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ORIGINAL ARTICLE

Making public works work: A framework for initiating right public infrastructure investments

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ABSTRACT

Public works (PWs) in Jordan seek to deliver public services that contribute to socio-economic growth and service provision. A clear framework for initiating PWs investments is lacking in Jordan to meet the required level of development of the country. This work sought to develop a framework for delivering the right PWs investments. The study found that there are several steps that need to be followed to deliver a desired project's objectives. The study employed a qualitative method using semi-structured interviews. Besides the interviews, the document analysis approach was used and an extensive literature review was conducted. Experts in Jordan regarding PWs development were selected to participate in this study of developing a framework for the initiation of PWs investments. The study found that the framework should involve different steps and measures. They are integrated together to create a framework reflecting international practices in the context of Jordan.

Keywords*: public works; initiation framework; infrastructure investments; Jordan*

1. Introduction

It is extensively recognized that community development refers to expanding or realizing the possibility of creating the right infrastructure investments (Daly, 1990). Creating valuable infrastructure investments should meet the requirements of citizens by improving public facilities and services (Rădulescu et al., 2020). Delivering efficient public services can reflect on providing the desired living conditions for citizens and strengthen the community's livability (Bhattacharya et al., 2016; Wang, 2014; Zhang et al., 2014). Alongside this trend, the need for creating public infrastructures keeps growing. From this perspective, due to the increasing human pressure on urban spaces, the need for infrastructure investments is required, particularly in developing countries, including Jordan (Marcelo et al., 2016; Serebrisky et al., 2018).

Generally, public infrastructures covers two main groups, namely economic infrastructure and social infrastructure (El-Sawalhi and Sarhan, 2018; Infrastructure and Projects Authority, 2017; Palei, 2015; World Bank, 1994). It can be known as physical assets and include facilities of interrelated transport and energy systems, water and wastewater, environment and health, and telecommunication, as well as schools and government buildings, which provide certain specific commodities and public services (de Groot et al., 2022). Public

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infrastructures can be classified as large projects that consume vast amounts of resources, such as labor, materials, and equipment (Ministry of Public Works and Housing [MPWH], 2004). Therefore, a huge effort from governments worldwide is required to provide the service requirements of people and satisfy the demand to cope with the impacts of a growing population. Moreover, public infrastructure investments require massive amounts of money to be delivered. Therefore, estimating these amounts clearly is needed to compare the expected benefits from these investments and the benefits gained when they are in operation. In Jordan, more than 60% of the public fund in the region are spent on infrastructure investments, which employs around 30% of the labor force and creates around 33% of the gross domestic product (Al Emam, 2015). Consequently, Jordan has significantly invested resources in delivering public facilities that serve its citizens, made remarkable achievements for human development that maintain stability, and encouraged foreign and domestic investments (Government of Jordan [GoJ], 2015). Due to the huge investments in this sector, delivering the right infrastructure investments is required to meet the increased demand and provide valuable investments that reflect the country's development (MPWH, 2017). In line with providing the right public infrastructure investments, the decision-making at the government level should be subjected to the relation between the type of project, public needs, and priorities (Shiferaw and Klakegg, 2012). However, from a societal perspective, public infrastructure investments have been in fact criticized and judged unsuccessful. Existing practices in Jordan indicate that the implementation of public investments does not properly examine the public's needs and priorities (Ministry of Planning and International Cooperation [MPIC], 2017; MPWH, 2017). Moreover, millions of dollars are spent yearly for delivering public investments but they do not give the desired outcomes to the communities nor have positive impacts on the public. For example, the delivery of the Amman BRT system does not meet the requirements of the people. This investment first started in 2009, which was then postponed for years before being reworked recently. According to Williams and Samset (2010), some public investments can create more new problems than it solves. This is due to the missing legal and institutional frameworks to deliver the right public investments. In Jordan, in this regard, the most common problem is that there is no apparent link between the needed PWs and an effective delivery process for initiating them. In addition, the level of infrastructure development helps some public investments to be delivered even though they have no positive impacts on the communities.

Most often, in developing countries including Jordan, public investment projects are initiated by different agencies, which are considered the source of public investments. They include national and local governments, international organizations, politicians, nongovernmental organizations, etc. (Baum and Tolbert, 1985). These sources of public investment are criticized for lacking a method of organization or methodological arrangement. Usually, they adopt an unsystematic approach and follow a poor project selection methodology. This means that projects are not often developed from the policies of the country. Some countries do not even have an organized developed policy that can be served as a source for initiating projects (Shiferaw and Klakegg, 2012). However, despite all efforts from the government in delivering PWs investments in Jordan, it is still weak in meeting the required public services. This study contributes to knowledge by proposing a comprehensive framework that ensures the right PWs investments are initiated, as this framework is still missing in the context of Jordan. This paper, therefore, aimed to propose a framework that links the needed public investments and their delivery process to ensure that only investments that have positive impacts on the public are implemented in Jordan. This proposed framework can ensure that the

government provides the citizens a high level of PWs investments that to meets the citizens' requirements.

2. Background review

2.1. Public works in Jordan

Public works is the term used in Jordan to describe infrastructure investments. PWs in Jordan are considered one of the main contributors that improve the living standard of citizens and deliver effective public facilities and services (Sweis et al., 2008). The Ministry of Public Works and Housing of Jordan defines PWs development as the process of creating and delivering public engineering projects of various kinds (MPWH, 2004). These can include both buildings and infrastructure projects that serve the public's intended needs.

Recently, the PWs sector in Jordan is steadily developing, as influenced by interrelated factors, of which the most important are Jordan's overall political climate and safe investment environment (Jordan Chamber of Industry, 2022). Moreover, due to the political conditions in the region, there has been an increase in the percentage of immigration, contributing particularly to safety issues (Department of Statistics, 2016; "EU: Building relations with Jordan", 2014). This requires huge efforts to fulfill the needs and requirements of the public and satisfy the increased demand (MPWH, 2017). Jordan is leaping ahead and has started addressing and overcoming these challenges (Ministry of Environment, 2016). Thus, investing in public infrastructures has become a backbone of the Jordanian economy and one of the main important contributors to driving the national economy ("EU: Building relations with Jordan", 2014). However, the main objectives of most public infrastructures are to eradicate poverty and enhance community development. Nowadays, several public investments are underway in Jordan, with the objectives of either eradicating poverty or fulfilling the needs of society. However, the number of projects that cannot satisfy the needs and priorities of the public has also increased. These issues accompany some problems that are still unsolved, mainly the gap between governorates, the high level of the unemployment rate, and the relative decline in certain competitiveness indicators (MPIC, 2017).

Moreover, Jordan currently suffers from a rapidly increasing population growth, with an annual growth rate of 2.2% (Department of Statistics, 2022), which has become most concerning to the government in offering public facilities to the public. In fact, the public might consider that most of the delivered public infrastructure investments are unneeded, and hence new approaches and frameworks are required for initiating the right public investments. Therefore, this will require the government to find new and more efficient approaches and frameworks that deliver PWs investments that meet the requirements of the public. In the Jordanian context, the delivered facilities, infrastructures, and services are pioneering what are considered essential to be implemented in the absence of a relevant legal and institutional framework. Therefore, this research work was conducted to develop a framework for initiating PWs investments in the country.

2.2. Initiation of PWs in Jordan

The initiation of PWs is usually conducted in several steps and stages based on the generic framework shown in **Figure 1**. This framework is commonly undertaken for most PWs investments, wherein detailed standards are usually absent. Based on the documents collected regarding some

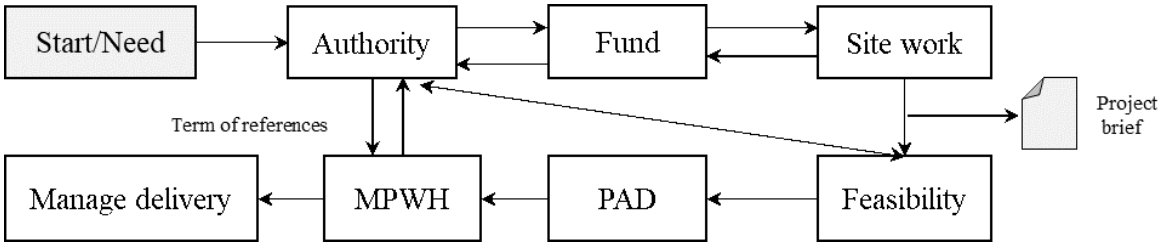

Figure 1. Initiating PWs in Jordan

projects in Jordan, most PWs projects are initiated following the same process (Ministry of Health [MoH], 2005, 2007; MPWH, 2005).

