



10. Infrastructure Sector

Summary

Infrastructure does not set a better status for life, work, or investment, but it represents the foundation on which most economic activities and actions rely. In this section, we shall divide infrastructures in the region into five categories: government directorates, the water and sanitation systems, fuel, electricity, and roads and bridges. The private sector suffers a number of obstacles in these sectors, namely lack of transparency in fiscal management of a number of governmental bodies and insufficient reporting by financial supervision institutions, not to mention the weak technical and administrative performance of the employees of these bodies. Add to these obstacles the lack of feasibility studies (financial, technical, and marketing) prior to the commencement of any project and the government's inability to provide sufficient funding for the development of infrastructure to conform to the level of other developments in the region. In the water and electricity sectors, there is a noticeable waste of resources by citizens coupled with unclear roles for private business and foreign investment. This agenda revealed some facts that indicate a broad desire among all levels within this sector to contribute actively to the sustainable management and development of infrastructures of all types. It also revealed serious efforts to privatize infrastructure, apply strategic planning, and play more significant official roles in different utilities.

Introduction

Infrastructure plays a vital role in promoting the quality of life of individuals and institutions worldwide, whether they are governmental, civic, or private in nature. Upgrading infrastructure is an essential factor in socioeconomic transformation, for effective infrastructure attracts investment and is a major factor in economic development. This, in turn, has a direct impact on corporate competitiveness and public sector services, not to mention the fulfillment of citizens' basic needs and welfare. There is little doubt that any comprehensive development process must proceed in parallel with infrastructure services that aim to improve the living conditions of citizens by providing them with physical and social services, in addition to creating incentives to establish development projects that are income-generating, investment-supporting, and productive, especially since both governments and people view economic development through a lens shaped by their own experiences and their countries' socioeconomic conditions. In many cases, development is defined according to the infrastructure that supports economic operations. (Namely economic growth rates and financial well-being, expressed by secure income and employment, especially in third world countries that suffer crises due to the lack of basic services like potable water, electricity, fuel, and communication, as well as poor state education and health services.) The developed world has witnessed changes in the concept of infrastructure over the past few decades. The concept is no longer limited to the previous definition, for it should include two complementary elements:

- Good governance. Implement less administrative centralization, strong coordination, and cooperation among different governmental circles in order to reduce costs and facilitate procedures, in addition to supporting the absence of corruption and the maximization of institutional capacities in both government and civil society institutions.

- Databases. Grant access to information, build the necessary information systems for work requirements, and adapt with changes in the surrounding environment.

It is evident that modern economic systems began to believe that good governance can be achieved through two main pillars: participation and accountability. Participation means that any stakeholder in government administration wishing to take part shall have as equal a right to do so as anybody else. It also provides for supervision and control instruments guaranteed by the rule of law. Good governance involves the equal treatment of all citizens before the law, without any discrimination, and the equal opportunities to benefit from services provided by the government.

Accountability means that those elected or appointed in the name of the people shall be held responsible by the people for their failures and shall be rewarded for their successes. To exercise accountability, information must be made available, which stresses the importance of transparency in government mechanisms and provides incentives to motivate government officials to fulfill their tasks with integrity. Incentives appear through competitiveness in the selection of employees and civil servants, as well as in implementing policies and devising clear ethics codes to encourage civil servants to serve the public interest and denounce corruption (a feature of bad governance that exhibits nepotism, favoritism and bribery). Corruption is anti-participatory because it violates the principle of equal opportunity; it is also a direct outcome of the lack of accountability.

To avoid overlapping meanings of infrastructure in terms of mega projects and requirements for societies and entities and the purpose of this research, project management decided to concentrate in this agenda on aspects related to the infrastructure implemented by the private sector in Kurdistan.

Consequently, this section covers three areas where the private sector is active in infrastructure in Kurdistan: water, energy, and roads and bridges. In addition, there is a brief presentation on institutional reform because of its importance in laying down the foundations for development and progress in this region.

Characteristics of Infrastructure in Kurdistan

Government Directorates:

The Government Directorates of Kurdistan are characterized by the following:

- Unlike the declared position of government, many economic facts show that the government's decisions on economic activity are taking the region away from a market economy and continue to apply an oriented economy.
- An inflated public sector has too many employees, while the private sector of all branches is unable to absorb much of the remaining labor force because of its weaker capacities in comparison to the public sector.
- Overlapping laws and regulations that govern economic activities and regulate citizens' living and social affairs.

