

The Role of Natural Resources in Kurdistan Regional Government's Economic Development

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ABSTRACT

The oil and gas industry of the Kurdistan Region of Iraq developed rapidly between 2007 and 2013, described as the “good days” of the Kurdistan Region’s economy. However, the Kurdistan Regional Government has faced a severe economic crisis since 2014, with falling oil prices and disruption to oil production. As a newly oil-exporting region, the flow of revenues derived from oil exports plays an important role in the region’s economic development. This paper addresses three questions: What are the challenges of the resource curse facing oil-exporting countries; how has oil and gas industry development contributed to the improvement of other economic sectors, particularly the agricultural sector in the Kurdistan Region; and what policy recommendations can be made to counter the challenges of the resource curse? We argue that the Kurdistan Region’s economy is over-reliant on revenues from the oil industry and that excess revenues have not been sufficiently and effectively invested in the other crucial economic sectors, such as agriculture, to diversify sources of income.

Keywords: Agriculture Sector, Economic Diversification, Kurdistan Region of Iraq, Oil and Gas Sector, Resource Curse

1. INTRODUCTION

A negative correlation between an abundance of natural resources¹ and economic growth is described in numerous studies (Gylfason, 2000; Sachs and Warner, 2001) as a “resource curse.” Resource-abundant countries such as Nigeria, Libya, Iraq, Ghana, Bolivia, and Venezuela are among those that, for various reasons, have failed to use their wealth to develop their economies. In contrast, although the Asian countries of South Korea, Taiwan, Malaysia, Singapore, and Hong Kong possess few

natural resources other than skilled and disciplined human resources, yet they have been able to achieve economic growth and industrialize. A wide range of challenges facing oil- and gas-exporting countries has contributed to the emerging “curse,” including Dutch disease, oil price volatility, lack of economic diversification, low-quality institutions, and widespread corruption.

The oil sector of the Kurdistan Region of Iraq (hereafter Kurdistan Region) developed rapidly between 2007 and 2013 but has suffered from low-quality institutions. A poor governance model for oil wealth played a major role in ineffective management of the influx of oil revenues during the oil boom. Rent seeking, corruption, and oil revenue wastage on consumerism led to inadequate and inefficient investment in non-oil sectors, while lack of economic diversification led to the Kurdistan Region’s heavy economic reliance on oil revenues.

The contraction of the Kurdistan Region’s agricultural sector may have contributed to diverse factors in the

¹ By natural resources, we refer to oil, gas and mineral resources. In the case of the Kurdistan Region, we refer to oil and gas resources, and minerals which are not yet being exploited.

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region over recent decades. This paper focuses on the agricultural situation between 2003 and 2013 when the Kurdistan Regional Government (KRG) was formally and constitutionally established. The paper reveals evidence of the curse/blessing of oil and gas and sheds light on reasons for the decline of the agricultural sector. It also discusses which factors are attributable to oil and gas. The objective is to explain the possible relationship between oil revenue management, neglect of agriculture, and general economic planning and development. An attempt is also made to establish the extent of the role played by the natural resources sector (oil and gas) in the decline of the agricultural sector in Kurdistan Region, despite its short period of extraction.

This paper discusses three core questions: What are the challenges of the resource curse facing oil-exporting countries; how has oil and gas industry development contributed to the improvement of other economic sectors, particularly the agricultural sector in the Kurdistan Region; and what policy recommendations can be made to counter the challenges of the resource curse? Section 2 explains the resource curse and the challenges facing oil- and gas-exporting countries from different angles. Section 3 highlights recent trends in the oil and gas industry in the Kurdistan Region. Section 4 provides an insight into the evolution of the region's agricultural sector, investigating enhanced efficiency and productivity, a vision for revitalizing agriculture, and an evaluation of current capacity. Section 5 discusses the role of the oil and gas sector in the development of other economic sectors, particularly agriculture. Section 6 makes recommendations for promoting the benefits of the Kurdistan Region's oil and gas sector and how necessary resources might be allocated toward rehabilitating and developing the region's agricultural sector, to avoid the negative effects of the oil curse on agriculture and other sectors of the economy and on society in general.

2. THE RESOURCE CURSE

The “resource curse” is linked to the failure of resource-abundant countries to take advantage of the influx of resource revenues for economic development. Sachs and Warner (2001) and Ross (2003) explain that resource-rich countries tend to have lower economic growth rates than resource-poor countries. According to Ross, Indonesia managed to improve its economic growth rate, resulting in a much higher increase in per capita income than in Nigeria. In other words, some resource-abundant countries have managed to handle the challenges of economic development better than others.

2.1. Challenges of the Resource Curse

2.1.1. Dutch disease

“Dutch disease” is a phenomenon linked to the macroeconomic challenges of the resource curse and to oil price volatility in the international market, with strong implications for stability in development planning and public finance. This phenomenon occurs when oil prices rise in the world market, causing a large appreciation in the value of the national currency, which may increase imports.

Oil booms also stimulate public sector spending, resulting in higher prices for non-tradable goods and services such as housing. The workforce is attracted by increased wages in the oil industry and the non-tradable goods sector and shifts away from the manufacturing sector. Therefore, the manufacturing and agricultural sectors become uncompetitive in the face of cheaper imports. This results in a decline in productivity in tradable goods and thus deindustrialization in resource-rich countries (Corden and Neary, 1982), which is known as “Dutch disease.” Sachs and Warner (2001) also explain that a decline in the manufacturing sector may have negative long-term impacts on economic growth.

2.1.2. Volatility in oil prices

As shown in Figure 1, oil prices have been very unstable in recent years as a result of an increase in financial activities (Lombardi and Van Robays, 2011; Labban, 2010). Underlying factors such as low demand, abundant supply, and a strong US dollar caused an unexpected fall in oil prices that began in mid-2014 (Behar and Ritz, 2016; Paffes et al., 2015). However, oil prices rose to US\$60 per barrel in early 2018 as a result of oil supply limits. In addition to continuing production cuts supported by members of OPEC and Russia, disruption of supplies of Kurdish oil to the Mediterranean in the wake of the Iraqi military forces' takeover of the Kirkuk oilfields was



Figure 1. Europe Brent Spot Price FOB 1987–2017. Source: US Energy Information Administration, 2018

another major contributory factor to the oil price increase (Varghese and Samanta, 2018).