Figure 1 shows the simplest process for initiating PWs infrastructure investments in Jordan. The whole lifecycle stages for most projects are the same, but there are some differences in the number of steps, the complexities of the project, and the main processes that need to be followed (Office of Government Commerce [OGC], 2007).

According to Turley (2009), project initiation is the first stage of a project lifecycle, from which project objectives are derived. The purpose of initiating a project is to understand the work that needs to be done to deliver the required product (Turley, 2009). This understanding is needed before deciding whether to continue with the project or not. It is also where the opportunities or reasons for the project are identified, and a project is developed to take advantage of the opportunities (Shiferaw and Klakegg, 2012). Great projects often start with great hopes and expectations (Rădulescu et al., 2020). But if a project is not initiated correctly, it can drift off course and head for disaster (Turley, 2009).

PWs projects start by identifying the needs and opportunities at the local level of PWs investments. The government gives the approval for initiating a project to the ministry that is interested in the project based on the need for the project. The directing of a project then should be reviewed by the project board at the ministry to start preparing for the project by requesting to identify the project's site. This is important to identify the site for a project or the route of a project (for road projects) in order to request for the acquisition of the site work or to inquire if the site work is available. Then, the initiation of PWs investments is taken place. In initiating PWs investments, the scope and the objectives of the project can be identified and clarified. This is followed by the feasibility study and planning, before going directly to preparing the delivery and development using one of the available procurement strategies. In Jordan, the public procurement process is usually conducted under the traditional option (MPWH, 2005). All these processes should be reviewed by the project board at each ministry to make a decision on whether to accept the initiation of PWs investment or not.

PWs are usually created at two levels: national and local. At the national level, PWs investments refer to large-scale projects and are usually financed by the private sector or foreign sources. At the local level, PWs investments needed for local communities, such as for building schools, hospitals, roads, water and wastewater networks, etc., are usually funded by the government and in some cases by foreign sources. PWs investments in Jordan, whether delivered at the national or local level, follow the same steps. PWs investments in Jordan are started by identifying the needs and opportunities for improving the overall community (MPWH, 2005). Although PWs investments are

pioneering what are considered essential to be implemented, the absence of an effective and relevant framework for initiating PWs investments is clear. As such, each project is developed traditionally and only is realized due to the efforts of the ministry and its advisors. It should be realized that, at the national level, governmental policies can be formulated. Usually, policies determine the environment and the framework in which investments might take place (Cusworth and Franks, 1993). Policies can be considered as the source for initiating projects, where project initiation comes following a series of decision-making processes (MPWH, 2017; Greater Amman Municipality [GAM], 2017; MPWH, 2005). Therefore, delivering projects can be considered a tool for policy implementation (Shiferaw and Klakegg, 2012). This means putting policies into practice (Shiferaw and Klakegg, 2012). The following sections clarify how PWs investments are created in Jordan at both the national and local levels.

2.2.1. National level

Policymaking is defined as "a government's process that translates their vision into actions to deliver products and services that make desired changes in the real world through their outcomes" (OGC, 2007, p. 7). In Jordan, a national policy of Jordan was created to achieve the overall development of the country (MPIC, 2017). The national vision of Jordan 2025 is considered as a roadmap for the country in nearest future (GoJ, 2015). Its importance comes from its role in bridging the gap between the current situation of the country and the desired one. Thus, it becomes a general guideline for all public sectors in the country in formulating their strategy (GoJ, 2015). Consequently, each public sector in Jordan should first consider the national objectives that are included in the national vision of Jordan as inputs in formulating its strategy (GoJ, 2015). In line with this, each ministry in Jordan is in charge of formulating its strategy in order to translate the government's vision into actions based on the targeted scenario. This means that the strategic alignment between delivering PWs investments and the government's primary services and delivery objectives needs to be consistent (MPWH, 2017; GAM, 2017; MPWH, 2005). This can ensure that the national vision of the country is delivered. However, in Jordan, the most common tool for the decision-making processes to formulate a ministry's strategies and plans of action is sectorial planning based on previous efforts, such as the national vision of Jordan and any related development plans (GoJ, 2015; GAM, 2017; Ministry of Transportation, 2015; MPIC, 2016).

The national vision of Jordan includes strategic objectives that need to be achieved by each sector in the country. Moreover, due to the conditions which might be unpredictable, additional requirements and targets that are not included in the national vision of Jordan can be included by the government (GoJ, 2015). This means that, according to such circumstances that could occur over the time of implementing the national vision of Jordan, the government can change, add, or/and adjust some requirements related to PWs infrastructure development, investments, and more. In addition, previous efforts and related documents created by the ministries themselves can be considered as inputs for the ministries to develop their strategy. In some cases, previous efforts or targets that are not delivered can be considered as a new strategy to work on to meet the ministries' objectives and the service requirements of citizens. Implementing the national vision of Jordan means putting the policy into practice. However, the implementation requires resources, equipment, and money. Therefore, allocating the fund for implementing the policy is essential to ensure the government's vision and objectives are delivered in a way that improves the living standards of citizens and meets their service requirements. In this regard, allocating the fund in Jordan usually

comes from the General Budget Department (GBD). It is allocated based on the previous plans and activities of a ministry (GBD, 2015). Due to the gap in public funds, it falls heavily on the government to deliver its national vision and objectives. Therefore, funding from foreign sources is usually injected to feed the GBD to provide most PWs investments with the required fund. Once the fund is allocated by the GBD, the PWs investment strategy in Jordan starts by setting up a competent workgroup. The workgroup of policymakers should have a good reputation and skills to distinguish and clarify the best practices for policymaking. Several meetings are usually held at the national level among the group of policymaking members to discuss issues, objectives, and targets to develop an ambitious policy. In each meeting, the proposed policy is reviewed by the group of policymakers, and amendments are usually made by the group. The workgroup then should define and develop the organization policy that has to be followed. At this stage, different documents that relate to the organization's tasks and any governmental policies need to be reviewed. At different management levels in a ministry, brainstorming sessions are carried out to identify the external and internal conditions that affect the ministry's work. Therefore, environmental scanning is important to be conducted to clarify the strengths, weaknesses, opportunities, and threats (SWOT) and then these factors are matched together by conducting the SWOT analysis, where the score of each factor is weighted from the workshop sessions held by the strategic planning workgroup (GoJ, 2015). These weighted factors are set into a matrix to overcome weaknesses and threats that could affect the ministry's progress, and high weighted scores can be modified or ignored after studying the current situation of the country. Each public sector in Jordan then should work based on the targeted goals and formulate its own strategic objectives. For example, one of the targeted goals in 2025 is to expand the road network by 100 km based on the baseline of 2017, and hence the MPWH becomes in charge of working to achieve this target (GoJ, 2015). The workgroup evaluates the outcomes from the analysis and then updates the existing vision of the ministry based on the outcomes from each meeting. The sectorial and strategic objectives then are linked with the related national objectives that come up in the government's plans and development guidelines (GoJ, 2015). To achieve the targeted objectives, each objective is linked with key performance indicators to measure its achievements. The workgroup then drafts a strategy for the MPWH and then presents it to the staff and major partners (internal and external-public stakeholders), taking their feedback to modify the strategy based on the actual need for PWs investments.

2.2.2. Local level

Delivering PWs investments is an essential process to translate the strategic objectives of ministries into reality on the ground (Al-Balqa Governorate, 2016). Shiferaw and Klakegg (2012) argued that, in the need to achieve the desired outcomes by delivering the required PWs investments, it is crucial to study the current situation that the country has already reached. As a result, creating PWs investments should start by identifying the need for a project and linking it with the targeted objectives that are desired to be achieved. The proposing and initiating of PWs investments in Jordan, however, are not carried out by conducting the environmental analysis of the community in order to identify issues and then propose solutions. There is no specific process to be followed for proposing and initiating PWs investments (Alkhetan, 2017). The traditional process, which is dominantly followed, creates inequalities of opportunities in the country, including human intervention, social pressure, and other observed issues (Al-Balqa Governorate, 2016; GAM, 2015).