Water and Sanitation Systems:

The water and sanitation systems are underdeveloped and mainly characterized by:

- Increasing demand on water that is disproportionate with population growth in the area.

- Lack of coordination among different authorities working in water management, like the Ministry of Water Resources and municipal departments.
- Increased risk of water pollution and long periods of disruption.
- Absence of any sanitation system, with the outdated existing systems being limited to storm water drainage.

Electricity

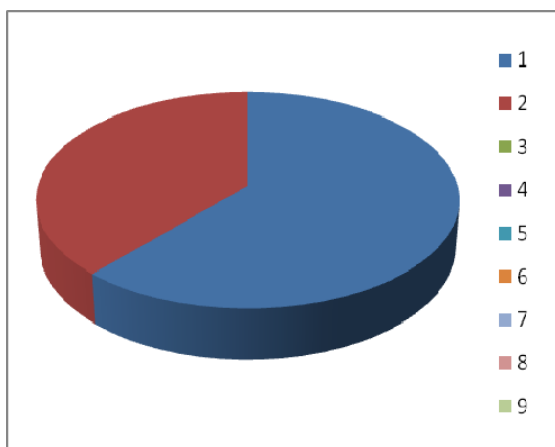
Electric power projects constitute one of the main pillars of economic development in the region, whether for consumption or production purposes. Nonetheless, this sector provides only a small portion of the region's needs and is the main cause of a number of problems and complications affecting other sectors. Its main characteristics include:

- The electricity sector in the region is unable to meet demand in comparison to other areas in Iraq. In fact, there is a huge gap between the demand on electricity and the actual output.
- The waterfalls in the region may be used as a source of electric power, but they are underutilized. There is a difference between the optimal use and the maximum power generated by Dukan and Darbindikhan stations, amounting to 649 MW.

Maximum Electric Capacity of Dukan and Darbindikhan Stations

	Station	No of Turbines	Turbine power	Total energy
1.	Dukan	5	80	400
2.	Darbindikhan	3	82	249
	Total	8	162	649

Source: Nawzad Mohammad Hamad, *Infrastructure and Sources of Financing*, Master's Thesis, School of Administration and Economy, Department of Economics, Salaheddin University, 2002, as demonstrated in the following chart:

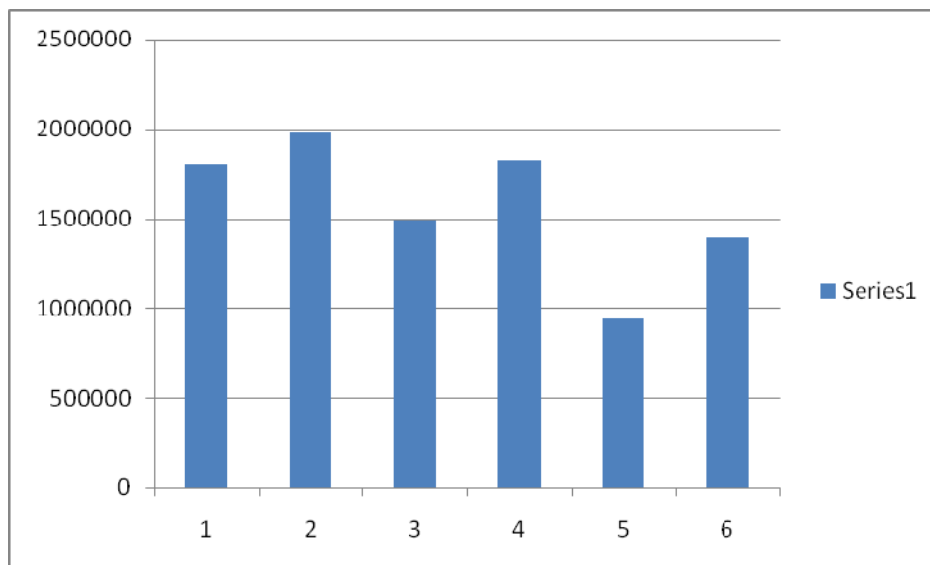


Variation in Electric Output over Years

Electricity output in the region, MW/hr

Years/details	Production	
1988	1,800,700	1
1990	1,983,000	2
1993	1,489,627	3
1996	1,823,294	4
1999	940,476	5
2000	1,393,621	6