Another economic challenge faced by oil-exporting countries is volatility in international oil market prices, which has a severe impact on growth in per capita output, particularly in countries relying heavily on oil revenues. This occurs because governments increase public spending during an oil boom, but after the boom, the windfall comes to an end and the resulting budget deficit slows economic growth. However, there has been some international success in oil revenue management, such as Norway's management of volatility in oil prices through the implementation of sound fiscal measures, such as fund building and investment in international financial markets to diversify risks (Coutinho, 2011; Van der Ploeg and Poelhekke, 2008; Auty, 2001).

2.1.3. *Over-reliance on oil revenues*

Most oil-exporting countries are exposed to low economic growth in the long term due to their high reliance on oil exports and lack of economic diversification. Oil revenues are volatile and exhaustible; therefore, other economically productive sectors must be developed to promote sustainable economic growth. However, most oil-exporting countries are heavily economically reliant on oil revenues and are thus highly vulnerable to oil price volatility and disruptions to production capacity. Economic diversification is a challenge for many main oil exporters and requires an appropriate policy package, including monetary, financial, educational, and institutional policies (Stevens et al., 2015; Brunnerschweiler and Bulte, 2008).

2.1.4. *Institutional capacity*

Quality of national institutions is among other possible reasons for the success or failure of resource-rich countries to achieve economic growth is the quality of their national institutions. Countries with abundant resources and good-quality institutions are likely to achieve better economic performance than those with weak institutions (Boschini et al., 2007; Mehlum et al., 2006). Studies also show that poor institutional quality leads to declining productivity. According to Arezki and Van der Ploeg (2011), institutions may have a direct impact on per capita income through rent-seeking behavior. Several studies note that "rent-seeking" effects may occur as a result of the poor quality of institutions. Rent seeking takes place when multiple power groups have access to resource rent and attempt to increase their share of resources. This results in a decline in the efficiency and productivity of economic activities, which may lead to low levels of social welfare (Lambsdorff, 2002; Torvik, 2002).

2.1.5. *Transparency and accountability*

Lack of accurate information concerning the government's management of natural resources may result in the public believing that the government is not using natural resources wisely, is abusing power and that officials are corrupt. Many studies observe that, in resource-rich countries, transparency plays an important role in preventing "corruption," which is considered to be a different form of rent seeking. Kronenberg (2004) argues that "corruption always goes hand in hand with rents because pressure groups may block political reforms in order to protect their rents." This leads to a significant deterioration in the economy, reflected in reduced productivity growth. Kolstad and Wiig (2009) suggest that corruption may be mitigated by transparency in resource-rich countries. Transparency of information may protect social coherence and avoid escalations of social conflict.

Accountability in the petroleum sector is linked to provide information to the public to ensure that it pursues established performance targets relating to economic development for the nation's welfare. The natural resource sector involves three interest groups. The first comprises oil companies that extract the resources and benefit from oil revenues. The second is the government, which regulates the oil industry and receives and spends oil incomes on public development projects. The third group is the general public, which benefits from national resources. Lack of accountability causes social conflict as a result of ambiguity in how resource revenues are spent. This is the case in a number of resource-rich countries, including the most extractive African countries of Nigeria, Sudan, Liberia, and Sierra Leone, which suffer from corruption and mismanagement of resources. This leads to a slowdown in economic growth, increased inequalities, and poverty (Herringshaw, 2004).

Some grassroots movements, such as the Extractive Industries Transparency Initiative (EITI) and "Publish What You Pay," are attempting to compel resource-rich countries to report on their oil and gas revenues and their spending, to force governments to concentrate on welfare activities.

3. RECENT TRENDS IN THE OIL AND GAS INDUSTRY IN THE KURDISTAN REGION

The Kurdistan Region is a resource-abundant region in northern Iraq. It has proven reserves of 45 billion barrels of oil and 3–4 trillion cubic meters of gas (Oil and Gas Year, 2014). Compared with the rest of Iraq, peace and the relatively high security in

the Kurdistan Region have enabled the regional government to develop the oil sector and lease much of its land to international and local exploration companies.

Contracts signed between the KRG and foreign and local companies are based on a product-sharing contract (PSC) model (Ministry of Natural Resources, 2016). The KRG had issued 58 PSCs by the end of 2014 (Oil and Gas Year, 2014). Under the PSC model, KRG, as the owner of petroleum, engages international oil companies as contractors to provide technical and financial services for exploration and development operations. Under such contracts, international companies are often committed to accomplishing a number of projects so as to enhance capacity building in host countries. International oil companies may spend millions and in some projects even billions of dollars to develop the industry's infrastructure. Extractive industries are also labor-intensive, and if local labor is skilled, may play a major role in reducing local unemployment. In addition, international oil companies as partners may develop skilled domestic human resources in the petroleum field. This is crucial for the success of host oil-producing countries in establishing national oil companies (NOC) to gradually undertake the principal responsibility of managing all external oil- and gas-related relations with international corporations.

The Kurdistan region's petroleum law, approved by the Kurdistan Region's parliament in 2007, plays a major role in attracting outside investors. Increased direct foreign investment in the oil and gas sector is a driving factor in the rapid growth of the region's oil and gas industry (Oil and Gas Year, 2014).

3.1. Oil Production

As illustrated in Figure 2, the Kurdistan Region's oil production has grown since 2007 (Ministry of Natural Resources, 2017). Five key oil fields in the Kurdistan Region are capable of significant production: Tawke (operated by DNO), Taq Taq (operated by TTOPCO) and Khurmala, Bai Hassan, and Avana (operated by the Kar Group). Between 2003 and September 2017, oil production grew steadily and sustainably. In December 2015, the monthly average crude oil production capacity of fields operating in KRG areas was more than 500,000 barrels per day. However, on October 16, 2017, the Kurdistan region's oil production halved when the Iraqi military recaptured Kirkuk's oil fields, which had been under the control of the KRG since 2014.

3.2. Oil Exports

Construction of the Kurdish pipeline between Kirkuk and the Turkish port of Ceyhan boosted the Kurdistan Region's

oil industry, enabling it to convey its oil to the markets (Burr, 2014; Barbosa, 2014). The federal government directly controlled exports of Kurdish oil through SOMO Company between 2008 and 2012 [Figure 3].