Moreover, different practices are seen in developing countries for proposing PWs investments,

such as proposals outlined by politicians who want to bring these investments to their communities (Alkhetan, 2017; Shiferaw and Klakegg, 2012). In other words, any parliament member at each governorate can inform the government that there is a need for improvements on PWs and for developing some public facilities and then include these investments in the government's priorities ("The MPs calls for raising", 2016). These practices, however, would not ensure that the strategic alignment between the government's national objectives and the reality on the ground is consistent. The evidence can be realized from undeveloped areas and communities across Jordan, bringing more issues rather than investments for development to the country. PWs investments can also be identified and prioritized based on the feedback from the operating processes of the assets and facilities (MPWH, 2017, 2022). Based on the feedback, any deficits with these assets and facilities can encourage the government to enhance its performance (MPWH, 2017, 2022).

However, the variety of inputs for each ministry for creating its investment strategy might have some cross-interests. In fact, the defining of project objectives is not given sufficient attention when public investment projects are initiated based on the national vision of the country. Usually, project proposals are set based on the interests of decision-makers (Shiferaw and Klakegg, 2012). This means that ministries cannot understand which proposal is the most prioritized to be delivered within the specified timeframe and available budget ("The MPs calls for raising", 2016; Alkhetan, 2017). In addition, the national vision's own roles as inputs are many and present different perspectives in different communities, and this can make ministries miss the government's objectives. Therefore, local communities in Jordan are not being developed on the same level due to different inputs, lack of funds, or lack of power of those in charge of bringing PWs investments to their local areas (World Bank, 2016). At this stage, all projects that are included in a ministry's strategy might be delivered based on the priority and availability of funding resources. Once the needs are prioritized for PWs investments, the relevant ministry takes the role of managing the delivery under public procurement.

3. Literature review

The global frameworks for initiating PWs were studied extensively in this work through a literature review in order to develop a general framework for Jordan in initiating the right public infrastructure investments. In Jordan, this framework is missing due to a traditional way of initiating the required public investments. Indeed, studying the initiating phase of PWs investments is crucial to ensure that public investments are delivered successfully to meet the desired needs of citizens. In this work, several studies that focused on developing the framework for the initiation of PWs investments were reviewed.

Shiferaw and Klakegg (2012) proposed a model that shows how public investment projects are developed. The model determines who oversees the development activities in the project. Through the strategic plan of the government, projects are initiated from the policy direction. The policy direction of the state is responsible for addressing public needs. A system analysis procedure that is developed should illustrate the selection of the right project. Moreover, it should formulate the problems, identify alternatives, design and screen alternatives, predict outcomes, and compare and rank alternatives. It is an iteration circle that reforms the analysis of problems and alternatives to initiate the right project.

Another framework for project initiation is called the governance system. It was developed by

the Norwegian government in 2000 (Klakegg, 2010). It was designed for major public investments in Norway to improve the quality of decision-making (Klakegg, 2010). The delivery of public investments follows logical sequences of adopting the framework for decision-making. It contains two main gates: the first one focuses on the concept of the rational choice of the project, while the second gate focuses on the needs assessment and the analysis of alternatives. On the other hand, British Standards Institute (BSI, 2010) proposed a system to be followed in project preparation. It consists of several layers, which contain several steps and directions to be followed. The first step is formulating specific problems associated with project initiation. Usually, problems can be identified by conducting a needs assessment and reviewing the government's policy and its directions. Omodan and Abejide (2022) supported the argument that conducting an inclusive infrastructure needs assessment must be geared towards a reformed approach of people's satisfaction. As a result, formulating objectives and devising solutions that can satisfy the requirements of the public (Klakegg, 2010). In parallel, operational uncertainties are also assessed and analyzed. Alternative solutions, including zero alternatives, are identified and evaluated. As a result, alternatives that would derive the desired outcomes are only developed.

Furthermore, in the UK, a structured project management method called PRINCE2 was developed (Turley, 2009). This method is concerned with understanding investments that need to be made prior to delivering the end products. This understanding is needed before deciding whether to continue with the investment or not. The process consists of structured tasks that can be considered crucial components for effective management and direction of a project to successfully achieve the goals of the project. The model contains seven interconnected processes. Each process is activated by the decision of who is in charge to start a project. The model illustrates the sequence of processes and shows which level of the project management team is responsible. The initiating of an investment is oriented on each project towards gaining the authorization necessary for initiating the project. As a result, authorization constitutes the trigger for initiating projects.

The UK Office of Government Commerce developed a quality assurance system named the Gateway Review Process (GRP), which can check the successful progress of projects at specified checking points before progressing to the next step (OGC, 2007). The system provides assurance and support for the relevant decision-makers (OGC, 2007). Consequently, to effectively deliver the intended benefits and desired objectives of PWs, the developed system employs different techniques for the beneficiaries. In the developed system, projects are assessed by independent professional bodies based on their experience. In addition, the system is designed to provide independent guidance to important stakeholders of the projects on how best to ensure that the projects are successful.

Despite all these efforts worldwide, there is clear evidence that, in the context of Jordan, a comprehensive framework is still not in place to ensure the right PWs investments are initiated. Therefore, an initiation framework needs to be developed to improve the delivery capability of PWs investments in Jordan. This may ensure that the country's target of meeting the desired needs of its citizens more efficiently is achieved. Consequently, the framework needs to be established.

4. Methods and materials

A single research method is not suitable to solve all research problems (Gill and Johnson, 2002).

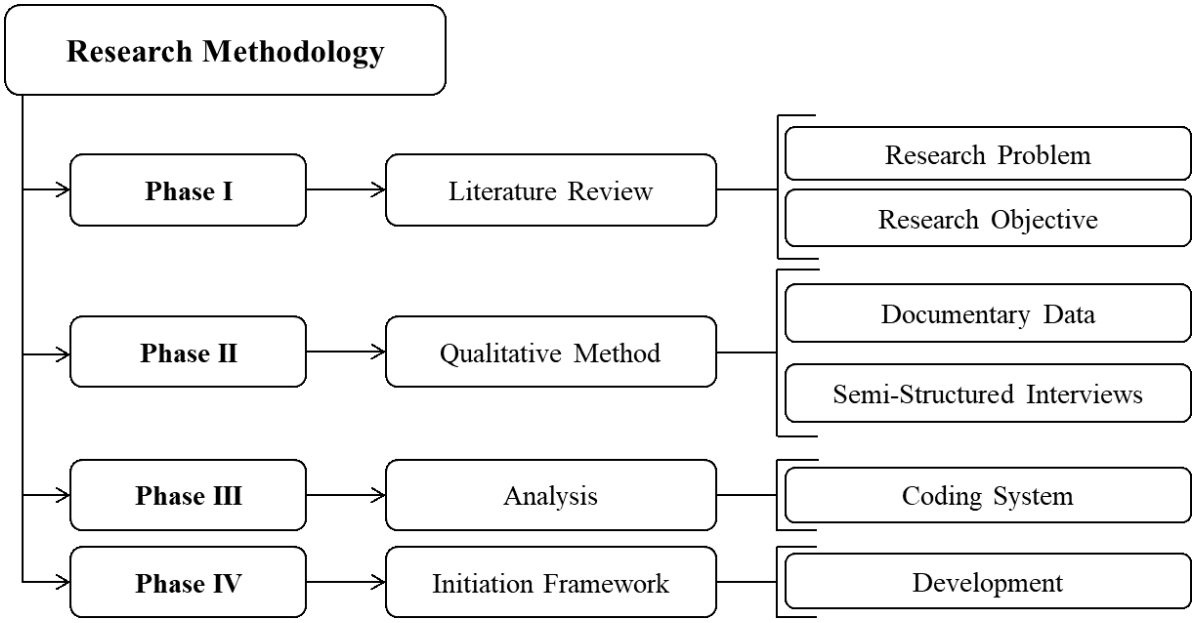

Figure 2. Research methodology's structure

Denscombe (2014) supported this idea when he stated that a selected research method should fit a specific part of the investigation of a research problem. Due to the limited works on the subject, this study conducted an in-depth investigation of existing PWs development practices in Jordan, followed by an extensive review of documentary data and literature. Consequently, the qualitative method was employed to develop a framework for initiating the right PWs investments. **Figure 2** shows the research design of conducting the research study.

