increases in finance. Such flexibility is necessary infrastructure projects to cater for cost overruns, variation order requests and contractor claims that are inevitable in most construction projects.

#### **IV.10 Summary of Key Findings**

- Cost of finance, financial barriers, and the ability of the instruments to address project risks were identified as the most important criteria for the choice of lending instrument. However, in the context of World Bank instruments project risks stand out as the most relevant criterion.

- Result-based financing schemes such as P-for-R might add to the complexity of projects but they significantly enhance the capacity of implementing agencies to deal with complex projects.
- The main advantages of P-for-R is its goal oriented nature, and its reliance on the country existing systems which ensures the sustainability of enhancements in capacity of implementing entities.
- The main advantages of IPF are its strict control on inputs and its focus on technical design and implementation.
- The feedback of experts on the effectiveness of P-for-R and IPF in addressing project risks was analyzed, and the following figure demonstrates which risks are addressed by each instrument.

IPF	P-for-R	DPL
<ul style="list-style-type: none"> <li>• Technical Design/ Implementation</li> <li>• Environmental/ Social</li> <li>• Fiduciary</li> <li>• Liquidity (<i>low significance</i>)</li> </ul>	<ul style="list-style-type: none"> <li>• Institutional Capacity</li> <li>• Sector Strategies/ Policies</li> <li>• Stakeholders (<i>low significance</i>)</li> </ul>	<ul style="list-style-type: none"> <li>• Political &amp; Governance</li> <li>• Macroeconomic</li> </ul>

Figure 24: Risks addressed by each World Bank Instrument

- The below figure summarizes the key risks encountered by professionals in each infrastructure sector in Egypt. Building on the conclusions stated in the previous point, risks that are better addressed by P-for-R are highlighted in Red, risks addressed by IPF are highlighted in Blue, and risks where

differences between instruments was of no statistical significance were highlighted in Grey.

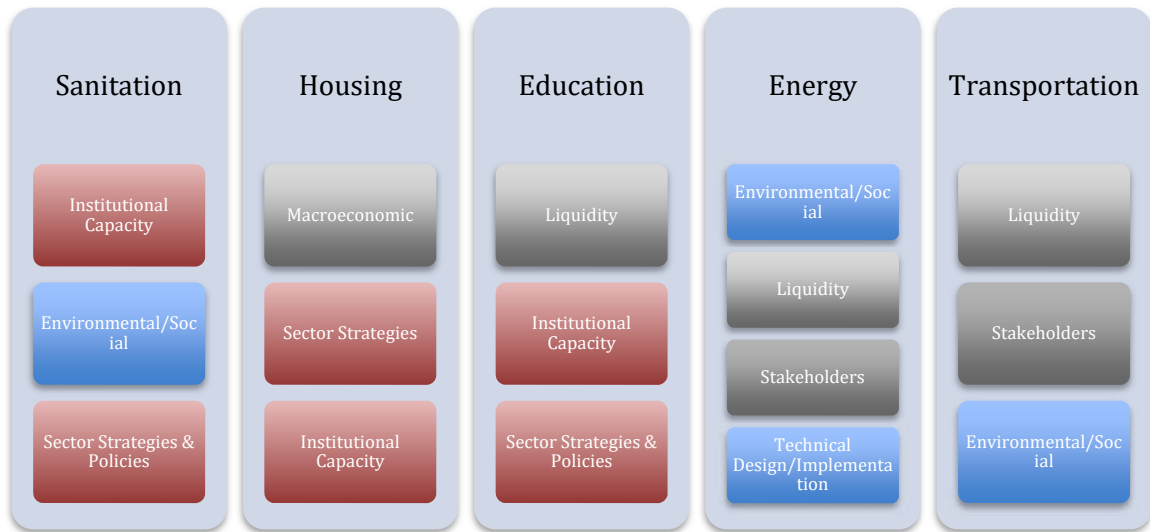


Figure 25: Top Risks across different Infrastructure Sectors in Egypt

- Based on Figure 16, it is concluded that P-for-R is more suitable for sectors where the main risks relate to the *capacity* of implementing agencies and the *policies* and *strategies* of the sector. The interviews revealed the *sanitation*, *housing*, and *education* sectors in Egypt fall under this category. On the other hand, IPF is better suited for sectors whose projects require strict control over inputs and the key risks relate to complex technical design and implementation, in addition to projects with high environmental & social risks. The analysis of interviews revealed that Energy and Transportation sectors in Egypt fall under this category.
- It was concluded by respondents that each finance scheme might be better suited to certain sectors, however, the choice of financing instrument must be

studied for each project separately in order to address the specific challenges and risks associated with this project.

# Chapter V: : Framework Development

## V.1 Proposed Framework

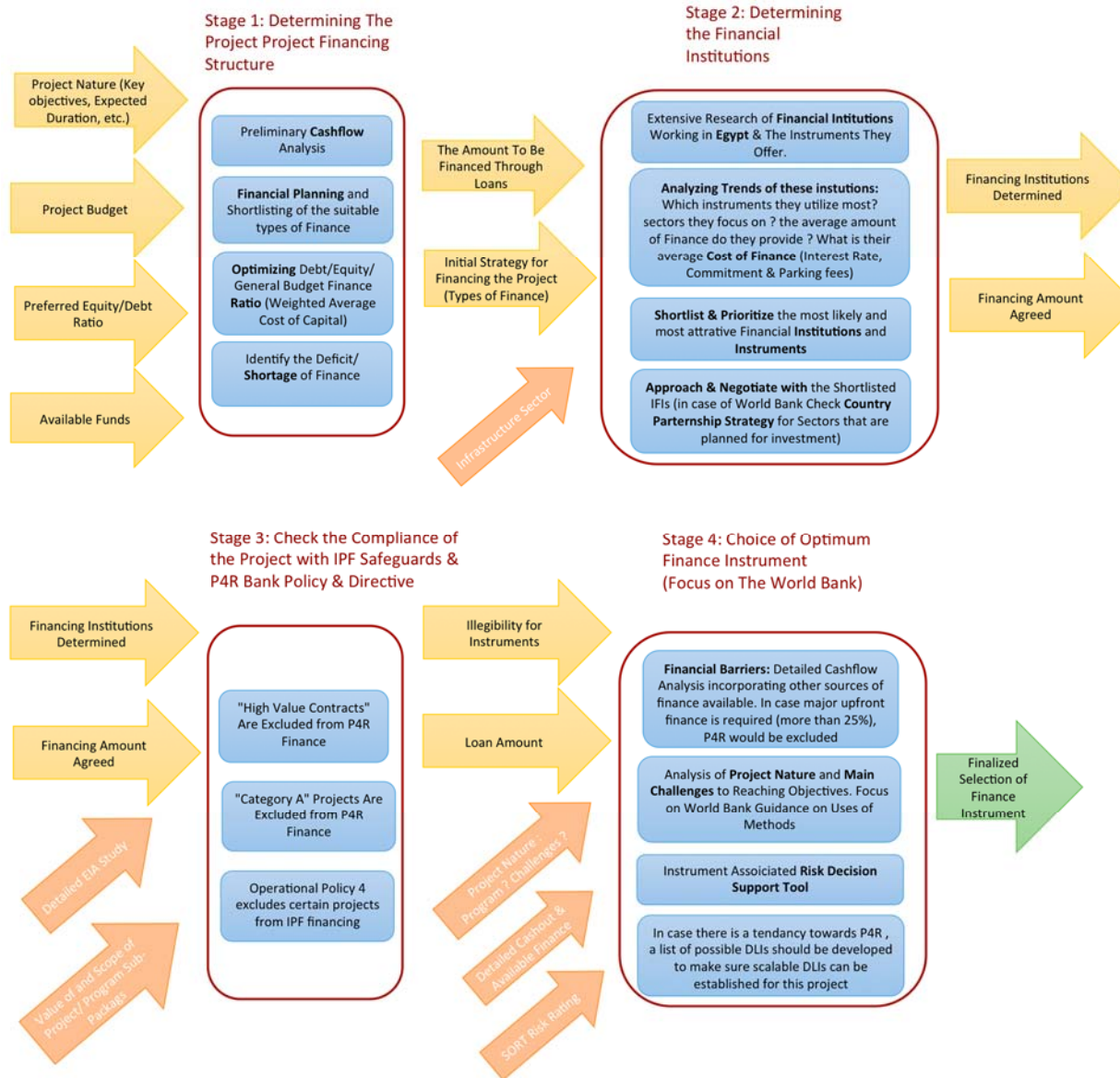


Figure 26: Detailed Framework Flowchart

The above figure illustrates the detailed decision support framework proposed by this study for the selection from World Bank Lending Instruments. The first and second stages depict the common practice in selecting the funding structure and IFIs. The third stage summarizes the World Bank guidance on the eligibility for finance through IPF and P-for-R. The fourth and final stage builds on the analysis of expert interviews in



order to match the project nature and risk profile with the best-suited World Bank lending instrument

## **V.2 Driving Concepts**

- **Financial Management stages**

Turner (2007) explains the key stages of the financial management process starting with Studying the financial feasibility, followed by financial planning and determining the optimum finance structure, then raising the capital and approaching banks and investors. These stages are followed by the monitoring & control during execution. The proposed framework builds on the structure and sequence of stages proposed by Tuner (2007) and develops these stages to adapt the process to World Bank finance instruments particularly.

- **Selection criteria from the literature and experts**

The key criteria in the literature for the selection of financing schemes in infrastructure projects were explored. These criteria were discussed with experts to evaluate their relevance to World Bank instruments and the importance of each criterion for projects in Egypt.

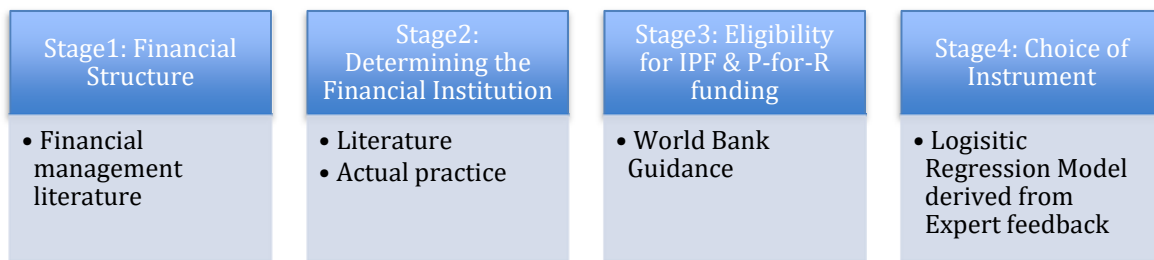
- **World Bank guidance on the selection of finance instruments**

The following documents issued by the World Bank are crucial for understanding the uses of World Bank instruments and were considered in the design of the framework.