After the government cuts the Kurdistan Region's budget, the latter signed a new oil agreement with Iraq's federal government in 2014 to offset the KRG's entitlement to a 17% share of Iraq's total budget (Coles et al., 2015). According to the new oil deal, the KRG would export 550,000 barrels of oil per day through the Kurdish oil pipeline to global oil markets. This agreement included exports of 300,000 barrels per day from Kirkuk oil fields, which were added to the producing fields in the Kurdistan region after Kurdish forces regained the city of Kirkuk from ISIS (Hawramy and Beaumont, 2014). However, this oil deal was rescinded by the federal government after the military retook Kirkuk's oil fields in October 2017.

4. THE AGRICULTURAL SECTOR IN THE KURDISTAN REGION

4.1. Evolution of the Agricultural Sector

Societies evolve, and during this process, are impacted on by developments in technology, governance, organization, knowledge, etc. Agricultural societies' evolution into industry-, service-, and pre-knowledge-based societies in the Kurdistan Region can be traced through five distinct periods: Resistance before 1987, destruction between 1988 and 1990, self-rule between 1991 and 1995, the oil-for-food program between 1996 and 2002, and a federal governance structure between 2003 and 2013.

During the resistance period, the Kurdistan region was a purely agricultural society. In terms of food supply, the region was not only self-sufficient but supplied all excess production to meet regional demand in the rest of Iraq, which had chosen an industrialization path financed by petrodollars. Thus, agriculture was the main source of income for the rural population of the Kurdistan Region, while in urban areas, the source of livelihood was employment in public services such as education, health, water, electricity, and banking, as well as governance, construction and planning, agricultural management, and private services.

During the destruction period, the central government was determined to subdue the resistance movement by destroying over 3,000 villages, farms, pasture, and sources of water. This systematic destruction of the rural economy was the

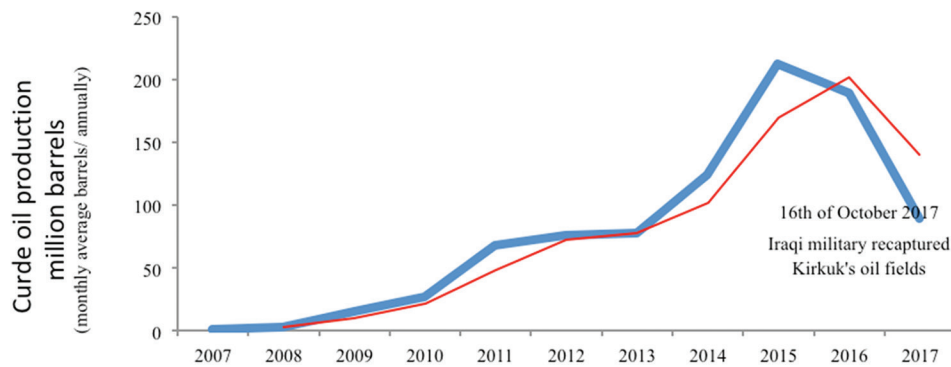


Figure 2. Kurdistan Region's oil production, 2003–2017. Source: Based on data from Ministry of Natural Resources, 2014–2017

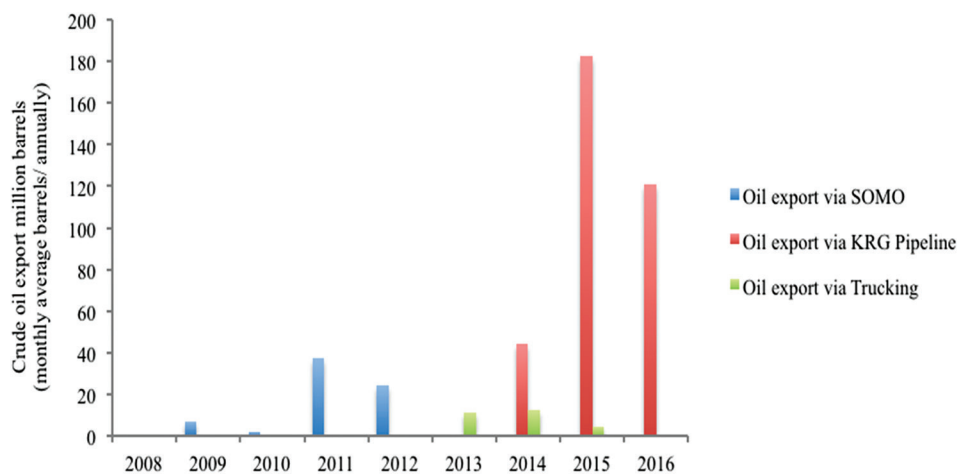


Figure 3. Kurdish oil exports via trucking, KRG pipeline, and SOMO. Source: Ministry of Natural Resources, 2015

main reason for the decline in agriculture in the Kurdistan Region. In parallel, the Anfal campaign targeted killing of the productive male population who had the potential to resist, so members of this segment of the population disappeared. There was also forced resettlement of a large proportion of the population outside the region. This process culminated in the use of chemical bombs to exterminate some settlements, which led to the establishment of a fly-free zone monitored by the US and UK air forces to protect the civilian population. The main objective was not only to protect Kurds but also to weaken the Baghdad regime's efforts to develop weapons of mass destruction.

The creation of a fly-free zone and withdrawal of Iraqi security and armed forces from the Kurdistan Region, combined with the Iraqi blockage of the region, resulted in the establishment of a self-rule semi-government in the region. However, despite the great opportunity offered by self-governance, the extent of infrastructural destruction,

limitations on access to resources imposed by hostile neighbors, inefficiency, disorganization, internal conflict, and low capability were handicaps to efforts to rehabilitate and reconstruct the rural areas, which remain an unresolved issue.

The oil-for-food program was introduced to monitor the use of oil and gas revenues for living expenses, education, health, and general development purposes. A limited share of revenues in proportion to the region's population share (estimated at 17%) was allocated to living expenses and development activities in the Kurdistan Region. The devastated rural infrastructure resulted in substitutions of local production with imported goods and with disastrous outcomes. The inability of the regional government to monitor the allocation of resources to productive activities and to regulate imported food items had a strong negative impact on the weakened agricultural sector, although it should be noted that the oil-for-food programme was a survival tool for Kurds, who lacked basic production resources. The United Nations Food and Agriculture

Organization effectively contributed to the development of the agricultural sector through supplies of farming equipment, training for farmers, and extension services. However, given the hard living conditions and shortage of basic food, some observers believe that the oil-for-food program became an extension and continuation of the destructive programme initiated by the central government.