4.1. Documentary data

Documents, including archival documents, were used in this research study. It is considered one of the data-collecting techniques (Fellows and Liu, 2015; Naoum, 1998). This technique is appropriate to collect secondary data. In this study, it was used besides reviewing the literature and conducting fieldwork interviews. This can enable the triangulation between the data collection techniques, which can give reliability to the research study (Yin, 2013). The collected data were related to the completed PWs projects in Jordan in order to explore the existing practices of initiating them. Moreover, the final evaluation reports of completed projects were obtained to collect the secondary data. Furthermore, the PWs system 1986 was used to clarify the current steps of Jordan's government processes of initiating its public investment projects. The data collection process started by investigating the main documents related to the research study. These documents were reviewed carefully on how PWs were delivered by the government. A literature review is usually conducted as a process to investigate existing works that had been done on the specific topic of the research (Hart, 2018). In addition, it can build a viewpoint about the current situation of the specific research topic to be investigated and compare the issues, the ideas, and the differences between the works (Hart, 2018). In this study, the function of this technique was to gather information about the main research topic area, which was public works.

4.2. Semi-structured interviews

In this stage of the study, interviews were carried out. The justification for using semi-structured

interviews was that this research study was qualitative, and hence was exploratory in nature and required in-depth and rich data. According to Bartlett and Payne (1997), the most appropriate tool to conduct an in-depth investigation is by using semi-structured interviews. In the present research study, semi-structured interviews were employed to collect primary, rich, and in-depth data (Fellows and Liu, 2015). This tool emphasized how and why the phenomena in Jordan are happening, with a list of questions related to the research topic (Fellows and Liu, 2015) to achieve greater insight into the development of a framework for initiating PWs investments. A total of nine respondents were contacted for conducting the interviews. The interview questions were designed to cover the following aspects, as follows:

- Development of steps, procedures, and measures related to existing PWs initiation practices in Jordan.
- Validation of the proposed framework for initiating PWs investments in Jordan.

Due to the pandemic of COVID-19, the interviews were all conducted remotely. As a result, two of them were conducted over the telephone and the remaining via Skype. The interviews were all transcribed and analyzed using a qualitative analysis method.

4.3. Sampling procedures

Despite the suitability of using questions, interviews tend to use a small sample size in contrast to questionnaires (Fellows and Liu, 2015). This research study was inductive and can be conducted using just a few participants. According to Easterby-Smith, Thorpe, and Lowe (2002), this kind of research work is carried out to collect primary data with a small sample of participants. It can establish several views about a phenomenon when working with qualitative data. The selection of participants for inclusion in the sample tends to be based on non-random sampling (Denscombe, 2014; Hammarberg et al., 2016; Ritchie et al., 2003). Therefore, it is essential to note that a small sample only works for qualitative research studies when purposive sampling occurs (Ritchie et al., 2003). Indeed, there is no specific sample size that is appropriate to be used when conducting interviews, and hence most researchers consider that, in qualitative research works and as a rough guide for interview studies, the saturation of data can probably be reached using their judgment (Boddy, 2016; Creswell, 2013; Dworkin, 2012; Hancock et al., 2009; Marshall et al., 2013; Morse, 2000; Thomson, 2010). As a result, in this study, only nine participants were interviewed to collect intensive and rich data. The justification was that even though the researcher contacted many potential participants, only ones who have rich and wide experience were filtered to be part of the research study. In addition, the only ones who agreed to be interviewed were nine participants. Moreover, the research study started the investigation by developing firstly the existing framework for the initiation of PWs in Jordan and then comparing it with those in place internationally. As a result, the analysis derived some missing elements in the existing framework for PWs initiation, which would otherwise not be obtained from studying only the secondary data using archival documents worldwide, to leverage them in the context of Jordan. Therefore, it was not expected for the researcher to interview a lot of participants, since the missing data were not that many. Lastly, after the analysis started, the developed framework then became fully saturated and developed in its structure and process, and no more data were needed. At this point, the researcher stopped the investigation with only nine participants, who provided in-depth and valuable data that were employed to propose the framework for the initiation of PWs investments. As a result, there was

Table 1. Experts' information profiles

Expert Code	Job Title	Years of experience	Interview duration	Method
P1	Director	19	60 min	Skype
P2	Engineer	15	20 min	Telephone
P3	Consultant	17	55 min	Skype
P4	Director	20	70 min	Skype
P5	Secretary Manager	22	55 min	Skype
P6	Financer	17	25 min	Telephone
P7	Director	19	60 min	Skype
P8	Engineer	15	45 min	Skype
P9	Director	17	55 min	Skype

no need for further interviews and expanding the selected sample of interviewees. The participants' profiles are given in **Table 1**.

The purposive sampling technique employed a group of interviewees who have been working in the PWs sector in Jordan. The sample of interviewees was classified as experts in the field of PWs in Jordan. Experts are expected to know more about the subject of study than others (Sourani and Sohail, 2013). Therefore, usually, experts are not randomly selected and they should be well acquainted and have wide experience in the related research topic (Keeney et al., 2001; Sourani and Sohail, 2013). In this research study, the sampling technique was carefully employed to select participants from both the public and private sectors. The participants had to be knowledgeable about the initiation PWs investments in Jordan. As a result, the selected knowledgeable people were those who can answer inquiries and have good working records in the initiation of PWs investments in Jordan. They were not selected randomly, as typically occurs in the quantitative approach, but based on those who already have a wide experience. Indeed, the sample of experts enabled rich and in-depth information to be obtained about the topic. This group of experts included stakeholders from different fields, who are engineers, directors, a consultant, a secretary manager, and a financer. The experts who can contribute to the study were selected based on specific criteria:

- Those who have a high reputation related to PWs investments proposed by the Ministry of Public Works and Housing, the Ministry of Planning and International Cooperation, and the Jordan Engineers Association.
- Those who have solid and relevant years of experience in initiating PWs investments.

Due to the need for a targeted group of participants in this study, the researcher searched for participants in the field of PWs who could meet the identified criteria. Potential participants were tested against the identified criteria, and only those who passed the test were included.

4.4. Data analysis

The qualitative research study provided subjective data (Naoum, 1998). This refers to opinions and attitudes about specific issues concerning the initiation of PWs investments in Jordan. As a

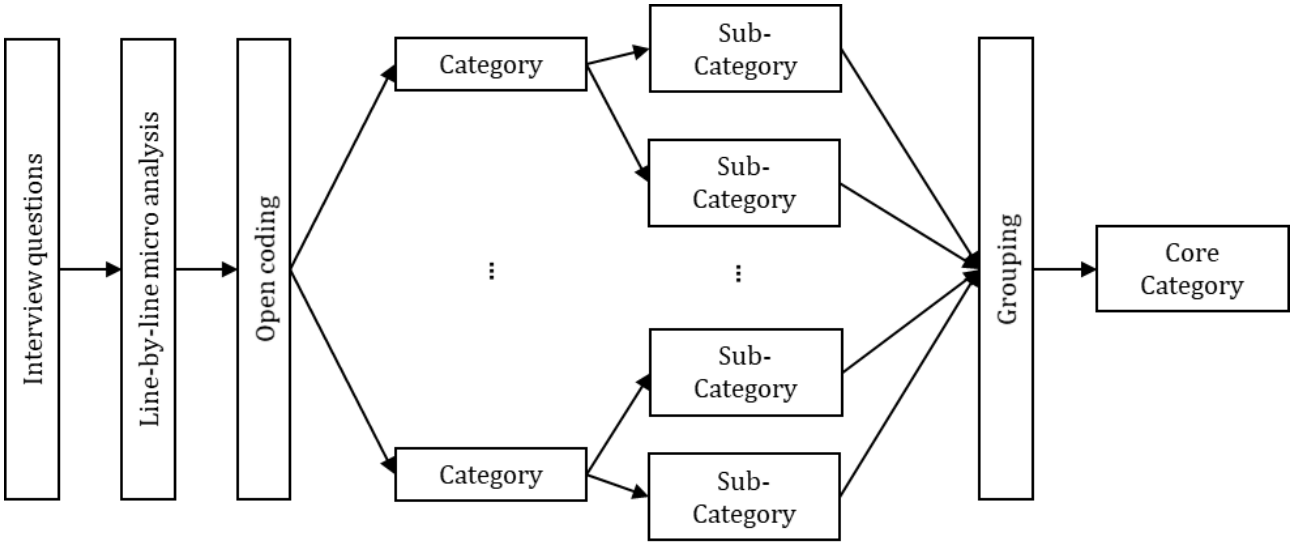

Figure 3. Data analysis process

result, the vast amount of collected data should be analyzed using the qualitative analysis process, as shown in **Figure 3**. It illustrates the overall steps that were followed for analyzing the obtained data from archival documents and the literature and from conducting the interviews in the fieldwork study.