- P-for-R 2 year review
- P-for-R Concept Note
- P-for-R & IPF Bank Policy and Operation Policy Documents

- **Expert feedback on World Bank Finance Instruments and relevant risks**

As previously discussed in this study, the analysis of World Bank instruments revealed that ability of each instrument to address key project risks would be a critical factor in the final choice of instrument. A logistic regression model was derived from the expert feedback in order to match project risks with the funding tool that better addresses these risks

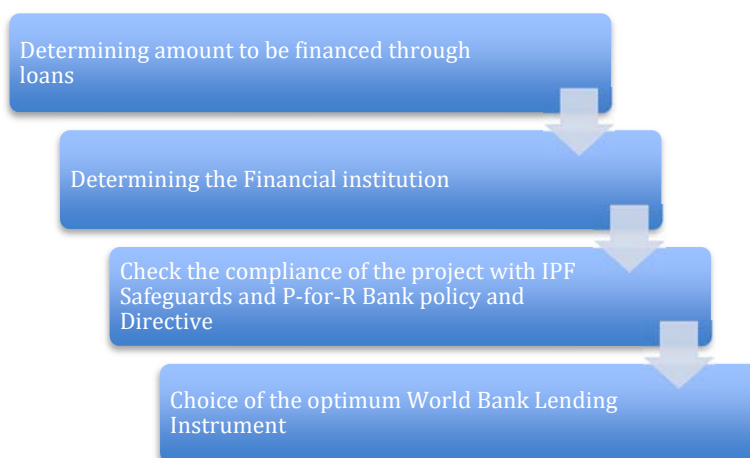


**Figure 27: Arriving at the Framework**

The above figure summarizes how the driving concepts were utilized to arrive at the devised framework.

### V.3 Explanation of Framework Key Stages

After analyzing the interviews, relevant literature and World Bank guiding documents for the optimum selection of lending instrument for financing infrastructure projects, the following simple 4-step framework is proposed to approach the issue:



**Figure 28 : 4-Step framework for the selection of finance instrument**

### V.3.1 Stage1: Determining the Project Finance Structure

The borrowing government must determine the most economic combination of public funds, private equity, and loans. The average cost of capital for different scenarios should be studied along with the optimum debt/equity ratios that would yield the maximum efficiency according to the literature and past experiences. Also, the financial barriers including the availability of each type of finance should be considered in this stage.

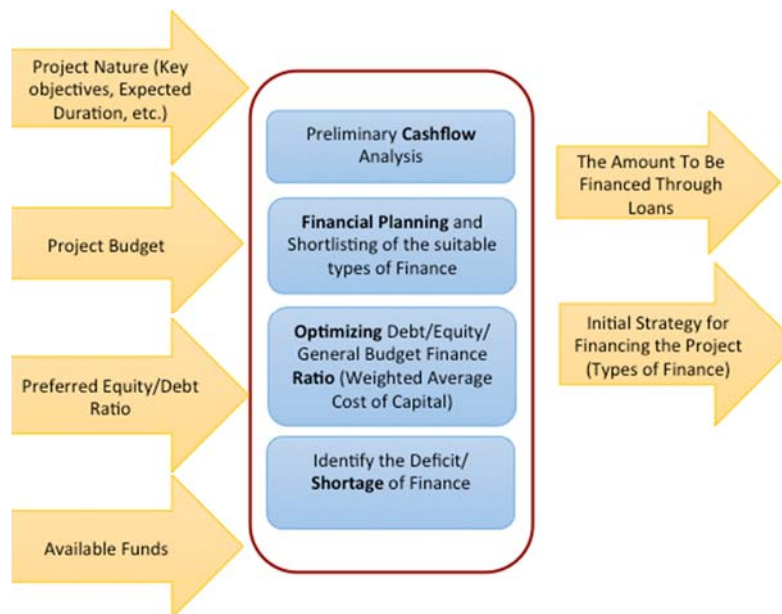


Figure 29: Stage 1 - Determine the Project Finance Structure

#### V.3.1.1 Financial Barriers

Examples of financial barriers to be addressed are:

- Projects with major upfront finance required such as energy projects.
- Lack of access to private investments.
- Budget deficits limiting the ability of government to provide public funds.
- Lack of project revenue which would reduce options such as project finance.

This can be due to subsidized services which is generally the case in Egypt.

### V.3.2 Stage 2: Determining the Financial Institution

Once the amount to be financed through loans is determined, a survey of the international financial institutions that are active in Egypt has to be conducted.

Based on the literature and conducted interviews the following are the proposed criteria for the choice of the IFIs to approach to seek finance:

- The size of the financial intermediary
- Experience in providing finance for projects of similar nature
- Technical support this bank can offer with respect to the finance methods and financial planning.

Zahran and Ezeldin (2016) presented a list of the major financial institutions and analyzed the trend of funding provided by these institutions. This includes an analysis of the regions, infrastructure sectors, and the finance mechanisms that each financial institution tends to utilize most. The list of institutions can then be sorted by the likelihood to approve the funding required in order to approach the institutions that are most likely to approve. The borrower may choose to cover the required loan amount by more than one lender.

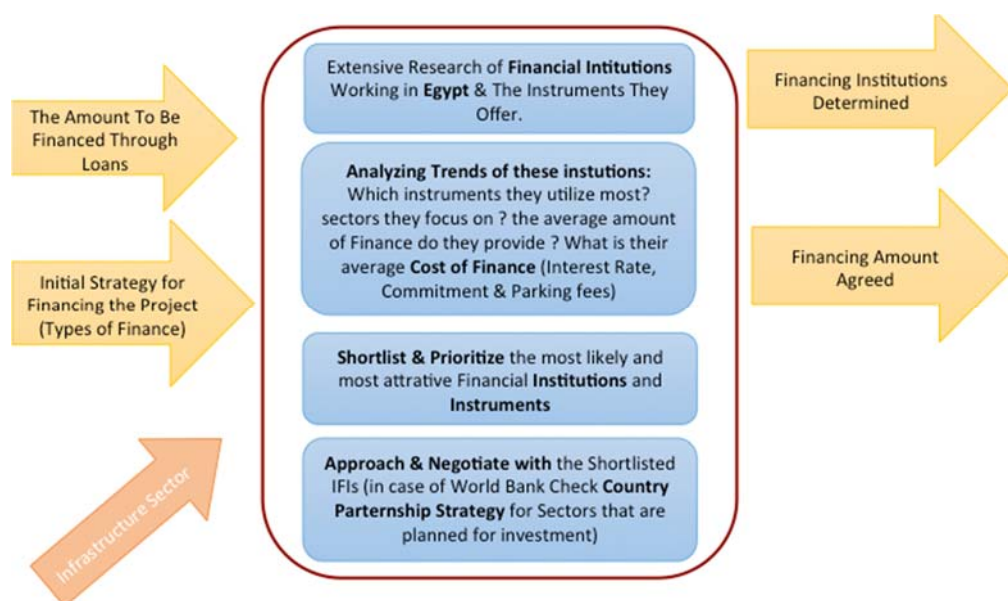


Figure 30: Stage 2 - Determine the Finance Institution

### V.3.3 Stage 3: Check the Compliance with IPF Safeguards and P-for-R Bank policy and Directive

Following the choice of the lending institution, the policies and guidelines for the instruments of the selected lending institution must be reviewed. In the case of the World Bank, the IPF safeguards and P-for-R bank policy and directive must be reviewed to verify that the project is eligible for finance through the available methods. Restrictions on the use of any of the selected instruments might be limited to just a portion of the project or certain activities and not necessarily the whole project. This stage might overlap the previous stage in some cases where the choice of financial institution might be itself affected with lending instrument offered by the financial institution.

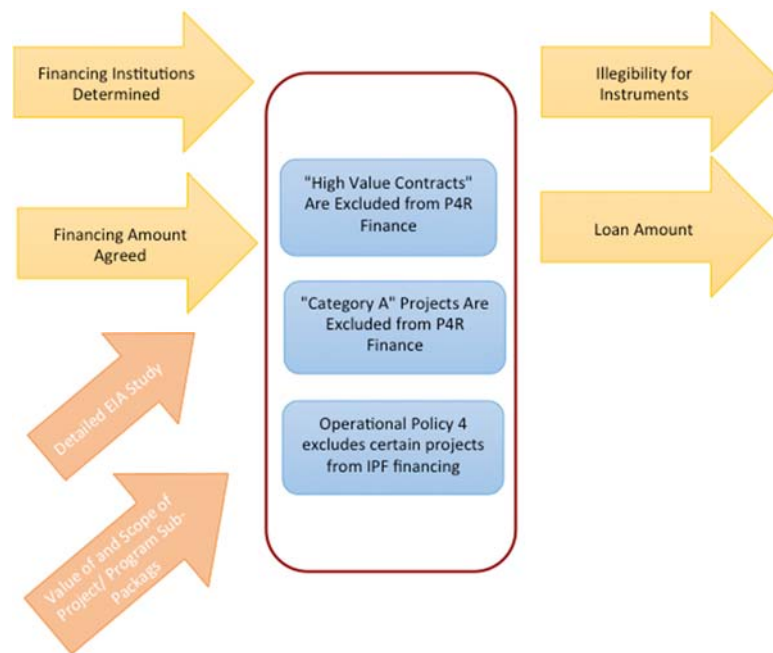


Figure 31: Check Project Eligibility for both instruments

#### V.3.3.1 IPF Eligibility

The Eligibility of projects to IPF are subject to *legal, environmental, and social* safeguards that were discussed in the literature review section. These safeguards are explained thoroughly by Himberg (2015) Bank consultation report and compared

with other IFIs in detail. The following figure summarizes the Operational Policies that a project must comply with in order to be eligible for finance through IPF.