Source: Nawzad Mohammad Hamad, *Infrastructure and Sources of Financing*, Master's Thesis, School of Administration and Economy, Department of Economics, Salaheddin University, 2002, as demonstrated in the following chart:



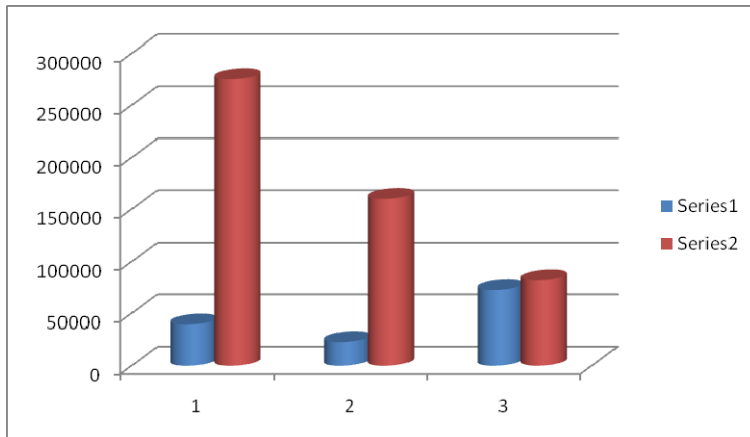
Reliance on Domestic Electric Generators in the Region's Cities to Meet Population Actual Needs

Number of Private Sector Domestic Generators and Voltage in 2000

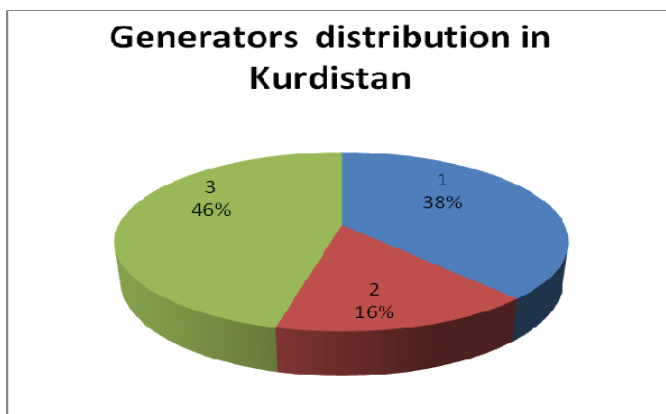
		No generators	Generated energy KVA	Generated energy Mw/h
1	Erbil	288	39,287.5	275,326.80
2	Dohouk	119	22,845	160,097.76
3	Suleimaniya	348	72,518.04	82,061.10
	Total	755	134,650.54	517,485.66

Source: Nawzad Mohammad Hamad, *Infrastructure and Sources of Financing*, Master's Thesis, School of Administration and Economy, Department of Economics, Salaheddin University, 2002.

The following diagram presents a comparison between generated energies KVA and MW/h in the three provinces:



The diagram shows a comparison in the number of generators



This shows the excessive use of fuel from the available electric power produced by the public sector because of the cheap prices—which do not actually cover real production costs

Fuel

The objective of the energy sector in the region is to provide fuel for all socioeconomic uses, in compliance with adopted standards and specifications, in addition to the diversification of sources and forms of fuel to reinforce secure provision, and develop local, traditional, and renewable sources of energy.

Although this sector was open to private investment to improve use, efficiency, and management of the available sources of energy, the move was insufficient to cause a significant boost of private investment in this sector.

The sector is facing major challenges, including:

- Direct importation and reliance on foreign power markets, with the associated high cost of the import of crude oil and oil derivatives,
- Securing the necessary funding to invest in the development of the power industry and facilities within the timeframe needed to meet energy needs,
- Finding a way to maximize efficient and more economical use of energy in all sectors, and

- Raise the specifications of oil derivatives so that they are consistent with international standards and specifications and ensure environmental protection and public safety.

The sector is characterized by the following:

- Almost total governmental control over the management of oil products;
- The government sector is unable to meet the needs of local market, even though Iraq is an oil producing country;
- In spite of the inflated size of the technical and administrative body managing this sector, it is still unable to meet local market demands;
- Absence of laws and legislation regulating the private sector's importation and exportation of oil products.