As a result of the new Iraqi constitution initiated and rectified during the American transitional administration following the 2003 invasion of Iraq, the Kurdistan region rejoined Federal Iraq administratively. It then gained its own regional government comprising a president, prime minister, parliament, ministerial cabinet, and other public institutions. The federal governance era was characterized by a business-driven development strategy which led to the rapid development of profitable private sector business areas, while local production and national interests were neglected. Increased bureaucracy, inefficiency, consumerism, speculative investment in infrastructure unlinked with productive resources which were regionally unbalanced, and a biased urban-rural development strategy led to further deterioration of the fragile and shrinking agricultural sector. All these changes contributed to marginalization of the agricultural sector in relation to the rapidly expanding and dominant services sector. This marginalization was manifested in the agricultural sector's lower contribution to the region's economy in the form of employment opportunities and share of GDP and in food safety and security issues. Lack of a long-term perspective or emphasis on enhanced self-sufficiency and the importance of agriculture weakened the sector to a level where the Kurds' existence and their desire for self-rule were endangered.

The next sections report briefly on the current state of the agricultural sector, education, inputs and outputs in general, and their links to productivity in the Kurdistan Region's agricultural sector in particular. The aim is to shed light on the possible oil curse and also on educational limitations and how to enhance the region's agricultural productivity and develop efficient use of its water resources. Research, training, capacity building, extension services, and collaborative activities are considered among important ways to achieve national interest-driven objectives. These are expected to be financed by oil and gas revenues, suggesting that oil may serve as a blessing. The short-term, business-driven development strategy employed by the regional government, together with the absence of basic regulations, has led to a decline in agriculture and enhancement of the profitable and expanding import-driven services sector.

4.2. Enhancing Efficiency and Productivity in the Agricultural Sector

This section elaborates on issues relating to the efficiency and productivity of agricultural production and the use of water resources. The concept of productivity employed here is general, referring to relationships between inputs and outputs in agriculture. These relationships may be defined in terms of the ratio of outputs to inputs, where a higher ratio indicates a higher yield and more productive use of resources. The growth rate in productivity, such as growth in GDP, is often subjected to evaluation and comparison with the performance of other sectors and economies. On the other hand, efficiency is a relative measure, where the best practice or most productive technology is used as benchmarks. In addition to efficiency and productivity in the agricultural sector, attention is also paid to issues of efficiency in the use of water resources. Both efficiency and productivity and the growth rate can be measured at different levels of aggregation, such as at the firm, farm, sub-sector, sector, region, and country levels.

Measuring agricultural productivity and efficiency is necessary to determine the productive and efficient use of resources, such as labor, land, animal units, or quantities of seeds, fertilizers, pesticides, and water. Productivity is an index that can be measured parametrically or non-parametrically. Single-factor productivity measures the yield per hectare of land or per unit of labor and is defined as land and labor productivity, respectively. Multiple or total factor productivity (TFP) is the most common measure, which is measured as the weighted average productivity of inputs, and accounts for economies of scale. Data envelopment analysis (DEA) and Divisia and Malmquist productivity indices are non-parametric methods commonly used in studies of technical and productivity changes. Depending on the objective of the producer, such as cost minimization or output maximization, the parametric approach uses the measures based on production, cost, or profit functions. The growth rate of productivity (TFP growth) is commonly used in performance analysis and to compare the performance of production units at different levels, as in regional, sectoral, or international growth analyses.

Efficiency of production in decision-making units is very common in management. Here, managers are interested in their performance in producing goods and services. Knowledge of efficiency helps managers to allocate resources to the most efficient and productive areas. The efficiency of different units is compared with that of the unit with the best technology. Efficiency can also be measured in different ways using non-parametric and parametric

approaches. DEA based purely on inputs and outputs is the most common non-parametric method, while stochastic frontier cost and production frontiers are among the most common parametric approaches. This methodology, in addition to the input–output relationship, accounts for or allows control of managerial, production, cost, market, and policy environments and characteristics. Production and cost efficiencies are consistent with profit maximization under conditions of output maximization and cost minimization, respectively.

Like land, labor, energy, seeds, and fertilizers, water is a scarce production resource, so its efficient use and high productivity are desirable. The methods outlined previously can also be used to analyze the performance of users of water resources. Again, the aim is to maximize returns of given used water resources or to minimize the use of water to produce a given quantity of output. Water is used by households, in agriculture (including arable farming, animal husbandry, fisheries, horticulture, and forestry), and by industries and public services. These are the four main sectors of water resource use in all societies. In general, integrated management of water resources accounts for allocations of water and their externality on other users. Here, the focus is on all users, but primarily on agriculture, and public services such as recreation.

The level and growth rates of productivity and efficiency are affected to different extents by a number of factors, individually or jointly. Human capital is a key source of increased efficiency, productivity, and quality in production. There are two-way causal relationships between human capital investment and productivity: The higher the human capital, the higher the productivity, which in turn induces greater investment in research, education, and training. Under such conditions, there is strong evidence that the two factors are interdependent and mutually strengthening.

Here, capacity building refers to in-house or external capacity building programs for employees engaged in management, research, training, and extension services. In short, the training of trainees is motivated by their lack of or outdated education and skills. Regardless of the level of education, Updating skills are essential to remain close to or catching up with frontier knowledge and technology. In summary, education, training, research, and extension services are crucial for achieving national goals in the agricultural sector. Good quality and up-to-date training and extension services are a pre-requisite for making the products and services demanded by rapidly changing and competitive markets.

Research and research capacity play a significant role in providing a clear and concise picture of the actual situation and in identifying needs and measures to achieve stated agricultural development goals. Research may be carried out at different levels and in different locations. It is important to formulate strategies and establish clear decision-making in the sector, as this will improve the ability to design and implement extension services, and shed light on, and thereby strengthen their impact and feedback effects. It will also impact on the allocation of oil revenue-based resources to high-priority and productive areas. In summary, these measures will increase the performance of invested resources to enhance the blessings of oil and gas resources.