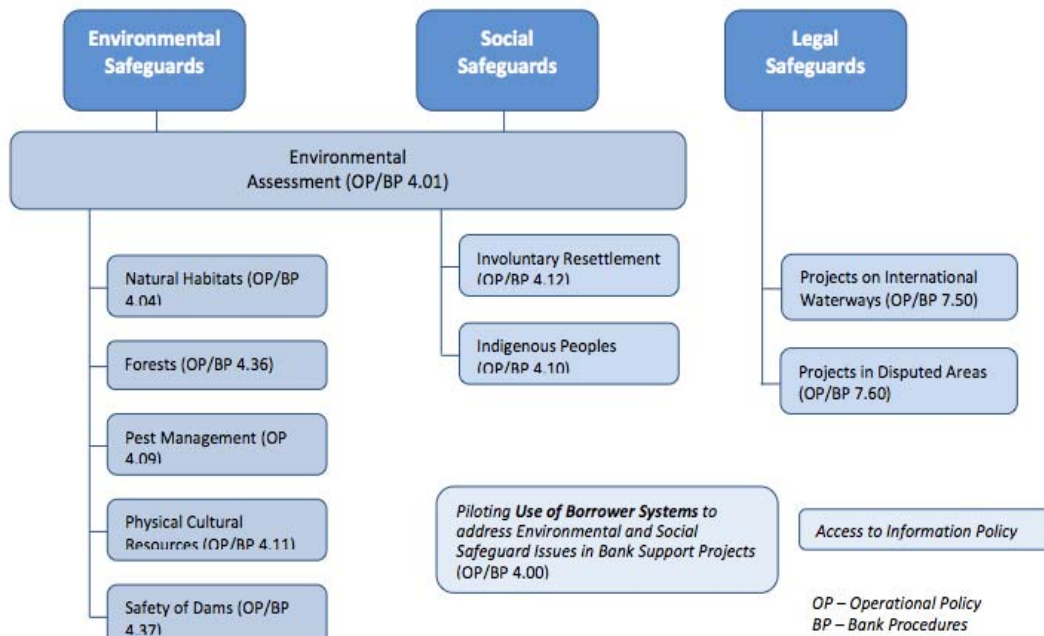


Figure 32: IPF Safeguards (Himberg, 2015)

### V.3.3.2 P-for-R Eligibility

The P-for-R instrument does not finance high-risk projects and “high-value” contracts, this is because this instrument relies on the borrower country systems and policies rather than the World Bank’s policies and safeguards. Exclusions from the P-for-R finance were discussed in the literature but this section will elaborate on methods of identifying high-risk projects that are likely to be excluded.

#### **High Value Contracts**

The P-for-R Bank Policy and Directive prohibit what would be labeled as “High-Value Contracts” from finance through the P-for-R instrument. The thresholds for defining high-value contracts are demonstrated in the literature section that discusses the World Bank Guidance on the selection of instruments. The lowest of these thresholds (for the highest risk projects) is \$50 M.

## **High Risk “Category A” Projects**

As previously mentioned in the literature review section, “Category A” projects are excluded from finance through the P-for-R instrument. Specialized Bank staff does the Environmental and Social assessment of projects, however, the following are some proposed guidelines to anticipate the outcome of such assessment.

- **Indicative Lists**

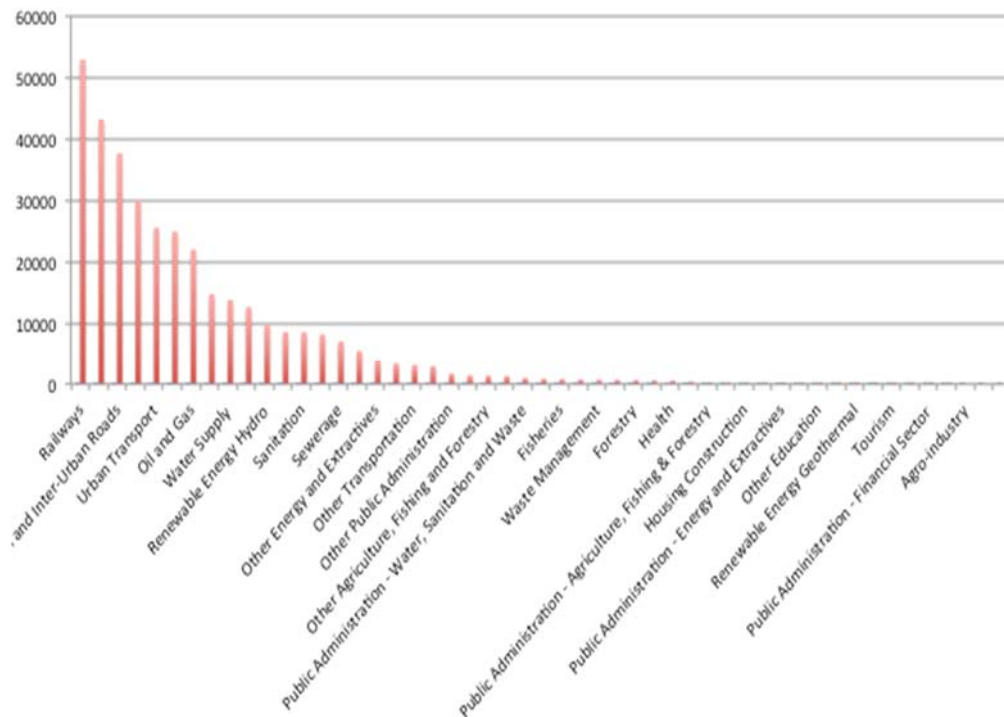
Some of World Bank assessments use Indicative lists to guide the environmental risk assessment of such projects. Kiss (2012) provides examples of infrastructure projects usually included in Category A and Category B indicative lists as summarized in the below table.

**Table 8 : Indicative Lists of World Bank Category A & B Projects (Kiss, 2012)**

<b>Category A Projects Indicative List</b>	<b>Category B Projects Indicative List</b>
<ul style="list-style-type: none"><li>• Huge infrastructure projects such as railways, ports, transportation projects.</li><li>• Power stations and oil &amp; gas projects.</li><li>• Large irrigation and agriculture projects</li><li>• Huge housing, sanitation, waste management projects</li><li>• Industrial &amp; manufacturing projects</li><li>• Any project with “severe adverse impact” on natural or cultural resources</li></ul>	<ul style="list-style-type: none"><li>• Small infrastructure projects including small energy and sanitation projects</li><li>• Small irrigation and agriculture projects</li><li>• Healthcare Services</li><li>• Education projects involving construction</li><li>• Construction and repair projects where hazardous material might be used</li></ul>

- Past Projects

Another proposed approach to predict the environmental impact category of a project is to examine the environmental category of previous projects of the same nature and sector. The below figure shows the % of “Category A” projects per infrastructure sectors which would provide an indication for which projects are more likely to be categorized as “Category A”.



**Figure 33 : Category A Projects per Sector (The World Bank, 2017)**

It is noteworthy that the infrastructure project categories that make up most of the budget of “Category A” projects in the figure do match the categories mentioned in the indicative list.



- “Category A” vs. “Category B” Guiding Criteria

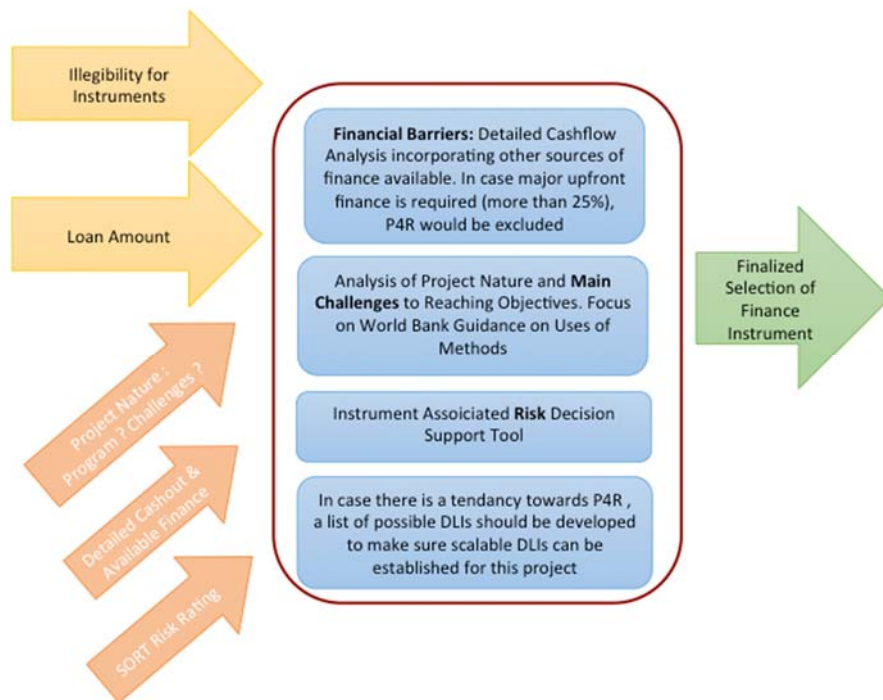
It can be noted that the limits between both categories can still be blurry for some infrastructure projects, but Kiss (2012) provides further guidelines on how the bank assesses these categories that can be useful for evaluating such “borderline” cases. These key decision criteria are summarized in the below table:

**Table 9: Category "A" vs "B" Decision Criteria (Kiss 2012)**

Criteria	Category A Projects	Category B Projects
Impacts	Significant, various, extend further than project location, includes major resettlement, conversion of natural habitats	Less adverse, limited, fewer (in comparison to “A”, and can be controlled within project area.
Mitigation	Impacts are irreversible and can be challenging to mitigate	Mitigation measures can be designed and applied more easily
“EIA” breadth and depth	Includes: stakeholder consultation, assessment of off-site, cumulative, and indirect impact, institutional analysis, independent preparation	A limited EIA is required but it usually site-specific and less extensive than “Category A” projects
High Risk Activities	Involves considerable quantities of hazardous material, involves pollution producing activities, construction of new roads	Any project that might include new construction or rehabilitation but typically wouldn’t include such high risk (Category A) activities
Scale & reversibility	Huge scale Resettlement of 100+ households, reservoir capacity > 3 mill. m <sup>3</sup> (guidelines not World Bank policy)	New construction wouldn’t exceed certain limits. Similar projects can be used for reference
Number of Applicable Safeguards	Projects would trigger several safeguards such as Natural Habitats, Safety of Dams, conservation of forests	Projects usually wouldn’t trigger many of these Safeguard policies

#### V.3.4 Stage 4: Choice of the Optimum World Bank lending Instrument

Provided that the project is eligible for finance with several lending instruments, the borrower can proceed with comparing the lending instruments provided by the chosen institution. This stage might overlap the previous stage in some cases where the choice of financial institution might be itself affected with lending instrument offered by the financial institution.



**Figure 34: Stage 4 - Selection of the Optimum Finance Instrument**

Several criteria have been identified in this research that would affect the choice of lending instrument. However, some of these criteria are not relevant in the case of World Bank such as the cost of finance, which is negotiated with the borrowing country separately along with the loan terms and are not factors in the choice of instrument. Accordingly, this framework proposes that the choice of instrument would be based on:

- Analysis of project nature: P-for-R is intended to support *programs* with various goals and objectives, usually the desired results include both “brick

and mortar” tangible deliverables, as well as capacity building and sector policy reform measures. On the other hand, IPF is intended for specific projects where challenges to achievement of project goals relate to the control of inputs and availability of resources.

- Financial barriers: The amount of upfront financing required at the beginning the project.
- The ability to determine practical and scalable DLIs in case there is a tendency to opt for P-for-R.
- The risks associated with the project are better addressed with which instrument

The issue of upfront financing required for the project is deterministic and can be easily evaluated using the preliminary cash flow analysis conducted at the beginning of the project. This is also the case for feasibility of developing practical DLIs for the project which can be assessed by conducting brainstorming sessions with project stakeholders. On the other hand, analyzing project risks and matching them with the optimum instrument is a much more complex task. Accordingly, a “Risk Decision Support Tool” was developed in order to guide the process of choosing the best suited finance instrument.