Roads and Bridges

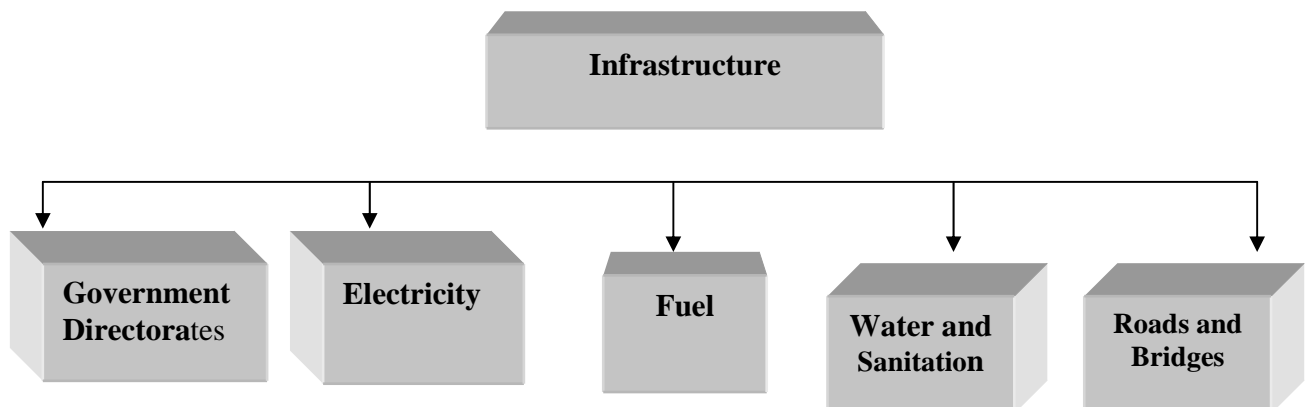
Roads and bridges in the Region are those that link the city neighborhoods to suburbs, and link cities to counties, districts, and villages. There is a significant gap between the size of the population and the needed paved roads. The roads in the region are limited to the use of cars, and there are no railways.

Methodology

Major Patterns

1. Iraqi Business Men Union-Erbil
2. Iraqi Business Men Union-Suleimaniya
3. Iraqi Business Men Union-Duhok
4. Kurdistan Contractors Union-Suleimaniya
5. Kirkuk Contractors Union
6. Kurdistan Economists Union-Suleimaniya
7. Kurdistan Economists Union-Erbil
8. Kurdistan Economists Union-Kirkuk
9. Kurdistan Economists Union-Suleimaniya
10. Kurdistan Economists Union-Duhok

Characteristics of Infrastructure in Kurdistan



Problems and Proposed Solutions

Government Directorates

Problems	Proposed Solutions
1. Inflated government sector and increasing disguised unemployment.	1. Halt inflation in government administrations; rationalize recruitment within the limits of real needs and review no-show jobs. <u>Stakeholders:</u> Council of Ministers
2. Lack of transparency in financial management of some government directorates and ignoring audit reports.	2. Apply transparency in financial management and heed governmental reports and disclosure. <u>Stakeholders:</u> Council of Ministers Ministry of Planning Audit Bureau
3. Overlapping and confusing systems, legislation, and laws governing the different administrative areas and economic sectors.	3. Conduct a thorough review of existing legislation and commence comprehensive administrative, legal, and legislative reform involving representatives of the private sector in the overall discussion. <u>Stakeholders:</u> Regional Parliament Council of Ministers Ministry of Justice
4. Sources of income and expenditures in the public sector are discrepant and are not unified under one financial administration.	4. Unify sources of income and expenditure in one budget at the Ministry of Finance, subject to control by virtue of valid laws. <u>Stakeholders:</u> Prime Ministry Ministry of Finance

<p>5. Lack of coordination among different governmental institutions responsible for the administration of the region's economy and conflicting systems and information issued by such institutions.</p>	<p>5. Impose more effective coordination mechanisms among governmental institutions responsible for the administration of the region's economy.</p> <p><u>Stakeholders:</u> Council of Ministers Ministry of Planning</p>
--	--

Challenges and Recommendations

Challenges

Many challenges are facing the regional government and private business community in reinforcing infrastructure. One of these challenges is the development and consolidation of smooth procedures and reducing frustrating, energy-wasting measures in order to move towards good governance and practices that respect the dignity, needs, and rights of the community. Important governmental decisions, including allowing the private sector to invest in oil and electricity, will be the first challenge the government must confront. In turn, the local private sector must rise to the challenge and prove its ability to undertake such responsibilities while competing with the foreign private sector, which will seize the opportunity to invest in the region. It is hoped that priority will be given to the modernization of the drinking water and sanitation systems, as well as the road network, so that they conform to the modern designs of cities in the region. The government will not be able to achieve these tremendous changes alone, and so the contribution of the private sector will factor greatly into the success of these efforts.