In analyzing qualitative data, the coding technique was used. The coding process is considered as the heart of qualitative research. It is the analytical process through which data are broken down, conceptualized, and grouped into the form of theory (Strauss and Corbin, 1998). The analysis is likely to be carried out when the entire data have been collected. The analysis is related to the unit of data, which is related to either word, graph, or sentence. This research used the coding technique and employed sentences and words as the units of analysis that describe the main issues. The data analysis process consisted of two main stages. In the first stage, the obtained raw data collected from secondary sources, such as the available documents, were studied. In the second stage, the data collected from the interviews were studied.

The massive amounts of data collected were then analyzed. The data analysis process involved studying the raw data obtained from several collection methods, which were the literature review, interviews, and documentary data review. At both stages, a line-by-line microanalysis was employed to analyze the data provided from the documents. The processed data then were broken down into sets of incidents and grouped into appropriate categories. Then, theories were built through abstract definitions and statements. In each method of data collection, analysis was required. In this stage, the data gathered using each method were analyzed using appropriate qualitative analysis software, such as Nvivo 10. Most of the gathered data from the interviews, the literature, and archival documents were qualitative, which then were coded to develop a framework for initiating PWs investments in Jordan. The analysis might derive dozens of concepts. The final stage of coding was developing these categories in terms of properties and dimensions. The process of coding would continue until the saturation of categories was reached. Typically, categories resulting from conceptually similar terms and meanings are grouped under more abstract concepts that refer to the outcome of events and actions (Strauss and Corbin, 1998). Hence, the developed categories

and sub-categories in this study were grouped under a specified core category. This resulted in the development of the framework for initiating PWs investments in Jordan, which was the aim of the research study.

5. Findings and discussion

The findings of the research study were all derived from reviewing the documentary data both from Jordan and worldwide, data from the literature, and lastly key findings from the semi-structured interviews. The massive amounts of data were used to develop a framework for initiating PWs investments in Jordan. It can be used at the pre-project stage, when the project is still developing its scope, objectives, and outcome evaluation. Consequently, the obtained findings were divided into three lists, as shown in **Tables 2**, **3**, and **4**, which refer to findings from the analysis of documents, from reviewing the literature, and from conducting the semi-structured interviews, respectively. In the first list, the data, which were obtained from documents, were used to propose an initial version of the framework for the initiation of PWs investments. The main elements gained from analyzing the documentary data are listed in Table 2.

The second list of findings was obtained from conducting an intensive review of the literature for the main research elements both in the context of Jordan's public sector work and international practices. First, the existing PWs initiation practices in Jordan were identified from the literature and documentary data. Then, worldwide practices were identified by considering the existing frameworks that have been developed so far. This was to leverage these practices in the context of Jordan. The main key elements of the existing frameworks were identified properly by referring to project delivery stages, stakeholder involvement, and the delivery steps of PWs investments in Jordan. Table 3 shows the elements gained by reviewing the literature.

In this stage, the findings obtained from the semi-structured interviews were employed to develop the intended framework. The interviewees were chosen based on their experience in initiating PWs investments. As a result, different issues were explored in-depth with the experts to develop an initial framework for initiating PWs investments in Jordan. In fact, the interview questions enabled the interviewees to share their knowledge and experience regarding the framework for initiating PWs investments. Their opinions and attitudes were provided openly and broadly. The analysis used a thematic approach by coding similar gathered data with an appropriate theme. The data obtained

Table 2. Findings obtained from documentary data

Category	Sub-Categories	Deliverables	References
Project need	• National strategy • Related efforts	Terms of references	GOJ, 2015
Authority decision	• Whether to proceed with project or not	-	MPWH, 2004
Financing	• Ministry of Finance • Ministry of Planning and International Corporation	-	MPWH, 2004
Feasibility	• Site work	Project brief	MPWH, 2005
Project delivery	• Project appraisal	PAD	MoH, 2005, 2007

Table 3. Findings obtained from literature review

Category	Sub-Categories	Deliverables	References
Project need	• Identify business needs • Approving project • Reviewing project outcomes	• Project brief	BSI, 2010; Klakegg, 2010; OGC, 2007; Priemus, 2008
Project direction	• Request for direction • Request for decision • Undertake comprehensive assessment	• Outline business case	BSI, 2010; OGC, 2007; Priemus, 2008
Authority decision	• Identify site project • Begin project • Project decision	• Business case • Decision letter	BSI, 2010; Priemus, 2008
Feasibility	• Justification • CSFs	• Full project brief • ESIA report • CBA report	OGC, 2007
Financing	• Ministry of Finance • Ministry of Planning and International Corporation	• -	MPWH, 2004
Project delivery	• Project appraisal • Planning • MPWH	• PAD • Procurement strategy	BSI, 2010

Table 4. Findings obtained from conducting semi-structured interviewees

Category	Sub-Categories	Deliverables	Participants
Project need	• Identify business needs • Approving project • Reviewing project outcomes	• Project brief	P1–3, P7–9
Project direction	• Request for direction • Request for decision • Undertake comprehensive assessment	• Outline business case	P3–6, P8
Authority decision	• Identify site project • Begin project • Project decision	• Business case • Decision letter	P2, P5, P7–9
Feasibility	• Justification • CSFs	• Full project brief • ESIA report • CBA report	P1–4, P7–8
Financing	• Ministry of Finance • Ministry of Planning and International Corporation	• -	P1–9
Project delivery	• Project appraisal • Planning • MPWH	• PAD • Procurement strategy	P2–3, P6–9

from the interviews were coded and used to develop and feed the proposed framework for initiating PWs investments more precisely and more broadly. The findings obtained from an in-depth analysis of the collected data from the semi-structured interviews, classified into categories, subcategories, and deliverables, are shown in Table 4.