#### ***V.3.4.1 Risk Decision Support Tool***

According to the conducted interviews, IPF is better-suited projects that are expected to face technical design/implementation, liquidity, environmental/social and fiduciary risks. While P-for-R is more suitable for projects where the main risks relate to institutional capacity and sector strategies and policies. Hence, identifying the main risks associated with a project would be a major step in determining the suitable financing instrument.

## **Concept**

The feedback received from experts was analyzed and a regression model was developed using the “Logistic Regression” technique. The regression model links the severity of risks to the instrument that addresses this combination of risks more effectively.

## **Decision Support Tool Architecture**

The interface of the developed tool is quite simple to use; the user is asked to input the severity of each risk as shown in the below figure.

**Fill the yellow cells (values must range from 1 to 5)**

X#	Risks	Severity (User Input)
X1	Political and Governance	4
X2	Macroeconomic	4
X3	Sector Strategies/Policies	4
X4	Technical Design/implement	3
X5	Institutional Capacity	4
X6	Fiduciary Risk	4
X7	Environmental/Social	3
X8	Stakeholders	4
X9	Liquidity	2

**Figure 35 Decision Support Tool Inputs**

The severities of all risk categories are then substituted as “x” in the summation of the below generic logistic regression equation.

$$\pi = \frac{\exp(\alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9)}{1 + \exp(\alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9)}$$

Where “ $\pi$ ” is the output of the regression model, and the coefficients “ $\beta$ ” of each risk and the intercept “ $\alpha$ ” are listed in the below table. These coefficients were evaluated

from the feedback of experts on how well does each instrument address each of these risks using specialized statistical analysis software.

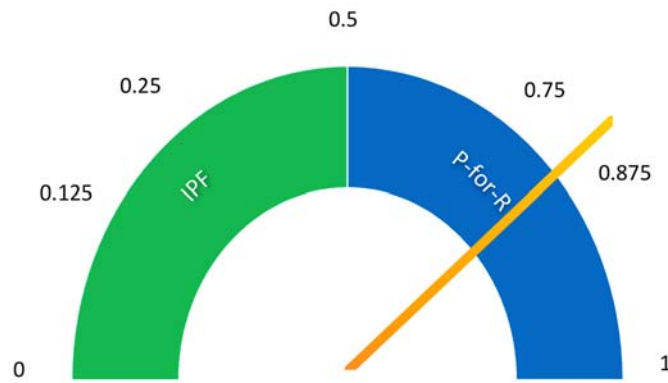
**Table 10: Coefficients of the Logistic Regression Model**

Symb.	Parameters	Coefficients
$\alpha$	Intercept	-10.5146909
$\beta_1$	Political and Governance	-1.42992218
$\beta_2$	Macroeconomic	0.50554508
$\beta_3$	Sector Strategies/Policies	3.85704335
$\beta_4$	Technical Design/implement	-0.9415895
$\beta_5$	Institutional Capacity	1.23304248
$\beta_6$	Fiduciary Risk	-0.18801359
$\beta_7$	Environmental/Social	1.29744365
$\beta_8$	Stakeholders	-0.217463
$\beta_9$	Liquidity	-1.22166147

Once the severities are substituted in the model, the output “ $\pi$ ” is calculated as a number between “0” and “1”. If the value tends more towards “1” i.e. greater than 0.5 then the recommended tool endorses the choice of P-for-R and vice versa. Below is the final equation after substituting the constants with the derived regression coefficients

$$\pi = \frac{\exp(-10.515 - 1.430X_1 + 0.506X_2 + 3.857X_3 - 0.942X_4 + 1.233X_5 - 0.188X_6 + 1.297X_7 - 0.217X_8 - 1.222X_9)}{1 + \exp(-10.515 - 1.430X_1 + 0.506X_2 + 3.857X_3 - 0.942X_4 + 1.233X_5 - 0.188X_6 + 1.297X_7 - 0.217X_8 - 1.222X_9)}$$

The Output is presented graphically as shown in the below figure in order to demonstrate to what extent does the recommended tool address the input risks better than the other.



**Figure 36: Example of Risk Decision Support Tool Output**

It is important to remember that while the proposed tool appear to be quite helpful in the choice of lending instrument, this study does not claim that this tool cannot be used as exclusively to determine the most suitable lending instrument. The following section will demonstrate through a selected case study how can this tool be integrated in an overall comprehensive assessment of the best-suited lending instrument for an infrastructure project in Egypt.

In order to guide the application of the framework on future projects, standard templates and forms were developed. These templates are used in the forthcoming validation section to apply the framework on an actual case study and are attached under Appendix III.

# Chapter VI: Validation

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## VI.1 Application of the Framework

In this section, the developed framework is applied on a validation case study in order to test its validity for infrastructure projects in Egypt. As explained in the previous section, the proposed framework is composed of 4 main components. The first 2 components relate to the financial planning process and the selection of the IFI to fund the project. These components are depicted from the literature and actual practice of industry professionals, hence, they are not the focus of the validation case study. Moreover, these stages require actual negotiations with several stakeholders, which cannot be realistically simulated.

The focus of the validation will be on third and fourth stages concerned with the Eligibility of the project for each World Bank financing instrument and the optimum selection from these methods.

## VI.2 Sustainable Rural Sanitation Services Project Case Study

The Sustainable Rural Sanitation Services Program (SRSSP) is the first phase of multi-phased *development program* that aims at improving access to sanitation in 769 villages in delta area of Egypt, this stage targets completing 167,000 household connections in Beheira, Dakahliya, and Sharkiya. In addition to *improving the capacity* of Public Water and Sanitation companies in Egypt. The following objectives were identified for the project:

- Strengthen institutions and policies for Sanitation sector
- Increasing access to sanitation
- Improving rural sanitation services in the Governorates of Beheira, Dakahliya, and Sharkiya in Egypt

### VI.2.1 Stage 1: Determining the Project Financing Structure

In this preliminary stage, the main features of the financing structure are determined including the sources of finance that the project team will pursue and the optimum combination of these sources.

#### **VI.2.1.1 Financial Planning**

This step is often lead by professionals who specialize in arranging financial packages. The purpose of financial planning is to minimize the cost of finance and make sure there are no funding shortages throughout the project life cycle. Typically, the output of this stage will determine the optimum contribution of each source of finance; public funds, private equity, and debt.

#### **Financial Barriers**

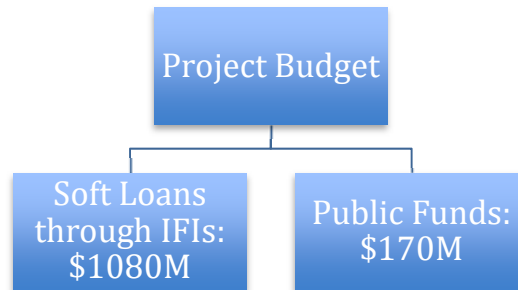
Professionals with experience in the sanitation sector were interviewed and the following were identified as the main financial barriers:

- A growing government general budget deficit; the growing deficit in the general budget means that the contribution of *Public Funds* in the project *will be limited*. Also, in order to minimize the burden of debt on the general budget, *Soft Loans* should be pursued to minimize the cost of finance and the extend the pay back period.
- Subsidized sanitation services; sanitation services are subsidized by government which means that the fee paid by the consumers would not cover the project expenses. This limits the options of adopting financial schemes such as “Project Finance” and *eliminates* the option of *including private equity investors*.



### VI.2.1.2 Stage 1 output:

The output of the financial planning stage is the following recommended financial structure:



The selected finance structure relies on finance through soft loans provided by IFIs. It is noteworthy that experts have indicated that IFIs usually require a minimum to contribution from the borrowing countries in the finance of any project to ensure commitment.

It is also recommended to search for IFIs that offer a wide range of options for finance including grants, result-based finance and technical assistance.

### VI.2.2 Stage 2: Determining the Financial Institutions

According to the output of the financial planning stage, the finance of the SRSSP would rely primarily on finance through IFIs. The optimum selection between these institutions was discussed thoroughly in the framework and the literature. In this case study the World Bank is selected due to these reasons:

- The Country Partnership Framework identifies 5 sectors to be the focus of World Bank operations: Healthcare, agriculture & irrigation, Social protection, *sanitation*, and Financial Markets.
- The largest IFI with most loans and grants for developing countries
- Extensive experience in financing similar projects (2 recent similar sanitation projects in delta were financed by the World Bank)

- Technical support this bank can offer with respect to the finance methods and financial planning

### VI.2.3 Stage 3: Check the Eligibility of the Project for IPF & P-for-R Financing

Now the World Bank has been identified as the IFI of choice to finance the project, but the Eligibility of the project is verified for each World Bank lending instrument before proceeding to determine which would be the optimum.

#### **VI.2.3.1 Development Policy Financing**

This instrument does not finance specific projects or programs, it is design to support high-level policy changes and structural adjustments. Accordingly, the SRSSP is not illegible for finance under this instrument.

#### **VI.2.3.2 Investment Project Financing Eligibility**

The World Bank operational policies dictate several legal, environmental, and social safeguards that would limit the use of IPF in certain occasions. The below checklist was devised as part of the framework and it was filled for the SRSSP project team as follows:

Policy Number	Description	Project Compliance
OP 7.50	Excludes Projects on International Waterways	✓
OP 7.60	Excludes Projects in disputed areas	✓
OP 4.01	Excludes projects that contravene the borrower country's obligations under international agreements	✓
OP 4.04	Prohibits the conversion or degradation of "critical natural habitats"	✓
OP 4.09	Excludes projects using certain categories of pesticides under specified circumstances	✓
OP 4.11	Excludes certain activities adversely affecting physical cultural resources	✓

OP 4.12	Excludes involuntary land acquisition absent specified pre-conditions	✓
OP 4.36	Prohibits significant conversion or degradation of critical forest area	✓
OP 4.37	Concerned with the Safety of Dams	✓

Accordingly, the project is illegible for IPF finance since it does not violate any of the aforementioned IPF safeguards.

### **VI.2.3.3 Program-for-Results Eligibility**

#### **High-Value Contracts**

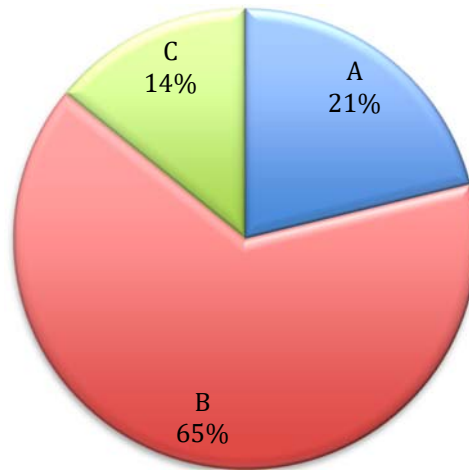
The Bank Policy and Directive issued for P-for-R provides certain thresholds for High-Value contracts (previously discussed in the literature review section). The interviewed experts recommended using the lowest threshold that corresponds for the highest overall risk which is \$50 Million. SRSSP project team has confirmed that the project in fact does not include any single contract that would exceed that amount.