Aspirations

The business community in Kurdistan aspires to a comprehensive strategic plan to upgrade the infrastructure at all levels from conceptualizing modern designs for urban centers to a complete administrative reform of the government sector and a development plan of other infrastructure. The business sector is keen on working alongside the government in the development of infrastructure by contributing to all the necessary activities for the development and strengthening of this sector.

Water and Sanitation Sector

Problems	Proposed Solutions
<p>1. Increased waste of water because of:</p> <ul style="list-style-type: none"> ▪ Old distribution and supply systems, ▪ Lack of awareness among citizens towards wasting water, ▪ Low cost of water that promotes a culture of wasting water among citizens, ▪ Absence of administrative oversight committees to hold accountable those citizens who excessively use or waste water, ▪ The Water Directorates in the provinces are incapable of addressing problems of leakage in a timely manner, despite the large numbers of employees, ▪ Lack of machines and equipment for maintenance and of spare parts to maintain such machines and equipment. 	<p>1. Formulate a comprehensive strategy to address the problem of water waste, including:</p> <ul style="list-style-type: none"> ▪ Improve and develop the distribution and supply system gradually, involving the private sector in production and distribution management and organization. ▪ Impose new fees on water to recover production cost, ensure minimization of waste, and raise citizens' awareness of the importance of this resource and its reasonable consumption; involving the private sector in defining fees and periodic reviews. ▪ Appoint specialized firms to maintain networks with an obligation to accomplish tasks in a timely and accurate manner. <p><u>Stakeholders:</u> Ministry of Municipalities Ministry of Water Resources</p>
<p>2. Outdated mechanisms for water fee collections and the absence of accurate accounting at the water directorates to show the amounts of revenue expended and collected.</p>	<p>2. Proposed solutions:</p> <ul style="list-style-type: none"> ▪ Abolish the system that defines fees in accordance with the residential area and introduce a system to collect fees regularly. ▪ Appoint specialized private sector firms to collect fees, by enacting new legislation that initially allows for the participation of the private sector in water distribution and fee collection as a step towards the privatization of this sector. <p><u>Stakeholders:</u> Regional Parliament Ministry of Municipalities</p>
<p>3. Water management:</p> <ul style="list-style-type: none"> ▪ Employees of the water directorates have poor technical 	<p>3. Proposed solutions:</p> <ul style="list-style-type: none"> ▪ Involve the private sector heavily in water management, starting with

<p>and administrative abilities and do not have the capacity to conduct studies or create or implement designs according to modern technical and scientific standards. The techniques used in water management are outdated.</p> <ul style="list-style-type: none"> ▪ Water reservoirs in cities are too small to meet domestic and business needs. 	<p>conducting the necessary studies, then designing and implementing, and then training and capacity building.</p> <ul style="list-style-type: none"> ▪ Increase the technical and managerial capacities of employees through intensive training courses, especially those conducted by specialized training institutions. ▪ Review the plans—and reality—for producing, purifying and storing water intended to supply cities. <p><u>Stakeholders:</u> Ministry of Planning Ministry of Municipalities Ministry of Water Resources</p>
<p>4. Continuous depletion of underground water in spite of the abundance of shallow water due to increased digging of artesian wells to meet domestic needs, hence preventing important economic sectors and future generations from benefiting from this resource.</p>	<p>4. Set up a management and organization system to oversee underground water reserves, in addition to identifying priorities of use according to a clear strategy. It is necessary to involve the international and local specialized private sector in formulating a groundwater management strategy for the region.</p> <p><u>Stakeholders:</u> Ministry of Planning Ministry of Municipalities Ministry of Water Resources</p>
<p>5. The wastewater systems are connected to rivers and lakes because of the lack of treatment plants, which increases pollution of water that would otherwise be suitable for human and agricultural uses.</p>	<p>5. Proposed solutions:</p> <ul style="list-style-type: none"> ▪ Support private sector and foreign efforts to construct wastewater purification and treatment plants and recycle and reuse this water in agriculture and industry. ▪ Launch projects implemented by specialized local or international companies to set up integrated wastewater systems in all cities of the region. Connect them to joint or independent drainage and treatment areas in order to control wastewater and reduce its impact on public health. ▪ Allow for the establishment of