4.3. The Vision of Agricultural Revitalization

As previously mentioned, in the 1960s, '70s, and '80s, the Kurdistan Region was an agricultural society that produced traditional products. It supplied food for local consumption, and the excess was exported to the rest of Iraq and neighboring countries. The main traditional crops were wheat, barley, chickpeas, apples, peaches, grapes, and sumac (MAWR, 2012). A roadmap produced by the Ministry of Agriculture and Water Resources (MAWR, 2012) indicates that the Kurdistan Region is rich in water resources.² Five rivers (Khapoor, Great Zab, Little Zab, Awaspee, and Seerwan) run through the region, and it is also rich in springs, groundwater, and rainwater. Of the total amount of water flow, around 60% is sourced locally, while the rest is sourced from outside the Kurdistan Region. Currently, rainwater and water in general are not used effectively within the region for the development of agriculture or recreational purposes. However, there is potential and a desire to use water resources to increase the proportion of irrigated land (see Heshmati, 2009 for a comprehensive analysis of integrated water resource management in the Kurdistan Region).

The MAWR (2012) roadmap indicates that the agricultural sector's infrastructure was destroyed as a consequence of years of unrest, conflict, and the central government's policy of depopulating the region.³ Early attempts to reconstruct the sector were made locally between 1991 and 1996, mainly by farmers. However, this limited progress may have been eliminated by the UN's Oil-for-Food Program. Due to a lack of policy by the regional government, this program negatively

- 2 The importance of the agricultural sector is discussed in MOP (2011). Heshmati (2012) provides a critical review of the region's development strategy and suggests corrective and policy measures to achieve the stated development goals.
- 3 Heshmati and Khayyat (2013) discuss the government's use of mining land and water sources in the late 1980s as methods to depopulate rural areas and force the population to relocate to designated areas.

impacted on the agricultural sector, resulting in the region moving from being self-sufficient to becoming an importer of food items. Global climate change in recent years has also impacted negatively on the region's water, with increasing variations in water flows and yields.

In recent years, decision-makers have been in agreement that the sector needs to be reformed and have also emphasized the necessity for changes in management, training, research, extension activities, legislation, guidelines, and general working practices. The intended changes imply close cooperation between politicians, farmers, universities, and overall civil society. Thus, the rehabilitation and development of agricultural and water resource sectors require the specification of priorities to achieve food security, a well-formulated roadmap with clear objectives and an applicable timeframe, and effective management to ensure a sustainable food supply, taking account of the population's energy intake and dietary requirements, as well as water security and quality.

The MAWR defines its objective for these sectors as "to achieve food security, continuous improvement, and provide excellent service to the citizens," for which it "must pledge to follow up the management system to improve quality and standards." In the case of water resources, the aim is to "Secure necessary water for drinking, farming, manufacturing, and tourism; and achieve water security in the Kurdistan Region and preserve the water resources, especially the groundwater." A SWOT analysis⁴ of the internal and the external environments was used to identify the strengths, weaknesses, opportunities, and threats. The MAWR's priorities and objectives are divided into two categories: Immediate and strategic.

Immediate priorities are both internal and external. Internal priorities focus on solving management problems and organization structures; increasing the provision of services and improving standards; focusing on the public interest; improving quality control and follow-up; improving access to information on the ministry's website; establishing a program to raise awareness among farmers and consumers on how to use water in the best way and the harmful effects of using dangerous chemical inputs; assessing staff performance and activities at the ministry level; transparency; and a simplified hierarchy and reduced bureaucracy. The external priorities focus on increasing support linked to productivity, the quantity and quality of production, and the use of modern production and consumption technologies.

4 For applications of the SWOT methodology, see Markovska et al. (2009) and Terrados et al. (2007) in the contexts of the energy sector and regional energy planning respectively.

The strategic priorities are to achieve food and water security and self-sufficiency in food supply. These are expected to be achieved through preservation and promotion of agricultural products with marketing support and by the efficient accomplishment of the transfer cycle of agricultural products from farm to consumer. The roadmap provided information on actual 2011 outputs and predicted 2013 levels. Each product is further classified as the achievement of full (100%), medium (more than 50%), and low (<50%) levels of self-sufficiency in supplies of food items. This classification is carried out for crops, poultry and eggs, red meat and milk, vegetable products, fruits, fish, forests and meadows, honey, water resources, dams, and irrigation projects.

Among the legislative measures taken or in progress to upgrade the current out-of-date Iraqi laws are revision of the Agriculture Act. The out-of-date rules and regulations include: laws relating to the allocation of land within municipality borders to reduce wastage of arable land; application of scientific farming rules and formulation of a specific law for the region's farmers; the introduction of legislation to protect forest, natural meadows, livestock and wildlife; legislation to control imports of livestock and poultry; oversight of the process of livestock slaughter; separation of food security regulation from the plant and livestock sector policies; and legislation on raising livestock and poultry. The region has no legislation to protect and sustain its water resources, but a number of proposals are being prepared to cover the areas of water protection and management, dam protection and security, water bank protection, and groundwater protection and usage.

Another priority is to rebuild the destroyed agricultural and water resource infrastructure. Improving living conditions in the countryside and rebuilding villages play a key role in creating a suitable environment for farmers to return to their land. Promoting a general interest in farming, supporting producer associations, and coordinating the efforts of different ministries with interests in rural development are among the other priorities. Reforming and improving the quantity and quality of food commodities and water resources by adopting processes using special and new technologies will enhance the profitability and interest in the farming business.

To obtain sufficient energy from a decent diet, citizens should be provided with the necessary food in accordance with the stated business plan. A level of self-sufficiency can be achieved by supporting the private sector in finding markets for their products; encouraging the food industry and

improving domestic products; establishing and supporting specialist groups of farmers; protecting domestic production against imports; promoting vital and basic products; and encouraging organic and greenhouse farming. The roadmap shows the ministry's capability of reaching self-sufficiency in vital products.

To achieve these objectives, the main policies adopted along with the business plans pertain to the agricultural sector and water resources. Agricultural policies relate to protecting and improving domestic products by restricting imports that are detrimental to the achievement of self-sufficiency; providing and supporting the quality and quantity of a variety of agricultural products and developing the agricultural sector; encouraging the establishment of cooperative associations; making use of modern technologies in agriculture; increasing production in each area; marketing farming products; rebuilding infrastructure; supporting means of production; creating economic opportunities in agriculture; enhancing the capabilities of the farming workforce by providing modern training; strengthening relationships between the ministry's research centers and agricultural faculties; and facing challenges relating to forests and alterations to the nature of the land.