#### **Category A Projects**

The P-for-R Bank Policy and Directive also dictate that the P-for-R does not finance projects that would be categorized by the bank as “Category A”. The proposed framework suggests three approaches for evaluating the project environmental category; *Indicative lists, Past Projects, and “A” vs “B” guiding criteria.*

The SRSSP falls under the sanitation projects category that is included in the indicative lists for both categories “A” and “B”. However, 65% of 637 World Bank sanitation projects were evaluated as “Category B” as opposed 21% assessed as “Category A”, as shown in the below figure.

## Environmental Categories for World Bank Sanitation Projects



**Figure 37 EIA Categories for WB Sanitation Projects (World Bank, 2017)**

It appears from this statistic that the project is more likely to be assessed as “Category B”, however, there is a need to examine the SRSSP in specific since each project has its unique nature. Accordingly, SRSSP characteristics were examined with reference to the “A” vs “B” *guiding criteria* previously described in the framework. These criteria were visited with the SRSSP project team and following was found.

Criteria	Project Team Feedback	Assessment
Impacts	Impacts are expected to be site-specific and can be easily controlled by standard measures. Impacts are mainly related to water quality hence they are non-diverse. Several sanitation projects were completed in the same area so no “unprecedented” impacts are expected.	B
Mitigation	The mitigation measures of impacts can be challenging but it is within the technical capacity of the project team	B
“EIA” breadth and depth	The required EIA is site-specific but a stakeholder consultation would be necessary.	B/A Borderline
High Risk Activities	The project includes major new construction but no hazardous material is expected to be used at any stage of the project	B

Scale & reversibility	The capacity of all WWTPs within the scope of the project is less than 135,000 m <sup>3</sup> /day. The capacity of “Category A” projects is typically more than 145,000 m <sup>3</sup> /day.	B
Number of Applicable Safeguards	The project was not found to trigger any of the World Bank Operation Policy Safeguards; e.g. no construction will be close to natural habitat or culturally valuable site and it will cause no resettlement for indigenous people. The only “flag” to be raised is related to the land acquisition component of the project which must be addressed thoroughly in the ESIA.	B

Since the SRSSP project was borderline between “Category A” and Category B”, the “scale” criterion with respect to previous projects was critical in deciding the project environmental category which was agreed to be “Category B”

#### ***VI.2.3.4 Stage 3 Output***

The project was found to be illegible for finance with both IPF and P-for-R instruments. Therefore, the optimum choice between both instruments will be discussed in the next stage.

#### ***VI.2.4 Stage 4: Choice of the Optimum Lending Instrument***

The proposed framework presents 4 considerations for the choice of optimum funding mechanism under the World Bank; Project Risks, the ability to establish scalable & measurable DLIs (in case of P-for-R), and the feasibility of the funding mechanism with respect to the forecasted cash flow.

##### ***VI.2.4.1 Risk Decision Support Tool Application***

The analysis of the conducted interviews established the importance of the associated risk of infrastructure projects as a decisive factor in choosing the optimum finance tool under the World Bank. Accordingly, SRSSP project team was interviewed to

assess the risks associated with the project. The feedback was inserted in the regression model proposed in the framework in order to link the project risk profile with the tool that best addresses these risks.

The below table summarizes the feedback of the project team along with the justification of their assessment for each risk.

**Table 11: SRSSP Risk Assessment**

SORT Risks	Expert Risk Assessment			Justification
	P	I	Severity	
Political and Governance	3	4	3.50	Moderate risk due to the DLIs related to the new tariff structure and the subsequent reduction of subsidies.
Macroeconomic	3	4	3.50	Moderate risk applicable to almost all infrastructure projects within Egypt due to recent reform measures.
Sector Strategies/Policies	4	4	4.00	A substantial risk because the design of the program includes major adjustments in the institutional arrangements, and changes the roles of subsidiary entities of the implementation agency. Also, one of the project objectives is to design a National Rural Sanitation Program and to reform the strategies of the sector at large. Internal resistance for such transformations and introduction of a new entity (PMU) will constitute major risks to delivery.
Technical Design/implementation	3	2	2.50	This risk is below average due to the nature of sanitation projects and the high technical capabilities within sector. Also, there is adequate capacity of calibers in the sector to deal with the effects of most technical risks. Furthermore, this risk was addressed by standardizing the design concepts by the help of experts in order to reduce such risks.
Institutional Capacity	4	4	4.00	A substantial risk as it was identified as a main challenge for achieving results in previous World Bank projects in this sector (ISSIP 1 & ISSIP 2)
Fiduciary Risk	4	4	4.00	Considerable risk according to sector professionals based on their experience with previous projects. Especially in this program as there are many objectives that are not "brick and mortar". However,

SORT Risks	Expert Risk Assessment	Justification
		this risk was partially mitigated in this project by creating a designated account for the project in the Central Bank to facilitate the tracking of disbursements and expenses. Another measure was to include clauses in some contractor contracts to pay suppliers directly.
Environmental/Social	3 3 3.00	A detailed ESIA study was carried out and it was found that sanitation projects with involving plants with similar capacities fall in Category "B".
Stakeholders	3 4 3.50	Risk is borderline substantial; this is because the program involves land acquisition which was previously identified as a main challenge in previous projects within sector. However, this risk was addressed by extensive public consultations with all relevant stakeholders
Liquidity	2 2 2.00	This risk is below average in this project since 25% of the loan amount was disbursed in advance, in addition to the "soft" DLIs, causing the project to maintain a positive cash flow.

The above risk ratings were inserted in the developed Risk-based Decision Support logistic regression model, and the output was  $0.9851 \approx 1$ , which corresponds to P-for-R as shown in the below figure, indicating that P-for-R is better suited to address the risks associated with this project.

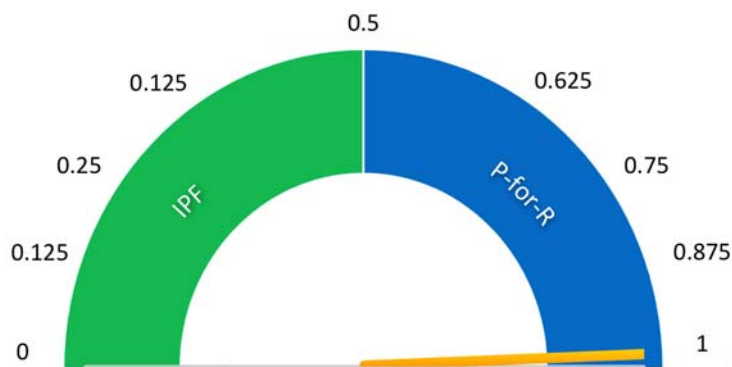


Figure 38 Risk-Based Decision Support Tool Output

The three highest rated risks were *Sector Strategies/Policies*, *Institutional Capacity*, and *Fiduciary risk*. The output of the tool is consistent with analysis of the interviews which reveals that P-for-R is particularly suited to address *Sector Strategies* and *Institutional Capacity* risks. *Fiduciary risk* the third highest ranked risk in the SRSSP, however, the project team indicated that this risk was considerably mitigated in this project by the following measures:

- Creating a designated account for the project in the Central Bank to facilitate the tracking of disbursements and expenses.
- Including clauses in some contractor contracts to pay suppliers directly.

#### **VI.2.4.2 Project Nature**

As previously discussed, the optimum choice of lending instruments for infrastructure projects cannot be solely based on the devised decision support tool. It is necessary to analyze the project nature and the challenges faced within sector to achieve development goals. According to the guidance provided by the World Bank, stresses the following:

- P-for-R is designed to cater for *programs* rather than specific projects.
- IPF is better suited to control challenges related to “*inputs, resources and technical implementation/design.*” On the other hand, P-for R is generally better suited to address risks related to “*lack of capacity to achieve results*”.

As previously stated, the SRSSP is a *program* comprising a group of projects that aim to increase and improve access to sanitation, which makes it a perfect match with P-for-R. Moreover, the respondents confirmed choice of P-for-R is generally suitable for the nature of SRSSP project as the *main challenge* faced in sanitation projects is the “*lack of capacity to achieve results*”.



### VI.2.4.3 Cash Flow Analysis

Since P-for-R does not disburse against specific expenses, it is vital to perform a preliminary cash flow analysis to ensure that there would not be any funding gaps in the project life-time. The projected cash in was obtained from the SRSSP World bank Project Appraisal Document, while the expected project expenses over project lifetime were estimated based on the project plan.

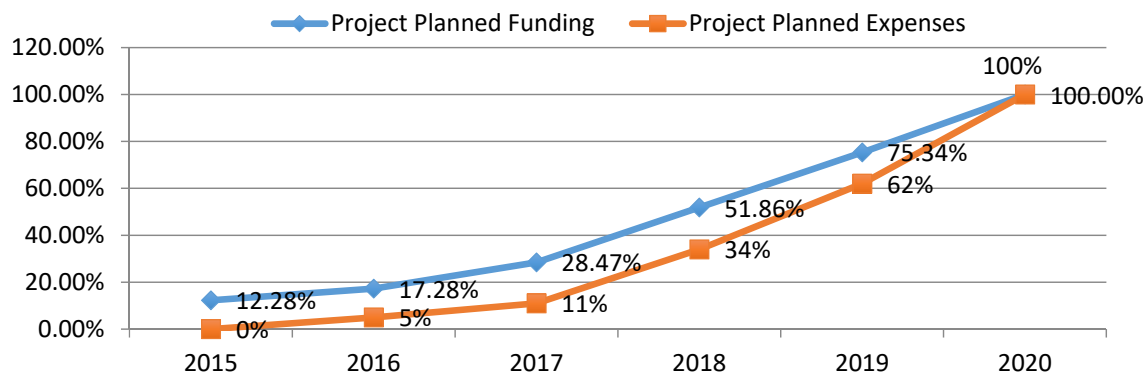


Figure 39: SRSSP Cash Flow Analysis

As demonstrated in the above figure, it can be concluded from the cash flow analysis that there are no funding gaps expected over the project lifetime.

### VI.2.4.4 Proposed DLIs

Disbursement Linked Indicators are a main pillar of P-for-R finance. The analysis of the project nature and risks favors the P-for-R tool, however, it is necessary to confirm that scalable and measurable DLIs can be established for the project. The below summarizes the DLIs that were included in the SRSSP project with their respective weights.