	<p>private sector and academic laboratories to monitor the quality of water, pollution levels, and quality control standards.</p> <p><u>Stakeholders:</u> Ministry of Planning Ministry of Municipalities Agriculture Ministry Water Resources Ministry Health Ministry Investment Commission</p>
--	--

Fuel

Problems	Proposed Solutions
<p>1. Outdated means of transporting oil from supply sources to reservoirs and points of consumption.</p>	<p>1. Provide the necessary facilities to the private sector in order to enable it to own specialized transportation vehicles that can transport oil and oil derivatives and take responsibility for the entire process of transportation and supply.</p> <p><u>Stakeholders:</u></p> <ul style="list-style-type: none"> ▪ Ministry of Transportation ▪ Ministry of Trade ▪ Ministry of Natural Resources
<p>3 The region relies on the quotas allocated by the Federal Government or on those imported from neighboring countries in its supply of oil derivatives, which makes the region's oil needs subject to economic and political changes and fluctuation. The situation also encourages wide-scale smuggling and counterfeiting.</p>	<p>3. Proposed solutions:</p> <ul style="list-style-type: none"> ▪ Allow the private sector to establish new refineries to accelerate the implementation of the approved oil derivative projects that meet the region's needs. ▪ Control smugglers at the source of oil to ensure that the region receives its quota. <p><u>Stakeholders:</u></p> <ul style="list-style-type: none"> ▪ Ministry of Interior ▪ Ministry of Natural Resources ▪ Investment Commission

<p>4. The public sector is unable to meet local demand, which gives way for a parallel black market for oil derivatives.</p>	<p>4. Proposed solutions:</p> <ul style="list-style-type: none"> ▪ Allow the local and foreign private sector to meet the needs of the local market. ▪ Diversify the sources of energy and alternative energy sources, and develop local sources of energy by adopting a strategy to use clean energy. ▪ Enact clear and specific legislation that guarantees all environmental, health and security elements of this trade. <p><u>Stakeholders:</u></p> <ul style="list-style-type: none"> ▪ Regional Parliament ▪ Ministry of Natural Resources ▪ Ministry of Higher Education ▪ Investment Commission
<p>5. The lack of large reservoirs to store sufficient quantities of oil to meet increasing demand.</p>	<p>5. Provide the private sector with the opportunity to build large reservoirs and allow foreign investors to work in this sector to ensure a permanent strategic reserve for emergencies.</p> <p><u>Stakeholders:</u></p> <ul style="list-style-type: none"> ▪ Ministry of Trade ▪ Ministry of Natural Resources ▪ Investment Commission

Electricity Sector

Problems	Proposed Solutions
<p>1. Electricity sector strategies:</p> <ul style="list-style-type: none"> ▪ Overlapping activities within the three functions of electricity (generation, transport, and distribution) leading to excessive centralization in decision making and ambiguous lines of responsibility in cases of negligence. ▪ Random expansion of the network and in the distribution chart to all the cities of the region. 	<p>1. Proposed solutions:</p> <ul style="list-style-type: none"> ▪ Formulate major investment strategies to develop the electric sector and identify its functions and mandates at all levels. ▪ Build an effective partnership between companies and specialized consulting firms in electric projects. ▪ Conduct technical and economic feasibility studies prior to the implementation of electric