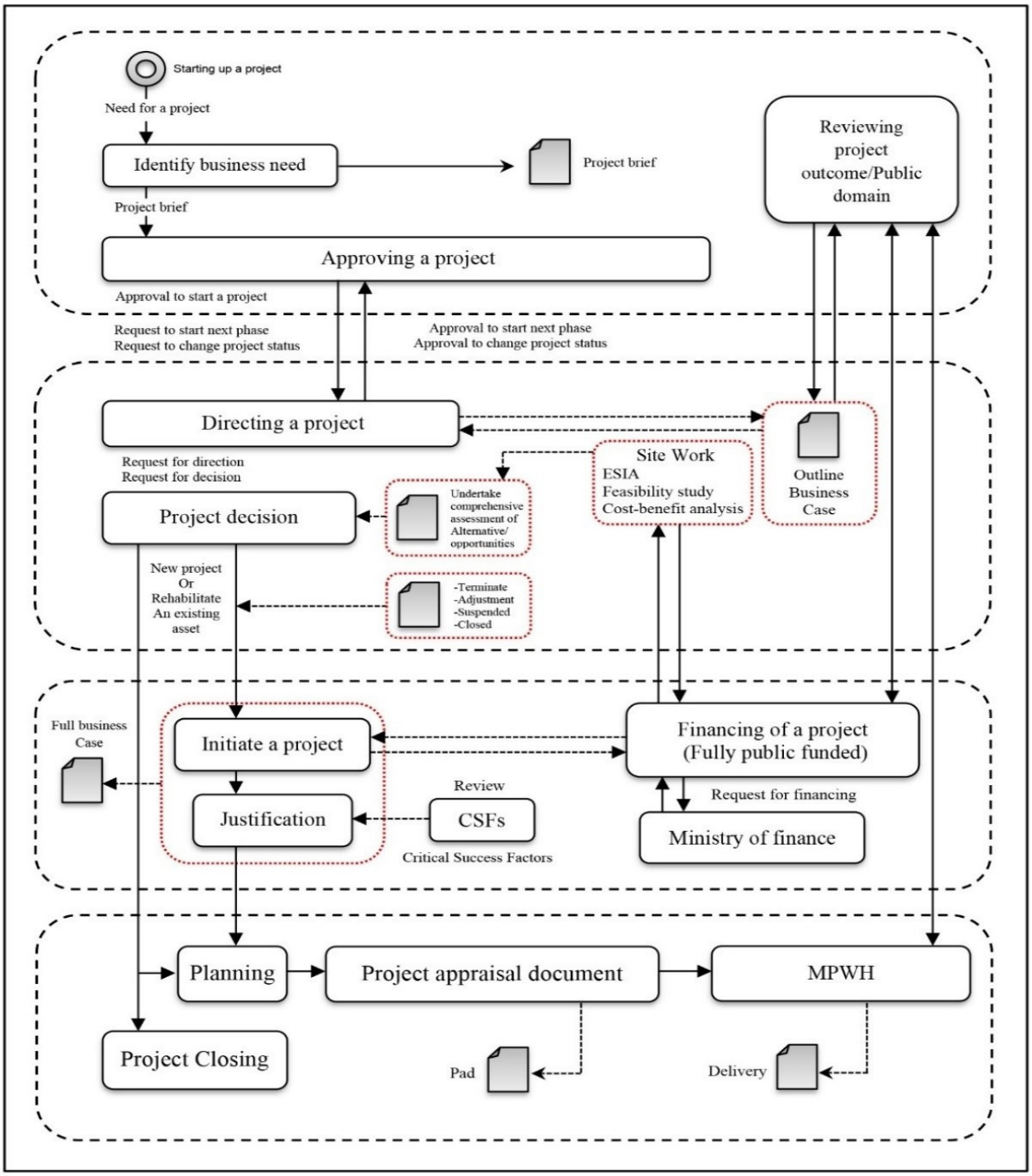

Figure 4. Proposed framework for initiating PWs investments in Jordan

5.1. Framework development and implications

The framework was developed by analyzing the collected data and then grouping them under a list of related categories. The framework consists of several elements. These elements are the steps, set of directions, and general procedures. Integrating the elements together resulted in the proposed framework, as shown in **Figure 4**. It shows the main steps and processes for initiating PWs investments in Jordan. These processes were developed based on the generic process that was found during the research study from reviewing the literature and the documentary data and conducting the

semi-structured interviews. The findings suggested elements that were not mentioned in previous works and were customized to the Jordanian context. The proposed framework has a rational link between its components and a clear structure that includes six main layers. Archival documents and a literature review were used in the first and second stages of the study, respectively, to collect data and build the structure of the theoretical framework, which was the potential output of the study. The framework was continuously reviewed to bring the main key components of the proposed framework and then build the first version of the framework. This was followed by conducting semi-structured interviews to leverage the international practices into PWs infrastructure investments in Jordan.

The results found that a PWs project starts by identifying the needs or opportunities to solve problems. In this stage, the business problem of the project is identified and clarified by developing a high-level business case and then providing an alternative solution to the problem or for the need (OGC, 2007). As a result, the need is required for investments in public projects. However, the review of existing practices in Jordan indicated that the need is usually identified using a traditional approach, referred to as the reactive approach. Therefore, this research study proposed a new technique, so-called the proactive approach, which is conducting a needs assessment. It is the process of determining how to close the gap between the present situation and the desired situation (Gupta, 2007). Shiferaw and Klakegg (2012) supported this idea and stated that the needs assessment process comprises comparing the present condition with the desired condition, defining the problem, identifying what can be contributed to the current condition, identifying if and how the current condition could be improved, and developing solutions. The findings indicated that a needs assessment can be conducted through a discussion between the central government, local authorities, municipalities, and the public. As a result, the optimal alternative for the needs can then be agreed upon transparently by different stakeholders. This can ensure that the decision becomes transparent and is based on stakeholder consensus. The delivery document in this phase is the project brief. The project brief then is requested in order to approve the ministry in charge of initiating a project and preparing the project's documents.

The government then gives the approval for initiating the project to the public domain (ministry) that is interested in the project. Once the approval has been obtained, the project is requested to be started by giving the direction for initiating the project. The project board of the ministry should review each phase and its outcomes to determine the direction of the project. This means that the direction of the project on whether to proceed or not is subject to the project's documents that the government reviews. These documents relate to project objectives, their impacts on the citizens and society, the expected outcomes, and lastly their cost. These elements are reviewed by the government to ensure the proposed project is in line with the government's views, interests, and goals. This finding is the same as what is proposed in Turley (2009), where the project board is the main contributor to defining the project's objectives and monitoring the achievements obtained at each stage of project development. This is essential to ensure the project is in the right direction for its initiation.

The findings indicated that the proposed project then is assessed by the public domain (the ministry) in charge in order to approve the initiation of the project or not. The document used is the outline of the business case. This document provides a common understanding of the project in terms of the business scope, objectives, and constraints. The findings stressed that this document

provides a solid base for a project and makes clear for all parties in the project on what the project intends to achieve, as well as its impacts on the community and its costs. Consequently, to decide whether to continue with a project or not, the initiation document is used to provide the necessary information to the project board. If the project continues, then the project initiation document (PID) becomes the baseline. This means that the PID can be used to check the expected outcomes in contrast to the original forecasts. This document focuses mainly on providing the proposed project's objectives and justifications for the initiation of the project. The next step is to request to deliver the project, but a feasibility study should be conducted first. The findings indicated that a proposed project should be evaluated by conducting a feasibility study and an environmental and social impact assessment (ESIA). A feasibility study, in some cases, can be outlined and given different names, such as the evaluation or authorization of a project. As reflected by the OGC (2007), the authorization of a project can only be obtained once the proposed project meets the required goals. In this description, the optimal solutions and the most appropriate options are selected to be evaluated and assessed to determine how to overcome the concerns and risks associated with the proposed ones.

A feasibility study is usually conducted before the project is delivered in order to decide whether to proceed with the project or not. However, the evaluation processes for environmental, social, and economic aspects take place separately once the project is delivered. This is an issue, as a project's outcomes cannot be evaluated once it is delivered, instead of the project being assessed in its objectives and expected outcomes on whether it can meet the required goals or not. Indeed, the International Transport Forum (2017) in its report stressed that most decisions that are taken for infrastructure investments are political and that no socioeconomic assessment tools may change the political decision-making. Therefore, different assessment tools can be used to improve the quality of political decisions and increase the role of planning for initiating PWs investments (International Transport Forum, 2017). The aim of conducting an ESIA and a feasibility study is to evaluate each alternative option towards achieving the benefits outlined in the business case. Also investigated are whether the estimated costs are reasonable, the solution option for the problem is achievable, the needs are fulfilled, the risks are acceptable, and, finally, whether the identified issues are avoidable. The results obtained from the feasibility study and the ESIA should indicate whether the project can proceed or whether some modifications need to be carried out on the main objectives before the project is initiated. Following this, the project board requests to identify the project site, or where the project is created. However, a project site usually is determined by the public domain. Therefore, the findings indicated that a project site should be viable and that it can create optimal solutions and achieve the needed objectives. In addition, the selected site should ensure positive impacts on the community and the development of society. As a result, the findings stressed that the selection of a feasible site should be evaluated properly by the project board to ensure the project's success in fulfilling its requirements.

In the initiation of PWs investments, a high level of a business case should be delivered, which includes the risks associated and how to manage them sufficiently. In addition, the scope of the project and the objectives should be identified and clarified. All these processes should be reviewed by the project board constantly. The expected outcomes from identifying a project's objectives should be reviewed immediately by the public domain to obtain a decision for initiating the project. In fact, this step can be conducted before allocating the funding for initiating PWs investments.