Table 12: DLIs for SRSSP project

DLI #	Description	Type	Purpose	Wt. %
1	Number of functioning Household Connections (167,000). Minimum % for Satellites (10%)	Access to services	Directly ensures increased access to sanitation, % for satellites ensures poorer households are included	40%
2	Initiate Central Government Fiscal transfers based on sector performance	Improved Systems	Provides a positive financial performance incentive for Water & Sanitation Companies	5%
3	Design and Implement Annual Performance Assessment System. Determine baseline scores and achieve target scores each year	Participatory Governance	The presence of such system ensures positive citizen inclusion in performance assessment of service providers. It directly improves financial performance and institutional capacity.	30%
4	Preparation and Approval of a new Tariff Structure to allow for project cost recovery	Improved Systems	Introduces Financial sustainability to projects within the sector. Will allow in the future for the involvement of private investors	10%
5	Establishment of PMU and a new national Rural Sanitation Strategy	Specific Program Outputs	Aims at extending the program benefits to the whole sector and other governorates.	10%
6	Establishment and Approval of Standard Operating Procedures for Land Acquisition for Rural Sanitation projects	Specific Program Outputs	Aims to simplify current mode of operation that involves multiple stakeholders. Will standardize the procedures for land acquisition across sector	5%

#### VI.2.4.5 Stage 4 and Final Output

It can be concluded that **P-for-R** is better suited for the SRSSP project for the following reasons:

- The output of the Risk-Based Decision Support tool shows that P-for-R is better suited to address the associated risks with this project, *especially Sector Strategies/Policies and Institutional Capacity*.
- The nature of the SRSSP being a *program* where the main challenge to achieve project objectives relates to *the capacity to achieve results*.
- The project team was able to establish *scalable* and *measurable* DLIs
- The project does not include massive upfront financing that exceeds the 25% advance payment provided by the P-for-R

### **VI.3 Framework Output Validation**

#### ***VI.3.1.1 Comparison with actual projects in the sanitation sector in Egypt***

In order to validate the output of framework, the output is compared to the actual choice in the SRSSP in addition to 2 other recent World Bank funded sanitation projects which are:

- Integrated Sanitation and Sewerage Project (ISSIP1)
- Second Integrated Sanitation and Sewerage Project (ISSIP2)

These two projects were chosen because they have similar objectives to the SRSSP, also located in Delta governorates, and they are fairly recent. Furthermore, these projects were financed by IPF while SRSSP is financed through P-forR, therefore, assessing the performance of these projects will reveal which instrument is more suitable for projects with this specific nature.

#### **SRSSP**

The output of the framework is consistent with the actual choice of lending instrument in the real project which favored **P-for-R**. The below figure is extracted from the Official Project May 2017 World Bank Implementation Status report issued 18 months after the project commencement (World Bank, 2017).

Overall Ratings		
Name	Previous Rating	Current Rating
Progress towards achievement of PDO	● Satisfactory	● Satisfactory
Overall Implementation Progress (IP)	● Satisfactory	● Satisfactory
Overall Risk Rating	● Substantial	● Substantial

**Figure 40: Extract from Official World Bank Implementation Status Report (World Bank, 2017)**

As shown in the above figure, the project performance was found to be “Satisfactory”. Moreover, the report confirms that the project is progressing with respect to all DLIs and 2 out of a total of 6 DLIs have been already achieved.

### **ISSIP1**

This is an IPF project that was executed in the Delta region over the period from July 2012 up to December 2015. This project was composed of 3 components:

- 1) Construction of centralized and decentralized sanitation systems
- 2) Development of a result-based performance monitoring system
- 3) Capacity building and institutional development

The World Bank issued a Final Implementation Completion and Results report on June 2016 with the following findings:

- The overall performance assessment for the Bank was “Unsatisfactory” and the Borrower (GoE) was “Moderately Unsatisfactory”.
- The below “Disbursement Profile” was included and it shows that low “Actual” disbursement over the different quarters reflects the low performance and achievement of results.

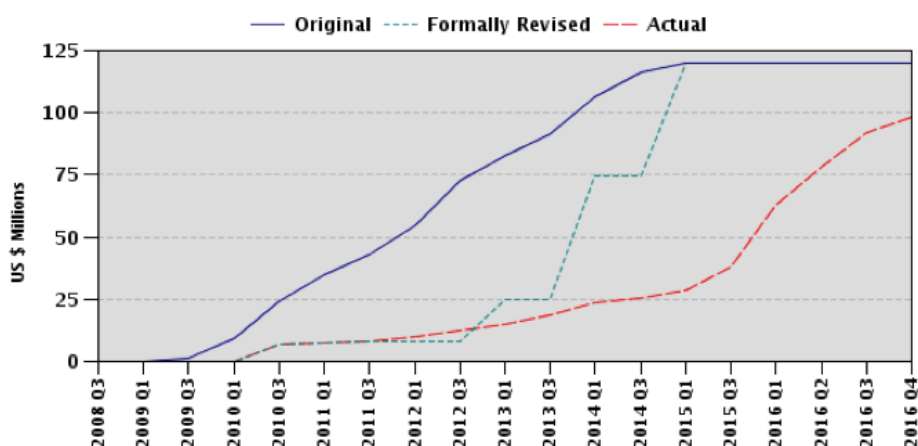


Figure 41: Project Disbursement Profile (World Bank, 2016)

- The project did not achieve the intended development objectives as revealed by the below Project Development Objectives Indicators

Table 13 ISSIP 1 Project Indicators Assessment (World Bank, 2016)

#	Indicator	Baseline	Actual	%
1	Number of households connected to centralized systems	69,000	13,300	19%
2	Households connected to decentralized systems	6,500	0	0%
3	Reduction of Water Pollution (BOD per Annum)	985.5	539	55%
4	People with access to "improved sanitation facilities"	379,500	66,500	19%

- The main obstacles identified by the Bank to have impeded the achievement of project goals were:
  - Insufficient capacity of the implementing agencies
  - Lack of Coordination between entities in sector, which is a sector strategies/policies risk issue
  - Resistance from communities and difficulties in land acquisition

- Delays in funding from sources other than the bank
- Delays in procurement due to unfamiliarity of the implementing agencies with the World Bank procedures.

It is clear from this assessment that ISSIP 1 did not achieve its goals, and it is noteworthy that the identified reasons for failure were addressed in the design in the SRSSP through dedicated DLIs. This would not have been possible under IPF which disburses against actual payments rather than DLIs. The below table demonstrates how the design of SRSSP addressed the main issues faced in ISSIP 1

**Table 14: ISSIP 1 Challenges and Corresponding DLIs in SRSSP**

ISSIP 1 Challenges	Mitigation in SRSSP
Insufficient capacity of the implementing agencies	DLI 3: Design and Implement Annual Performance Assessment System.
Resistance from communities and difficulties in land acquisition	DLI 6: Establishment and Approval of Standard Operating Procedures for Land Acquisition for Rural Sanitation projects
Lack of Coordination between entities in sector, which is a sector strategies/policies risk issue	DLI 5: Establishment of PMU and a new national Rural Sanitation Strategy
Delays in counterpart funding	DLI 2: Initiate Central Government Fiscal transfers based on sector performance
Delays in procurement due to unfamiliarity of the implementing agencies with the World Bank procedures	This issue is addressed by the choice of P-for-R which relies more heavily on government systems rather than the World Bank procedures

## **ISSIP2**

This is another World Bank IPF sanitation project in the Delta and upper region, it started in December 2012 and it is planned to be completed by December 2017. The project comprises three main components:

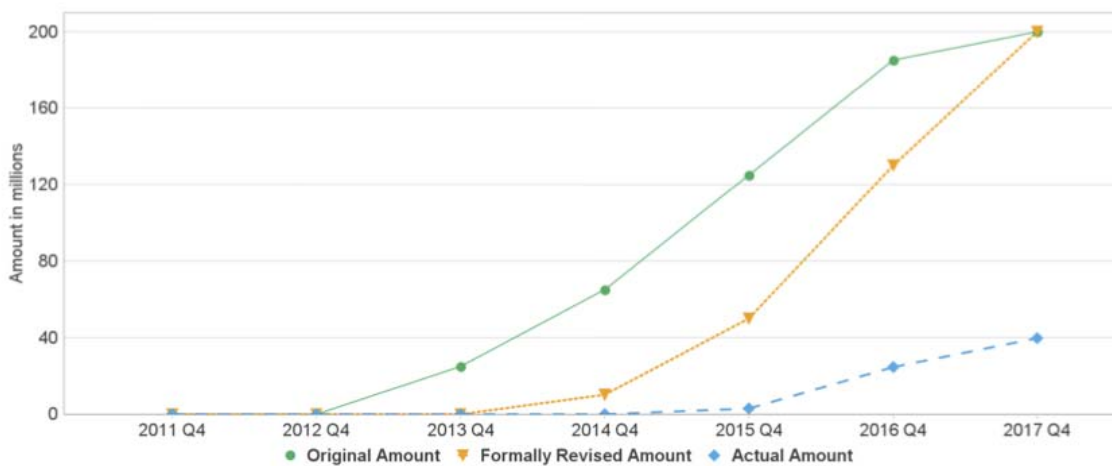
- Infrastructure systems in Menoufia and Sharkya
- Infrastructure systems in Assiout and Sohag
- Project Management

There are no detailed assessments available from the World Bank for the project since ISSIP 2 is still in progress. However, the below figure is an extract from the May 2017 implementation status report.

Overall Ratings		
Name	Previous Rating	Current Rating
Progress towards achievement of PDO	Moderately Satisfactory	Moderately Unsatisfactory
Overall Implementation Progress (IP)	Moderately Satisfactory	Moderately Unsatisfactory
Overall Risk Rating	Moderate	Substantial

**Figure 42 Extract from Official ISSIP 2 World Bank Implementation Status Report**

As demonstrated in the figure, the project performance is not satisfactory towards the end of the project, which was planned to be complete in December 2017. The below Figure is the disbursement profile of the project which is indicative of the actual progress versus the original and revised planned execution.



**Figure 43: ISSIP 2 Disbursement Profile (World Bank, 2017)**

The disbursement profile and the World Bank Overall Rating for the project performance both reveal that ISSIP 2 is not a successful project. While there is no official detailed assessment to explain the reasons for this unsatisfactory performance, this project was operating roughly in the same circumstances and timeframe of ISSIP 1. Therefore, it can be deduced that ISSIP 2 faced sector and institutional capacity challenges similar to those mentioned in ISSIP 1. The project

team was again unable to address project challenges while funding the project under IPF.

### VI.3.1.2 Comparison with previous P-for-R projects

Finally the suitability of the SRSSP for finance under P-for-R is also supported by the fact that 36% of P-for-R projects worldwide were in the same sector of sanitation. The below figure shows the distribution of P-for-R financing among the different sectors since its inception.