The policies regarding water resources are structured to achieve certain strategic objectives. This include preparing legislation for the Kurdistan Region's water resources. The legislation aims primarily to storage, management of using water resources. Other aims include: providing water for the agricultural sector and its sustainable use; encouraging local and foreign investment in the water sector; protecting water resources and implementing a system of supplementary irrigation; cleaning river water ways; raising awareness of the use of water and water recycling for irrigation; improving staff capabilities and facilitating cooperation with universities; improved readiness to meet natural disasters; focus on benefiting from surface water and preserving groundwater; providing irrigation machinery and loans for equipment purchases; establishing a council for water at the governmental level and establishing a supreme Board of Water; strengthening the role of the region in planning and decision making regarding local water resources; systematic collection of data on water resources; and working to improve standards and quality so as to benefit from the region's water resources.

These measures suggest that reforming agriculture and water resources in the Kurdistan Region is considered a major task. The success of the reforms will require a clear vision,

a specific roadmap, capable organization, and resources. The roadmap indicates that the most important issue in this context is how to conduct the work within the ministry, which is a complex challenge.

4.4. Evaluation of Current Capacity Conditions

The agricultural sector is broadly divided into crops, animal husbandry, poultry, aquaculture, horticulture, forestry, greenhouses, and the food processing industry, while water resources are divided into groundwater, surface water, rivers, and dams. The ministry's documents make little mention of the food processing industry and its operations. In terms of users, integrated management of water resources would ideally be employed to cover water usage in agriculture, industry, households, and public services. Each of these areas has its own specific functions, organization and structure, management, education, research, and training needs, as well as extension services. Some inputs and outputs are general and defined by international standards, while others are area and location specific. Where data are available, performance based on standards can be easily calculated, while other measures must be suitably defined.

Capacity building is defined as the planned development of or increases in knowledge, output, management, skills, and other capabilities of an organization through acquisition, incentives, technology, and training. In the context of the agricultural sector, capacity building involves targeting employees in the ministry and in associated offices within the region. It aims to enhance the skills of employees in understanding, planning, implementing, and assessing tasks allocated to them. The current structure of capacity building activities is organized around planning, research, training, and extension activities.

Capacity-building activities are organized by the general directorate of agricultural research and extension, which is subdivided into the directorates of planning, research and training, and extension. The directorate of planning is centrally located at the ministry in Erbil and is responsible for planning activities on an annual basis. However, the detailed nature of its activities is unknown. The directorate is expected to have a good overview of actual needs of the sector in order to determine the required capacity and its linkage to the other two directorates and their sub-directorates to implement planned development activities.

Capacity training should be allocated optimally to the different subsectors of agriculture and water resources. In the documents produced annually by MAWR, such distinctions are made by providing information about training courses

targeting specific subsectors. This will help distribute enhanced capacity to identify and eliminate bottlenecks and ensure a smooth flow between the functions and performance of different, interdependent stages.

5. OIL AND GAS SECTOR DEVELOPMENT AND CONTRIBUTIONS

5.1. General Sectoral Contributions

Despite active opposition by the federal government in the form of threats against the KRG and oil companies, improvements in the Kurdistan Region's oil and gas sector between 2003 and 2016 were impressive. This led to the development of an oil and gas industry in the region, with potential to supply needed energy for the region's consumption as well as for exports. However, there is a fear that the Kurdistan Region's economy may become heavily dependent on the energy sector and may not be sufficiently diversified.

As previously mentioned, the failure of the Kurdistan Region's oil revenue management model during the oil boom (2007–2013) hampered economic development. Therefore, the Kurdistan Region has faced a number of severe challenges in the wake of falling oil prices in 2014 and disruption in 2016 in its crude oil supplies. The KRG failed to allocate oil revenues effectively to other economic sectors such as agriculture to avoid Dutch disease. However, the absence of reliable data regarding GDP and public investment expenditure makes meaningful analysis difficult. The Kurdistan Regional Statistics Office (KRSO) has only provided data for 2011 GDP and the distribution of annual growth rates of value added by non-oil sectors in the Kurdistan Region's economy.

According to the KRSO, growth rates in different non-tradable sectors varied in the Kurdistan Region in 2011 [Figure 4]. Non-tradable sectors, including public administration and other services, formed 50% of GDP in 2011, while the GDP shares of tradable sectors were 9.4% for mining and manufacturing and 17.5% for agriculture. Banking and insurance sector incomes were negligible, at just 1.3% of GDP. Heshmati (2012) shows that the low GDP growth in agriculture arose from disproportionately increased public and private spending to pay for increased imports of goods and services.

Furthermore, reports published by the Ministry of Planning regarding total capital investment allocations in the 2013 and

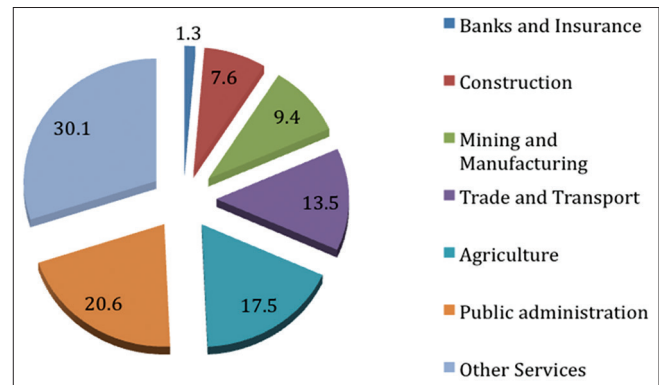


Figure 4. Distribution of annual growth rates of valued added in non-oil sectors of Kurdistan Region's economy in 2011. Source: KRSO, 2017

2015 budgets show that the highest allocations were given to the tourism, housing, and electricity sectors. The high proportion of public investment in service sectors such as housing and high levels of subsidization in the electricity and housing sectors pose challenges to government spending in productive sectors such as agriculture in the Kurdistan Region. KRG's expenditure on infrastructural investment is a critical component of GDP and may play a major role in increasing output across various sectors; however, oil revenues have exposed the Kurdistan Region's economy to the effects of Dutch disease by crowding out tradable sectors.