Four options for directing a project decision take place: terminate, suspended, adjust, and close. In each one, all alternatives should be reviewed in order to decide whether to proceed with the project or not. If the project proceeds, a full business case is created and then the needs for the project and alternative options should be justified based on critical success factors (CSFs). This step is very important, as CSFs are among the enablers for project success. In addition, a project board can decide which issues affecting the delivery of a project need to be overcome by considering the availability of CSFs in the delivery environment of PWs investments, such as the regulations, financing body, technical support, and governance structure of the country.

Once the project is justified and approved, financial allocation should be considered to ensure financial availability for delivering the project. The findings indicated that one of the main steps in initiating a project is to consider a financer for the project. The financing body is identified by the Ministry of Finance and/or the Ministry of Planning and International Corporation. This step is essential to ensure that the project can be delivered rather than being suspended or even closed. In some cases, the financial allocation depends on foreign sources, which are not available constantly. The findings stressed that for PWs to be initiated correctly, their funding is first allocated to ensure financial availability and then investments can be approached for the project's delivery. This is supported by the OGC (2007) and Shiferaw and Klakegg (2012), who stated that billions of dollars are spent yearly without having an impact on the community. Only the right investments should be used to fund projects. The huge amount of money that is usually spent in the wrong direction can be saved and then directed to the right investments, especially in developing economies that suffer from a lack of funding sources.

Indeed, as a developing economy classified by the World Bank as a lower-middle-income country, Jordan suffers from limited financial sources, which reflects the development of the country. In addition, its financial situation, poverty, and high public debt are considered the biggest challenges facing Jordan's economy. Despite these issues, the government of Jordan is aware of delivering public investments, whether these investments are fully funded by the government or by foreign sources. Delivering the right PWs can pay off the investments and improve the country. Moreover, the right PWs investments might ensure an improvement in the living standards of citizens and the development of communities (Consolidated Consultants, 2012).

Next, the findings indicated that the outcomes of a new project form the justification of the project if it is approved, which then proceeds to a full business case being developed to start the project plan. The project plan defines the vision, objectives, scope, and deliverables for the new project. It also describes the main structure of the responsible organization and the activities, resources, and funding required to carry out the project. In addition, planning assumptions, constraints, risks, and issues are identified. This phase starts once the outputs of the feasibility study show that the project is feasible. The planning process in this phase is started, which contains information on the time scale, the estimated costs and cash flow, the resources required, and other activities, as follows:

- Start planning for the budget of a project
- Identify the scope of management
- Identify the timing for stakeholder involvement

- Identify the timing for tendering process
- Start up the construction process
- Estimate the cash flow for the project
- Handling the project (project duration)

The findings indicated that, once the project plan is delivered, the next deliverable is the project appraisal document (PAD), which is created by the project board. This document contains the analysis of the current situation before the project is initiated and identifies the problems that justified the creation of the project. So, it is important to identify the needs and opportunities of the project. The PAD contains the following:

- Full description of the project—the objectives, the scope, and the reasons for initiating it.
- Requirements, assessment of the project's alternatives, and the justification for initiating the project.
- Project's phases and the construction phases required.
- Site work, drawings, and permits and approvals from the authorities.
- Financing (funding body).
- General and special conditions.
- Tendering approach (procurement and delivery approaches).
- Cash flow expenditure for the project.
- Feasibility study and ESIA.
- Justification for initiating the project and CSFs.

Lastly, the PAD, which contains all the aforementioned information, goes to the MPWH for it to start preparing the delivery of PWs investments under one of the following procurement options (MPWH, 2004):

- Traditional procurement
- Management procurement
- PPP procurement

In fact, the findings indicated that an appropriate procurement strategy can ensure the delivery of a project achieving its objectives. This is reflected by the OGC (2007), in that a successful project delivery depends on the right procurement strategy that the delivered project is based on. Hence, the procurement strategy is essential and should be selected carefully. However, this topic is out of the present research work's scope. Further studies can address this issue by studying the most suitable procurement strategy to deliver the right PWs investment in Jordan.

6. Conclusion

In conclusion, it can be noticed that a huge amount of money is spent every year on public investment projects in Jordan. The delivered PWs cannot meet the desired situation of the country and the requirements of the people. Moreover, the PWs investments delivered do not match the strategic direction of the government and their outcomes are not being realized. As a result, investments do not take enough time to be studied for initiating them in the right way and for developing alternative options. It is relevant to mention that the objectives of PWs investments should be set according to the needs and priorities of the citizens in Jordan. Therefore, the study proposed a framework for initiating PWs investment in Jordan.

The framework was developed to ensure that PWs development in Jordan is initiated in a way that benefits the country. In addition, the initiated PWs should meet the desired needs of the government and society . The framework seeks to ensure that the right PWs are identified once they are assessed throughout a set of procedures and that only PWs that are beneficial and meet the strategic objectives of the organization are delivered, while PWs that cannot meet the desired objectives and cannot deliver the needed benefits and outcomes are rejected. The findings indicated that the proposed framework for initiating PWs investments consists of different components and steps to be followed for initiating PWs investments projects in Jordan. The study recommends that the proposed framework should be first presented to the policymakers at the top management level to validate it before commencing a project based on it.

References

Al-Balqa Governorate (2016). *The Local Development Plan for Amman and Balqa Governorates 2016–2019*. Al-Balqa Governorate.

Alkhetan F (2017). "The government to governorate". *Alrai*.

Al-Rashdan D, Al-Kloub B, Dean A and Al-Shemmeri T (1999). "Environmental impact assessment and ranking the environmental projects in Jordan". *European Journal of Operational Research*, 118(1): 30–45. https://doi.org/10.1016/S0377-2217(97)00079-9

Bartlett D and Payne S (1997). "Grounded theory—Its basis, rationale and procedures". In: McKenzie G, Powell J and Usher R (Eds.), *Understanding Social Research: Perspectives on Methodology and Practice*, pp. 167–189. The Falmer Press.

Baum WC and Tolbert SM (1985). *Investing in Development: Lessons of the World Bank Experience*. Oxford University Press.

Bhattacharya A, Meltzer JP, Oppenheim J, et al. (2016, December 23). *Delivering on Sustainable Infrastructure for Better Development and Better Climate*. Brookings Institution.

Boddy CR (2016). "Sample size for qualitative research". *Qualitative Market Research*, 19(4): 426–432. https://doi.org/10.1108/QMR-06-2016-0053

British Standards Institute (2010). *Project Management—Principles and Guidelines for the Management of Projects*. British Standards Institute.

Consolidated Consultants (2012). *Environmental & Social Impact Assessment Study for the Expansion of As-Samra Wastewater Treatment Plant—Final ESIA Report*. Consolidated Consultants.

Creswell JW (2013). *Research Design: Qualitative, Quantitative, and Mixed Methods Approach*. SAGE Publications.

Cusworth JW and Franks TR (1993). *Managing Projects in Developing Countries*. Longman Group.

Daly HE (1990). "Toward some operational principles of sustainable development". *Ecological Economics*, 2(1):

1–6. https://doi.org/10.1016/0921-8009(90)90010-R

Denscombe M (2014). *The Good Research Guide for Small-Scale Social Research Projects*. Open University Press.

Department of Statistics (2016). *Jordan Statistical Yearbook 2016*. Department of Statistics, Government of Jordan.

_____ (2022). *Jordan Statistical Yearbook 2022*. Department of Statistics, Government of Jordan.

Dworkin SL (2012). "Sample size policy for qualitative studies using in-depth interviews". *Archives of Sexual Behavior*, 41(6): 1319–1320. https://doi.org/10.1007/s10508-012-0016-6

Easterby-Smith M, Thorpe R and Lowe A (2002). *Management Research: An Introduction* (2nd Ed.). SAGE Publications.

El-Sawalhi N and Sarhan MS (2018). "Causes of non-prioritization of infrastructure projects in the Gaza Strip". *Journal of Civil Construction and Environmental Engineering*, 3(1): 29–38. http://doi.org/10.11648/j.jccee.20180301.15

"EU: Building relations with Jordan—A look back on priorities and achievement" (2014). *Global Arab Network*.

Fellows R and Liu A (2015). *Research Methods for Construction* (4th Ed.). John Wiley & Sons.