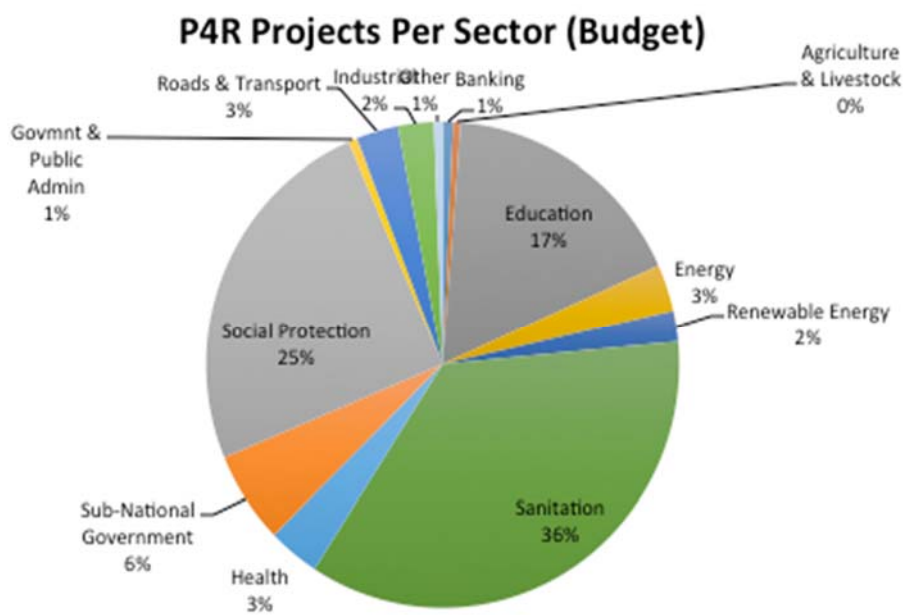


Figure 44: P-for-R Projects per sector - % by budget (World Bank, 2017)

## VI.4 SRSSP Case Study Conclusion

The purpose of the SRSSP case study was to determine the validity of the devised framework for the selection of optimum finance method for infrastructure methods in Egypt. The output of applying the framework was that P-for-R is best suited to finance the project.

The validity of this finding was tested against the actual method used to finance this project in real life and the projects actual performance. The actual tool used to finance the SRSSP was in fact the P-for-R and the project performance as per the latest



available implementation report was satisfactory. Furthermore, 2 other World Bank funded projects within sector (ISSIP 1 & ISSIP 2) were studied. Both projects are very close in nature to the SRSSP and were financed through IPF, however, these projects did not achieve their development goals successfully.

Therefore, the output of the framework which yielded that P-for-R is more suitable for financing the SRSSP, was found to be valid.

### VI.5 Giza North Power Project Case Study

The Giza North Power Project (GNPP) is a 1500 MW power plant consisting of two Combined Cycle Gas Turbines that depends primarily on natural gas. The scope of the project includes connecting the power plant to the national power grid and the connecting pipeline that supplies the plant with natural gas. The project estimated budget is \$1.4 Billion and it was expected to span five years.

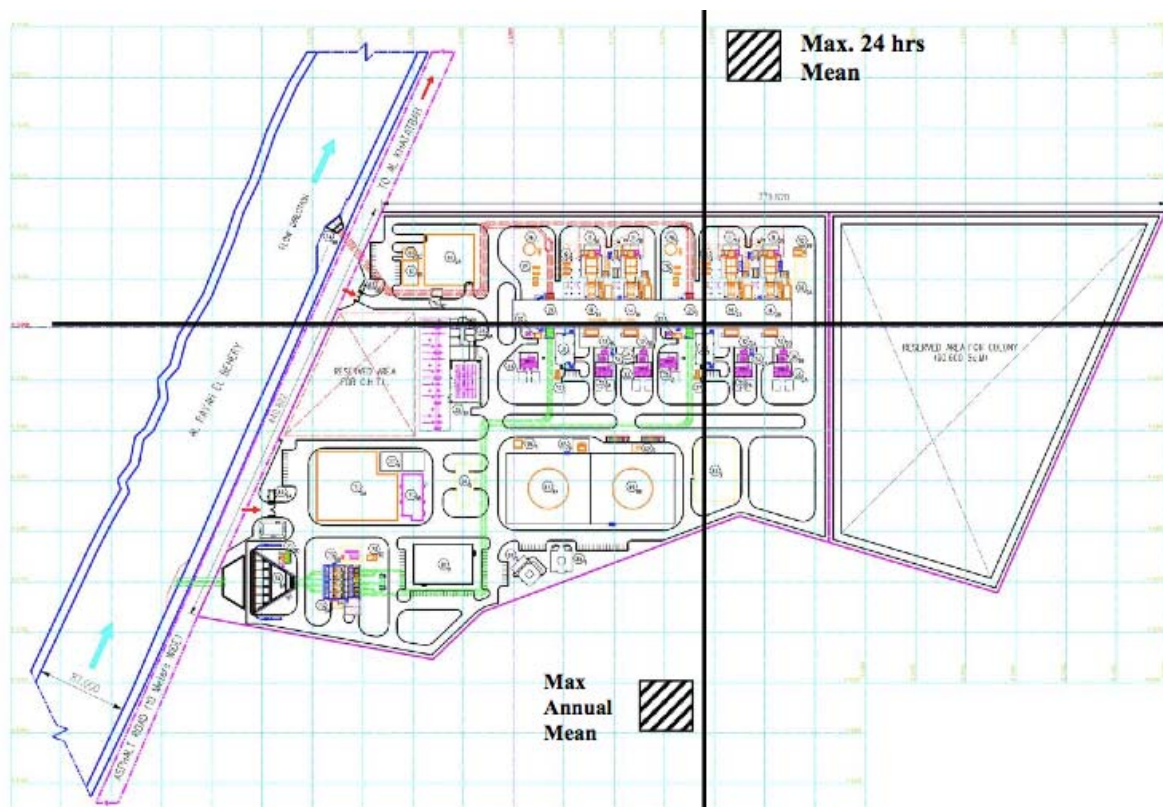


Figure 45: Giza North Power Project Layout (ECG, 2010)

### VI.5.1 Stage 1: Determining the Project Financing Structure

As previously discussed this stage is carried out by specialized project finance professionals. The output of this stage is controlled and summarized by form 1.2 included under Appendix III

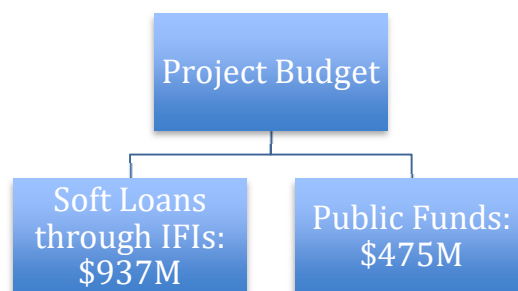
#### **VI.5.1.1 Financial Barriers**

Financial barriers often rely greatly on the country macroeconomic conditions, accordingly there is a great resemblance between the financial barriers faced in the sanitation and the electric power generation sectors. The main relevant financial barriers are:

- *Limited public funds* due to a considerable budget deficit. Such budget deficit will also mean that the government would seek *Soft Loans* to minimize the burden of debt on the general budget.
- The electricity service is subsidized which in turn limits the chance of attracting private investments.

#### **VI.5.1.2 Stage 1 output:**

The nature of the project and the sector financial barriers would make the government's priority is to seek soft loans to finance the project. The government would bridge the gap in funding through public funds due to the limited access to private investments. The Below figure shows the actual financial structure of the GNPP



### VI.5.2 Stage 2: Determining the Financial Institutions

As previously discussed the choice of IFI is usually an iterative process involving extensive negotiations with several institutions. However, the World Bank always stands out as the largest and most experienced IFI supporting development projects. The below table shows the actual IFIs contributing to the GNPP funding, and the World Bank is shown to be the major contributor.

IFI Name	Loan Amount
The World Bank	\$600,000,000
EIB	\$307,000,000
OPEC	\$30,000,000

### VI.5.3 Stage 3: Check the eligibility of the Project for IPF & P-for-R Financing

The previous stages defined the financing structure of the project and it was determined that the government would depend primarily on the World Bank to fund the GNPP. In this third stage the eligibility of the project for funding through IPF and PforR is examined.

#### ***VI.5.3.1 Investment Project Financing Eligibility***

Relevant IPF Operational Policies were reviewed and while several safeguards were triggered the project was found to be in compliance with the provisions of these policies.

Accordingly, the project is considered illegible to finance through IPF, and the below checklist summarizes the policies that the project was checked against.

Policy Number	Description	Project Compliance
OP 7.50	Excludes Projects on International Waterways	✓
OP 7.60	Excludes Projects in disputed areas	✓
OP 4.01	Excludes projects that contravene the borrower country's obligations under international agreements	✓
OP 4.04	Prohibits the conversion or degradation of "critical natural habitats"	✓
OP 4.09	Excludes projects using certain categories of pesticides under specified circumstances	✓
OP 4.11	Excludes certain activities adversely affecting physical cultural resources	✓
OP 4.12	Excludes involuntary land acquisition absent specified pre-conditions	✓
OP 4.36	Prohibits significant conversion or degradation of critical forest area	✓
OP 4.37	Concerned with the Safety of Dams	✓

### VI.5.3.2 Program-for-Results Eligibility

#### **High-Value Contracts**

Since GNPP is a high-risk project, the threshold defining "high-value" contracts can be considered as \$50 million. The project procurement plan was reviewed and the following packages were classified as "High-value":

**Table 15: GNPP High Value Contracts**

Package	Value (\$)	% of total cost
Combustion Turbine Generator	457,682,189	32%
Civil Works	192,587,721	14%
Heat Recovery Steam Generator	146,913,864	10%
Steam Turbine Generator and Condenser	174,443,508	12%
<b>Total</b>	<b>971,627,282</b>	

As shown in the above table most of the project is comprised of high-value packages that are not supported by P-for-R. However, Civil Works, Heat Recovery System and

Steam Turbine generator packages can be financed through the P-for-R because are all less than 25% of the total project cost. The Combustion Turbine Generator remains the only package that cannot be financed through P-for-R.

### **Category A Projects**

The GNPP is a non-renewable energy project that often classifies as an environmentally hazardous project. Nonetheless, *Indicative Lists, Past Projects, and Category A vs B Criteria* will be checked as recommended by the proposed framework in order to confirm the World Bank Environmental Category

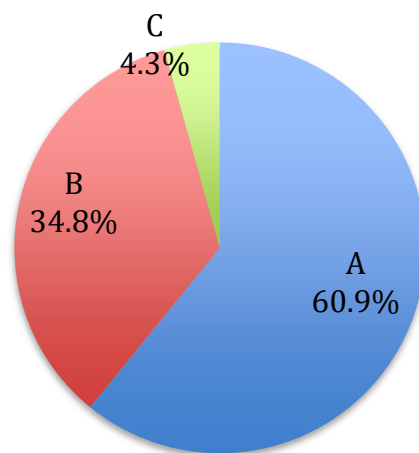
### **Indicative Lists**

Power stations and gas projects are on the top of the indicative list for Category A projects indicating that GNPP would most likely be ineligible for P-for-R.