As explained in the Dutch disease model, the petroleum sector may be linked to expenditure or consumption effects and resource movement effects. Consumption effects refer to the direct impact of oil incomes on the economy. Oil incomes may result in increased public expenditure on imported goods and services, as well as on technology. As a result, domestic products may be unable to compete with cheaper imports, leading to a decline in manufacturing productivity. The region's Ministry of Planning indicates that the poor competitiveness of domestic goods is a major economic challenge to the small and nascent manufacturing sector in the Kurdistan Region owing to the increase in low-priced imported goods.

Resource movement effects occur as a result of high wages in the petroleum and non-tradable goods sectors, which reduce labor in the manufacturing and agricultural sectors. In the Kurdistan Region, the Ministry of Planning indicates that employment in non-tradable goods has increased. However, the oil sector may not be labor intensive. Auzer (2016) argues that a lack of skilled local labor, vocational training programs, and labor market regulations are the main reasons for limited participation of local labor in the construction, services, and oil and gas sectors. Most major public infrastructure projects

are implemented by foreign companies, which import their own workforces. Thus, the oil boom has little effect on employment and skills acquisition or on upgrading the local labor force originating from the agricultural sector.

Mismanagement of oil revenues is an underlying factor determining the economy's dependence on the oil sector. The oil sector may contribute to the economies of oil and gas exporters through effective allocation of fluctuating oil revenues. Incomes from the oil sector depend on oil prices in the world market and on extraction capacity. Therefore, volatile oil revenues pose a major threat to economic growth, as a result of macroeconomic instability stemming from inappropriate public expenditure policy through periods of boom and bust oil prices. In the Kurdistan Region, rising oil revenues induced excessive social spending on construction and infrastructure at the expense of production. In this regard, lack of appropriate investment guidelines often resulted in inaccurate evaluation and selection of public projects. This caused low efficiency and productivity in the Kurdistan Region, and thus, its economy has become increasingly vulnerable to drops in oil prices. Owing to its failure to establish an oil revenue fund, the KRG's budget is in severe deficit following the fall in oil revenues. Since the financial crisis, the Kurdistan Region has been highly indebted, and the KRG owes about \$4 billion to international oil companies working in the Kurdistan Region (Rudaw, 2017).

Oil-exporting countries may undertake appropriate measures to cope with the volatility, uncertainty, and exhaustibility of oil revenues. For instance, one way to mitigate the impact of volatile oil prices is to establish an oil revenue fund through which to save a proportion of oil revenues. However, effective management of such funds requires well-designed fiscal rules to allow governments to benefit from reduced oil volatility, build a buffer for bad times, and sustain priority expenditure. The Kurdistan Region is facing severe fiscal policy challenges due to the absence of an oil revenue fund that might be used to smooth government expenditure, adjust the budget deficit when oil prices fall, and diversify the economy through investment in other economic sectors and abroad.

The manufacturing and agricultural sectors may be the main sources of economic diversification away from the dominant oil and gas sector. These sectors, which comprise non-oil tradable goods and food, exhibit lower growth than the services sector. It should be noted that it may be difficult for the Kurdistan Region to move directly toward industrial goods for at least four major reasons: An increasing urban population, a weak or non-existent industry sector, inadequate

infrastructural development, and lack of ability to design and implement protective policies promoting local production. As an alternative, the agricultural sector has a high potential to contribute to an increase in the export of goods.

The Kurdistan Region might learn from the experiences of other resource-rich countries that have successfully developed their agricultural sectors as part of their policies of self-sufficiency in food supply and food security. For example, Indonesia spent 30% of its allocated budget on an agricultural development plan between 1969 and 1974, whereas Nigeria invested just 6% of its oil revenues on the development of its agricultural sector. As a result of the investment, real per capita agricultural output in Indonesia rose by 1.5% but reduced by 2% in Nigeria (Shepherd, 2013).

The resources sector contributes to the Kurdistan Region's economy through the direct effects and indirect investment planning for oil and gas outputs. This refers to physical outputs from the petroleum (oil and gas) sector, which feed into other parts of the economy. For instance, in general, crude oil is used as an input into refineries, petrochemicals, electricity production, and energy-intensive industries. The oil and gas sector generates manufacturing production, which leads to an increase in non-oil exports and greater self-sufficiency. However, the Kurdistan Region's oil and gas sector is not yet well-developed, and the refinery industry and other infrastructure are still being developed.

The quality of governmental institutions plays a major role in the effective allocation of oil rents in oil-exporting countries. A well-designed and functioning governance model for the oil and gas sector may help exporting countries to combat corruption, poor accountability, and lack of transparency, which are major obstacles to the effective use of oil revenues for productive purposes. The Kurdistan Region has failed to manage its oil revenues effectively because of its oil and gas sector's poor governance structure. Existing institutional frameworks suffer from conflicts of interest, corruption, non-transparent oil revenue allocation and spending, and low levels of accountability due to poor safeguarding and control. In the Kurdistan Region, the issue of transparency leads to disputes among political parties sharing power within the region and also in relation to the federal government. It thus reduces public trust in the government, leads to intergovernmental mistrust, and even extends to social conflicts.

5.2. Development of Agriculture and Water Resources

The role of the agricultural sector in the Kurdistan Region's economic development is undoubtedly fundamental and

a precondition for successful and balanced development. However, the region needs efficient agricultural production, processing, and distribution systems to achieve the needed economic development. The Ministry of Planning points out that after the oil boom in the Kurdistan Region, the rural population structure changed rapidly as a result of weakened rural policy and urbanization. On the one hand, the oil sector squeezed the agricultural sector through labor resource movement, but urbanized agricultural labor was unable to compete with imported labor in the construction sector. On the other hand, increased spending on imported goods reduced production and productivity in the agricultural sector. This indicates the prevalence of Dutch disease.

Oil revenues may contribute to the development of the agricultural sector through the development of agricultural infrastructure to achieve higher productivity. In this regard, developing the irrigation system may be vital for the agricultural sector's development. The region has invested in the construction of many dams to increase the utilization of water resources for various uses. Other factors include developing infrastructure, including roads, and supplying machinery and inputs such as seeds, fertilizers, pesticides, and extension services, as well as supportive product supply-and-demand management policies. Equally significant is the integration of agricultural product markets in the Kurdistan Region with regional and international markets to make the sector competitive in the long run.