General Budget Department (2015). *Strategic Plan 2015–2017*. General Budget Department, Government of Jordan.

Gill J and Johnson P (2002). *Research Methods for Managers* (3rd Ed.). SAGE Publications.

Government of Jordan (2015). *The National Vision of Jordan (Jordan Vision 2025)*. Government of Jordan.

Greater Amman Municipality (2017). *Public Works Roles and Strategies*. Greater Amman Municipality.

De Groot B, Leendertse W and Arts J (2022). "Co-evolution of organizations in infrastructure planning: The role of communities of practice as windows for collective learning across project-oriented organizations". *Administration & Society*, 54(7): 1328–1356. https://doi.org/10.1177/00953997221100379

Gupta K (2007). *A Practical Guide to Needs Assessment*. Pfeiffer.

Hammarberg K, Kirkman M and de Lacey S (2016). "Qualitative research methods: When to use them and how to judge them". *Human Reproduction*, 31(3): 498–501. https://doi.org/10.1093/humrep/dev334

Hancock B, Ockleford E and Windridge K (2009). *An Introduction to Qualitative Research*. NIHR Research Design Service for the East Midlands and NIHR Research Design Service for Yorkshire & the Humber.

Hart C (2018). *Doing a Literature Review: Releasing the Research Imagination* (2nd Ed.). SAGE Publications.

Infrastructure and Projects Authority (2017). *Analysis of the National Infrastructure and Construction Pipeline*. Infrastructure and Projects Authority, HM Treasury, Government of UK.

International Transport Forum (2017). *Strategic Infrastructure Planning: International Best Practice*. International Transport Forum, Organisation for Economic Co-operation and Development.

Jordan Chamber of Industry (2022). *Construction Report of Jordan*. Jordan Chamber of Industry.

Keeney S, Hasson F and McKenna HP (2001). "A critical review of the Delphi technique as a research methodology for nursing". *International Journal of Nursing Studies*, 38(2): 195–200. https://doi.org/10.1016/S0020-7489(00)00044-4

Klakegg OJ (2010). *Governance of Major Public Investment Projects: In Pursuit of Relevance and Sustainability* [PhD thesis, Norwegian University of Science and Technology].

Marcelo D, Mandri-Perrot C, House S and Schwartz JZ (2016). *An Alternative Approach to Project Selection: The Infrastructure Prioritization Framework*. World Bank.

Marshall B, Cardon P, Poddar A and Fontenot R (2013). "Does sample size matter in qualitative research? A review of qualitative interviews in is research". *Journal of Computer Information Systems*, 54(1): 11–22. https://doi.org/10.1080/08874417.2013.11645667

Ministry of Environment (2016). *National Strategy and Action Plan for Sustainable Consumption and Production in Jordan 2016–2025*. Ministry of Environment, Government of Jordan.

Ministry of Health (2005). *Project Appraisal Document (PAD) for Al-Zarqa General Hospital*. Ministry of Health, Government of Jordan.

_____ (2007). *Project Appraisal Document (PAD) for Albasheer Hospital Project, Phase III*. Ministry of Health, Government of Jordan.

Ministry of Planning and International Cooperation (2016). *The Executive Development Plan 2016–2019*. Ministry of Planning and International Cooperation, Government of Jordan.

_____ (2017). *Jordan's Way to Sustainable Development—First National Voluntary Review on the Implementation of the 2030 Agenda*. Ministry of Planning and International Cooperation, Government of Jordan.

Ministry of Public Works and Housing (MPWH) (2004). *The Regulation of Government Works No. 71 of 1986*. Ministry of Public Works and Housing, Government of Jordan.

_____ (2005). *Public Works Laws and System No. 71 for the Year 1986*. Ministry of Public Works and Housing, Government of Jordan.

_____ (2017). *Website*. Ministry of Public Works and Housing, Government of Jordan.

_____ (2022). *Plans and Its Roles, and Public Works Law*. Ministry of Public Works and Housing, Government of Jordan.

Ministry of Transportation (2015). *Strategic Plan 2015–2017*. Ministry of Transportation, Government of Jordan.

Morse JM (2000). "Determining sample size". *Qualitative Health Research*, 10(1): 3–5. https://doi.org/10.1177/104973200129118183

Naoum SG (1998). *Dissertation Research and Writing for Construction Students* (1st Ed.). Butterworth-Heinemann.

Office of Government Commerce (2007). *Sustainability: Achieving Excellence in Construction Procurement Guide*. Office of Government Commerce, HM Treasury, Government of UK.

Omodan BI and Abejide SO (2022). "Reconstructing Abraham Maslow's hierarchy of needs towards inclusive infrastructure development needs assessment". *Journal of Infrastructure, Policy and Development*, 6(2): Art. 1483. https://doi.org/10.24294/jipd.v6i2.1483

Palei T (2015). "Assessing the impact of infrastructure on economic growth and global competitiveness". *Procedia Economics and Finance*, 23: 168–175. https://doi.org/10.1016/S2212-5671(15)00322-6

Priemus H (2008). "How to improve the early stages of decision-making on mega-projects". In: Priemus H, Flyvbjerg B and van Wee B (Eds.), *Decision-Making on Mega-Projects: Cost-benefit Analysis, Planning and Innovation*, pp. 105–119. Edward Elgar Publishing. https://doi.org/10.4337/9781848440173.00013

Rădulescu MA, Leendertse W and Arts J (2020). "Conditions for co-creation in infrastructure projects: Experiences from the Overdiepse Polder Project (The Netherlands)". *Sustainability*, 12(18): Art. 7736. https://doi.org/10.3390/su12187736

Ritchie J, Lewis J and Elam G (2003). "Designing and selecting samples". In: Ritchie J and Lewis J (Eds.), *Qualitative Research Practice: A Guide for Social Science Students and Researchers*, pp. 77–108. SAGE Publications.

Serebrisky T, Watkins GG, Ramirez MC, et al. (2018). *IDBG Framework for Planning, Preparing and Financing Sustainable Infrastructure Projects: IDB Sustainable Infrastructure Platform*. Inter-American Development Bank. https://doi.org/10.18235/0001037

Shiferaw AT and Klakegg OJ (2012). "Linking policies to projects: The key to identifying the right public investment projects". *Project Management Journal*, 43(4): 14–26. https://doi.org/10.1002/pmj.21279

Sourani A and Sohail M (2013). "Enabling sustainable construction in UK public procurement". *Proceedings of the Institution of Civil Engineers—Management, Procurement and Law*, 166(6): 297–312. https://doi.org/10.1680/mpal.12.00022

Strauss A and Corbin J (1998). *Basics of Qualitative Research* (2nd Ed.). SAGE Publications.

Sweis, G, Sweis R, Abu Hammad A and Shboul A (2008). "Delays in construction projects: The case of Jordan". *International Journal of Project Management*, 26(6): 665–674. https://doi.org/10.1016/j.ijproman.2007.09.009

"The MPs calls for raising the living standards of citizens" (2016). *Alrai*.

Thomson SB (2010). "Grounded theory—Sample size". *Journal of Administration and Governance*, 5(1): 45–52.

Turley F (2009). *An Introduction to PRINCE2*. MgmtPlaza.

Wang N, Wei K and Sun H (2014). "Whole life project management approach to sustainability". *Journal of Management in Engineering*, 30(2): 246–255. https://doi.org/10.1061/(ASCE)ME.1943-5479.0000185

Williams T and Samset K (2010). "Issues in front-end decision making on projects". *Project Management Journal*, 41(2): 38–42. https://doi.org/10.1002/pmj.20160

World Bank (1994). *World Development Report 1994: Infrastructure for Development*. Oxford University Press.

_____ (2016). *Hashemite Kingdom of Jordan Promoting Poverty Reduction and Shared Prosperity: Systematic Country Diagnostic*. World Bank. https://doi.org/10.1596/23956

Yin RK (2013). *Case Study Research: Design and Methods* (3rd Ed.). SAGE Publications.

Zhang X, Wu Y, Shen L and Skitmore M (2014). "A prototype system dynamic model for assessing the sustainability of construction projects". *International Journal of Project Management*, 32(1): 66–76. https://doi.org/10.1016/j.ijproman.2013.01.009