### **Past Projects**

As shown in the below figure, 60.9% of Non-renewable Energy projects were classified as Category A projects, which further supports the classification deduced from the indicative lists.

**Environmental Categories for World Bank Energy Projects**



**Figure 46: EIA Categories for WB Energy Projects (World Bank, 2017)**

### “A” vs “B” Guiding Criteria

The examination of previous classifications of energy projects and environmental category indicative lists reveals that the GNPP would most probably be categorized as a Category A project, however, the GNPP must be assessed against project specific guiding criteria because each project is of a unique nature.

The below table summarizes the assessment of GNPP project against the guiding classification criteria

**Table 16: GNPP EIA Category Assessment**

Criteria	Project Team Feedback	Assessment
Impacts	The plant is located in an agriculture land adjacent to the Nile river, NOx and SO2 emissions are expected as a result of burning natural gas. Probably Irreversible Impacts on Air and Water Quality. Resettlement and Damage to crops due to construction and connection of new utilities and access roads	A
Mitigation	The mitigation measures of impacts can be challenging	A
“EIA” breadth and depth	Full comprehensive EIA required to assess impacts and mitigation strategies.	A
High Risk Activities	NOx and SO <sub>2</sub> emissions are expected during operation	A
Scale & reversibility	The project includes two 750 MW Combined Cycle turbines with considerable level of emissions.	A
Number of Applicable Safeguards	The following Safeguards were triggered by the project: <ul style="list-style-type: none"><li>• BP/OP 4.01 (Environmental Impact)</li><li>• BP/OP 4.12 (Involuntary resettlement)</li></ul>	A

#### **VI.5.3.3 Stage 3 Output**

It is concluded from this stage that the GNPP is *eligible for IPF* but *ineligible for P-for-R* as it is classified as a Category A project. Also, the project includes several high-value contracts that are normally not supported by P-for-R.

#### VI.5.4 Stage 4: Choice of the Optimum Lending Instrument

Before proceeding to stage 4 the lending instrument is already determined to be IPF. However, the project nature will be analyzed and the project risk profile will be inserted in the developed Risk Decision Support model in order to further test its validity and to confirm that IPF is in deed best suited for the funding the GNPP.

##### VI.5.4.1 Instrument Preference with respect to Project Nature

The GNPP is a single project (not a program or portfolio of several projects), and the project scope does not include capacity building activities or policy reforms. Moreover, the expected challenges to the achievement of project objectives relate to the control of inputs and availability of resources. These characteristics match the nature of projects that should be financed through IPF according to the World Bank guidance.

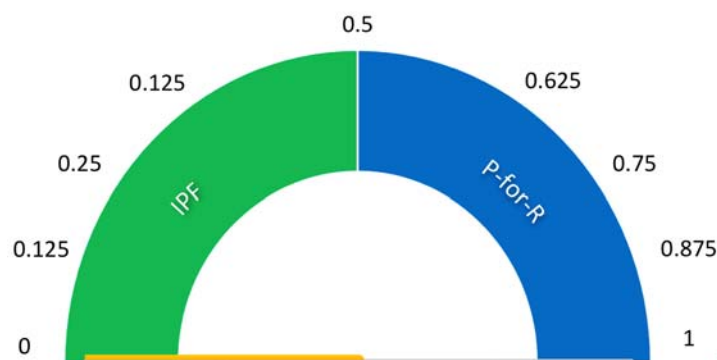
##### VI.5.4.2 Risk Decision Support Tool Application

The input of the GNPP project team was inserted in the Risk-based Decision Support Tool, the below table summarizes the project risk assessment and its justification.

SORT Risks	Expert Risk Assessment			Justification
	P	I	Severity	
Political and Governance	4	3	3.50	Moderate risk due to political turbulence at the time of award
Macroeconomic	4	3	3.50	Moderate risk applicable to almost all infrastructure projects within Egypt due to recent reform measures.
Sector Strategies/Policies	1	1	1.00	Low Risk due to the clear vision for sector goals and recent reforms in sector .
Technical Design/implementation	3	4	3.50	Considerable risk due the nature of the project which is highly technical. Also, the capacity of the power plant is relatively huge and most of the components are imported.
Institutional Capacity	1	1	1.00	Low risk due to adequate capacity demonstrated by sector through several projects. Professionals in the

SORT Risks	Expert Risk Assessment	Justification
		World Bank and the government side were both confident in the capacity within sector to achieve results.
Fiduciary Risk	2 1 1.50	Low risk, most of the major equipment is government procured, the problem is rarely faced in sector.
Environmental/Social	4 5 4.50	A detailed ESIA study was carried out and the project was classified as Category "A". This classification is due to expected NOx and SO <sub>2</sub> emissions and critical location.
Stakeholders	4 5 4.50	Risk is substantial; Project is located in an agricultural land, expected impacts include damage to crops and involuntary resettlement.
Liquidity	4 4 4.00	High Risk due major upfront finance requirement for expensive equipment.

The value yielded by the logistic regression model was  $0.00000472 \approx 0$  which corresponds to IPF as shown in the below figure.



Accordingly, the output of the framework was that GNPP can only be funded through IPF since it is a Category A Project. The analysis of project nature and the output of the devised decision support regression model confirmed that IPF is indeed suitable for the funding the GNPP project based on its overall risk profile.



## VI.6 Framework Output Validation

In order to validate the output of the framework, the result is compared to the actual case in GNPP. The GNPP was funded through a Specific Investment Loan which is now included under the IPF funding mechanisms.

As shown in the below figure, the World Bank rated the progress and the achievement of project goals as satisfactory in the latest implementation report for the project.

Overall Ratings		
Name	Previous Rating	Current Rating
Progress towards achievement of PDO	● Satisfactory	● Satisfactory
Overall Implementation Progress (IP)	● Satisfactory	● Satisfactory

**Figure 47: Extract from WB GNPP May 2017 Implementation Report (World Bank, 2017)**

Moreover, the report indicated that there have been savings in the project budget which will be utilized to fund gas connections for other power stations. Hence, it can be concluded that IPF is in fact the most suitable choice for funding this project.

## Chapter VII: Conclusion & Recommendations

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### VII.1 Research Conclusions

The focus of this research is IPF and P-for-R instruments provided by the World Bank through its subsidiary, the IBRD. Structured interviews were conducted with 21 international experts including World Bank professionals to identify the criteria for selecting the best suited financing instrument, and to what extent does each instrument address possible risks associated with any infrastructure project.

The following are the key findings deduced from the interviews:

- Financial Barriers and the risks addressed by each IPF and P-for-R have been identified as the driving factors for the optimum selection from these instruments.
- The main advantages of P-for-R is its goal oriented nature, and its reliance on the country existing systems which ensures the sustainability of enhancements in capacity of implementing entities.
- The main advantages of IPF are its strict control on inputs and its focus on technical design and implementation.
- IPF was found to address Technical Design& Implementation, Environmental, Fiduciary and Liquidity risks more effectively than P-for-R.
- P-for-R was found to be better suited than IPF to address Institutional Capacity, Sector Strategies & Policies and Stakeholder risks.

The literature and the findings from the conducted interviews were analyzed to propose a framework for the optimum selection between IPF and P-for-R. The framework is composed of the following stages:

- Stage 1: Determining amount to be financed through loans

- Stage 2: Determining the Financial institution
- Stage 3: Check the compliance of the project with IPF Safeguards and P-for-R Bank policy and Directive
- Stage 4: Choice of the optimum World Bank Lending Instrument

The first 3 stages summarize the literature and World Bank guidance for the selection of finance instruments. The main contribution of this research is in the fourth stage, where a risk based logistic regression model was derived from expert feedback to match project risks with the instrument that better addresses them.

The Sustainable Rural Sanitation Services Program (SRSSP) was chosen as the first validation case study for the developed framework. The SRSSP is a P-for-R funded sanitation program, located in the Nile Delta Area. The program aims to increase access to sanitation services and to improve the capacity of implementing agencies within sector. The output of the framework was to use P-for-R, matching the actual selection of instrument for the SRSSP project whose performance is considered satisfactory by the World Bank reports. In order to validate the output of the framework further, the assessment reports issued for 2 IPF financed projects in the same sector and location were examined (ISSIP1 and ISSIP2). The available World Bank reports considered the performance of ISSIP1 and ISSIP2 unsatisfactory. Furthermore, the challenges to project goals were actually considered in the DLIs for SRSSP project. Accordingly, the framework output was considered to be valid.

The framework was also applied on the Giza North Power Project (GNPP) as a second validation case study. The GNPP is an IPF funded Power Plant project, it consists of two combined cycle gas turbines that run on natural gas. The framework classified the project as a Category A project that is ineligible for P-for-R funding but can be financed through IPF. The project risk assessment was inserted in the risk decision

support regression model and the output confirmed that IPF is better suited to address the project risk profile. The framework output was found to match the actual choice of instrument for the GNPP. The latest implementation reports issued by the World Bank on GNPP rated the project performance and progress as satisfactory. Hence, it can be concluded that the framework output is valid.

## **VII.2 Limitations**

- While much of the interviewed experts have been exposed to infrastructure projects worldwide, the majority of their experience is in Egypt. Hence, conclusions drawn from this research cannot be generalized for other countries without further validation.
- Due to the novel nature of P-for-R and the relative scarcity of P-for-R, the interviewed sample is rather too modest for rigorous statistical and quantitative analysis.
- The financial risks and the criteria for choice of financial instruments vary greatly depending on the economic conditions and policies of the country at study. Egypt is currently undergoing massive economic challenges and reforms, hence many of the findings of this research might be not be valid if the circumstances changes. For example, the attraction of private investment was not considered a relevant criterion for the choice of instrument since most infrastructure services are subsidized. However, the general inclination is to reform the subsidy system to be more “demand oriented”.

### **VII.3 Future Work and Recommendations**

- This research serves as prototype for tackling the issue of optimum choice of financial instruments offered by IFIs. Similar research projects for IFIs other than the World Bank would be very beneficial.
- This research uses a logistic regression model that can easily be enhanced by expanding the interviewed sample to include more sectors and other countries.
- The weights used by the World Bank for calculation the overall risk assessment of infrastructure projects are currently left for the experience of bank staff. The findings of this research can be expanded to derive standard weights specific for each country and each sector.
- The findings of this research can be adjusted and further examined to develop a model that would predict the risks associated with World Bank projects for a certain sector or country.
- Neither IPF nor the P-for-R instruments were regarded as a tool to attract private investments; IFIs must expand the application of tools such as guarantees that have higher leverage
- Subsidized services have been identified as a key barrier to access private investments. The government must explore innovative alternatives such as demand-side subsidies that would allow the engagement of private investors.

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## Appendices

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