	<p>projects.</p> <ul style="list-style-type: none"> ▪ Seek the assistance of experts and consultants upon expanding electric grids and lines. ▪ Consider seriously the separation of these activities and consider the partial privatization in accordance with legislation that allows private companies to at least participate in electricity distribution. <p><u>Stakeholders:</u></p> <ul style="list-style-type: none"> ▪ Ministry of Electricity ▪ Ministry of Planning
<p>2. Production problems:</p> <ul style="list-style-type: none"> ▪ The role of the private sector is only informal, but its contribution has been insufficient, despite the fact that its share of production exceeds that of the public sector. ▪ Continuous fluctuation of production, despite the ability of the private sector to contribute to increasing production in an accelerated manner and the government's monopoly over the official production of electricity in the region. 	<p>2. Proposed solutions:</p> <ul style="list-style-type: none"> ▪ Increase the contribution of local and foreign private sector in production, as an initial step towards the partial or total privatization of this sector. ▪ Allow official acknowledgment of the role of current local producers and issue clear regulations for this sector rather than relying on personal interpretations of the law. <p><u>Stakeholders:</u></p> <ul style="list-style-type: none"> ▪ Ministry of Electricity ▪ Ministry of Interior
<p>3. Distribution problems:</p> <ul style="list-style-type: none"> ▪ The lack of classification of electricity consumers according to purpose of consumption, or any other classification; the lack of advanced standards to control the distribution of electricity and gas. ▪ Poor electricity networks and distribution lines in the region. ▪ The low fees applied to electricity, which have an impact on reasonable use. ▪ A high level of loss because of unfair distribution of electricity among different areas and lack of public awareness regarding wasting electricity among citizens. 	<p>3. Proposed solutions:</p> <ul style="list-style-type: none"> ▪ Gradual shift in distribution towards the private sector, because of its high flexibility in oversight and the absence of red tape. ▪ Identify appropriate coordination mechanisms between electricity departments to ensure fair distribution of electric power. ▪ Introduce new electricity fees that are at least close to those in neighboring countries, which will lead to its reasonable use. Involve business associations, particularly those representing the trade, agriculture, tourism, and industry sectors, to ensure that they are not

	<p>harmed.</p> <p><u>Stakeholders:</u></p> <ul style="list-style-type: none"> ▪ Ministry of Electricity ▪ Ministry of Planning
--	---

Challenges

There is a significant gap between the energy available for consumption and the increasing demand for power. This gap is increasing because of current policies in the region for the following reasons:

- The increasing demand for electric power due to the rise in demand for imported electric devices.
- The annual rate of population growth in the region of 2.8 percent.
- The expansion of electricity grids, especially in villages and rural areas in order to encourage relocation to those areas that had previously been deprived of electric power.
- The establishment of a large number of businesses, particularly to benefit from the Investment Promotion Law (which encourages large-scale investments) without the adequate energy production to meet the demand.
- The absence of any attempt to keep abreast with scientific progress regarding modern use of alternative energy sources and clean energy, which is less costly and less harmful to humans and to the environment.

Aspirations

Experts and specialized personnel should be brought in to participate in making strategic decisions on electricity. Also, all legislative and legal barriers that hinder the contribution of the private sector to the production of electric power should be removed in order to improve performance and service. Moreover, electricity fees should be increased so that it becomes profitable for the private sector. Finally, it is possible to use the card system to control excessive use of electricity.

The use of alternative and clean energy in the production of electric power should be adopted and the role of the private local and foreign investment sector in developing opportunities for using this power should be expanded.

Roads and Bridges

Problems	Proposed Solutions
1. The government is unable to provide the necessary funding to upgrade transportation roads to match developments in the region.	1. Involve the private banking and financial sectors in providing credit to contribute to building roads and bridges. <u>Stakeholders:</u> Ministry of Municipalities Ministry of Planning Ministry of Reconstruction
2. There is a significant gap between the size of the population and available roads, especially roads that connect cities, counties, districts, and rural areas. This negatively affects the process of the reconstruction of villages and rural areas, and consequently discourages relocation to rural areas.	2. Coordinate with knowledgeable and experienced institutions to identify priorities to build and maintain roads that link cities and towns, taking into consideration the increasing needs for new roads to match the increasing number of vehicles and the population growth. <u>Stakeholders:</u> Ministry of Municipalities Ministry of Planning Ministry of Reconstruction
3. There is a huge shortage of necessary machines and equipment. Also, there is a problem with insufficient production capacities and the poor quality of the asphalt firms.	3. Proposed solutions: <ul style="list-style-type: none">▪ Make the updating of all machines in asphalt firms soliciting the active contribution of the private sector essential to making the necessary changes.▪ Impose strict quality standards on the products produced by such firms and allow for the establishment of private quality control labs. <u>Stakeholders:</u> Ministry of Municipalities Ministry of Planning Ministry of Reconstruction