The agricultural sector should be supported by allocations of oil revenues to enable it to pursue the objectives of generating employment in the agricultural sector, which will lead to a decline in overall unemployment rates; diversifying the economy to reduce vulnerability to fluctuations in exports and foreign exchange, which will result in an increase in GDP growth and more balanced trade relations; and providing raw materials for industry, which will generate productivity in other sectors. Another key aspect is to develop the rural economy to reduce the flow of population to urban areas and urbanization and reduce investment in infrastructure and service development in urban areas.

5.3. Development of Other Sectors

Oil revenues may contribute to the development of other sectors such as infrastructure, housing, water supply, electricity generation, health, education, media, communications, tourism, and various labor training programs. Resource allocations to the service sector are relatively high, but the quality and productivity of the sector are low. In this case, various factors play a role in the underperformance of

the sector, including rent seeking, corruption, and weak institutions.

The education sector has benefited greatly from the oil boom. Before 2003, the region had four major public universities: Salahadeen, Sulimany, Dohuk, and Kirkuk. In 2013, it had 19 public and private, small and large, national and foreign universities with undergraduate, graduate, and specialized educational programs covering all sciences. Teaching and research quality are low, but these are gradually improving to keep up with the region's development needs. In an effort to enhance the capacity of the labor force and improve the quality of the education system, the regional government is allocating large grants to send public servants and students to well-known universities around the world to upgrade their education and skills. The process is slow, but positive effects can be seen in the services sector. Major progress has also been made in the health sector, but the quality and accessibility of public health services are limited, especially in rural areas and for low-income families, compared with the private sector, which targets middle- and high-income families.

Adequate public and private investment in tourism may make this sector more productive and economically successful. Tourism is expected to play a major role in the region's economic growth and service sector development. The massive inflow of petrodollars and lack of investment opportunities in mining and industry have led to investment in hotels, restaurants, and the information and communication industries, which form a strong base for the tourism industry. The Kurdistan Region is safe and has beautiful natural surroundings, and its people are hospitable. The large inflow of tourism, mainly from the rest of Iraq, is evidence of the positive impacts of infrastructural development that attracts more interregional and direct international investment to the region.

6. POLICY RECOMMENDATIONS

This section provides policy recommendations based on the discussion and analysis presented in this paper. The objective is to impact positively on policy relating to enhancing economic growth in the Kurdistan Region, to increase its ability and flexibility to mitigate the negative impacts of the resource curse and promote the blessing effects.

In relation to the two main effects of spending and resources, a policy to stabilize the exchange rate is beyond the ability

of the KRG. The regional government is responsible only for the regional economy and is therefore unable to impact on the monetary and fiscal policies of the federal government. The regional government's flexibility has increased, as it has started to use dual currencies, the dinar, and the dollar, in domestic and international transactions. This has reduced the rate of exchange for foreign investors and the exchange risks of investment in the Kurdistan Region. The dollarization of the Kurdistan Region's economy has been maintained, which is positive for the region's international financial relations.

Among other recommended policy measures, it is important to prepare an economic plan for the region, a significant element of which should be oil revenue management. A key requirement is to build an oil and gas managerial model to promote the blessing effects while preventing the curse effects of oil and gas revenues. To reduce the region's high dependence on oil and gas revenues, diversification of the economy with an emphasis on development and production of the industrial, services, and agricultural sectors is recommended, as well as the introduction of effective taxation to smooth the flow of public resources. The experiences of other resource-rich countries in creating well-designed stabilization funds for oil and gas revenues might be used in determining fiscal policies.

The Kurdistan Region needs an effective governance model for the oil and gas industry based on separation of policy-making, regulatory, and commercial functions to avoid conflicts of interest and increase transparency and accountability. Furthermore, effective oversight by independent local and international bodies is vital for the effective management of oil revenues. The Kurdistan Region's parliament and local and international auditors must play an effective role in making oil and gas activities transparent and accountable. Establishment of a NOC might be used as a tool to achieve wider socioeconomic policy objectives, such as economic diversification and raised local educational levels.

A well-designed oil fund might increase transparency in revenue allocation and spending. It might also build trust between government and public, thus encouraging political and social cohesion in the Kurdistan Region. An effective oil fund might also smooth expenditure such as subsidies in the public sector and increase public investment in other economic sectors such as agriculture, tourism, infrastructure, and education. The oil and gas sector and other natural resources should be in the public domain and under national ownership. They should not be part of the current business-

driven development strategy initiated and governed with little accountability by a politics–governance–business alliance.

The weak financial sector is another challenge that should be addressed by the KRG by strengthening the banking system to promote savings and thus increase investment in the private sector. Furthermore, the weak and almost non-existent taxation system in the Kurdistan Region needs effective and long-term reform to make it progressive and diversified, with good coverage to generate public revenues.

To address the crowding-out effects relating to Dutch disease, it is vital to build an effective fiscal fund to help promote small- and medium-sized enterprises in the Kurdistan Region and thereby support economic growth and development. Since SMEs in the service sector are labor intensive, they may play a major role in increasing employment, developing skills, and alleviating poverty. Therefore, it is important to develop regulations relating to the private sector, such as retirement and insurance provisions.

The low quality of higher education and vocational training institutions hinders the effective involvement of local graduates in the oil and gas sector and thus localization of the oil and gas industry in the long term. Therefore, an increase in public capital investment allocations for human resource development is essential to develop the skills required by labor markets in the private sector, and particularly, in the oil and gas sector. Private universities and hospitals were initially established as objects for investment, with little consideration of service quality. Quality and its improvement need to be regulated and brought in line with the needs of society.

Diversification of trading routes is vital for the Kurdistan Region's economy as it is landlocked. The Kurdistan Region's major source of income is oil revenues, but the only way for Kurdish oil to be exported to global oil markets is through Turkey's Ceyhan port. This makes the KRG's economy heavily dependent on political and economic relations with Turkey. A second export route for crude oil might be established through Iran to Asia. Engagement in trade and investment in transport infrastructure are strongly influenced by Turkey and Iran, which take advantage of the Kurdistan Region's landlocked condition to engage in political interventions in the region's autonomy.

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