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The Impact of Agricultural Production on the Economic Growth and the Reduction of Poverty in Civil and Rural Regions of Iraq

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Key words:	Abstract:
    Corresponding author: **Zeina Abdel Qader Zeno** **University of Mosul**	Many agricultural studies have been performed regarding the impact of agricultural production on economic growth and poverty reduction. However, according to the literature, there still exists a problem in providing comprehensive studies that consider the Iraqi case, especially under the current economic situation in the rural and civil regions. Therefore, this paper presents a comprehensive study that analyses the impact of the agricultural production level on the whole country's economy as well as on reducing the poverty in Iraq. The dataset used in this work was collected from one of the most accredited statistics resources in Iraq, which is the Central Organization for Statistics and Information Technology (COSIT). The dataset used was a time-series-based of poverty in 10 random regions in Iraq from the years 2010 to 2019. The results showed that the poverty level is significantly affected by the agricultural sector productions in rural and civil areas in Iraq.

دور الإنتاج الزراعي في الحد من الفقر في المناطق الحضرية والريفية في العراق

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المستخلص

يهدف البحث إلى دراسة دور الانتاج الزراعي في الحد من ظاهرة الفقر في المناطق الريفية والحضرية في العراق على اعتبار ان الانتاج الزراعي يسهم بتأثيرات ايجابية في النمو الاقتصادي وخفض معدلات الفقر في اي دولة، ومن هذا الشأن اعتمد البحث على فرضية مفادها ان الانتاج الزراعي يلعب دورًا بارزًا في الحد من ظاهرة الفقر في المناطق الحضرية والريفية في الدولة قيد الدرس، ومن اجل اثبات فرضية البحث تم جمع بيانات عن الفقر الكلي والفقر الريفي والفقر المدني فضلاً عن متغيرات اخرى شملت كل من نمو العمالة الزراعية والعمالة في القطاعات الاخرى وفي عشرة مناطق عشوائية في العراق خلال المدة 2010- 2019، وقد تم اعتماد البرنامج الاحصائي SPSS من اجل الحصول على افضل النتائج اللازمة في توضيح اثر المتغيرات المستقلة في المتغير المعتمد، لقد تم التوصل الى مجموعة من الاستنتاجات كان اهمها ان مستوى الفقر في العراق يتأثر بشكل كبير في انتاج القطاع الزراعي في المناطق قيد الدرس، فضلاً عن تأثر الاقتصاد بالقطاع الزراعي بشكل كبير، أما عن اهم المقترحات فقد تمثلت في تحسين وتطوير البنى التحتية في ارياف العراق وإرشاد الفلاحين نحو اعتماد اساليب الزراعة الحديثة بهدف رفع معدل نمو الناتج الزراعي وتسهيل تسويق المنتجات الزراعية وبما يمكّن الفلاحين من الحصول على عوائد كافية تسهم في رفع مستوياتهم المعاشية والثقافية والحد من ظاهرة الفقر.

الكلمات المفتاحية: النمو الاقتصادي، الحد من الفقر، المناطق المدنية والريفية.

1. Introduction

Since the beginning of the current century, the world has witnessed various life challenges. Poverty is considered one of the most common challenges facing the governments of most developing countries [1]. Therefore, these countries are seeking solutions to reduce their poverty levels, and important steps have been taken in this regard to overcome this dilemma [2]. Unfortunately, the COVID-19 pandemic has made the situation more difficult, as most commercial activities around the world have come to a halt [3]. This situation has led to a significant increase in poverty levels worldwide [4].

Iraq, as a developing country, has also been affected by the COVID-19 crisis, which in turn has affected the country's economy as a whole [5]. Climate change is another factor affecting the Iraqi economy, especially the agricultural sector [6]. Moreover, the impact of poverty has not been limited to urban areas only, but has also included residents of rural areas [7]. The literature includes numerous studies demonstrating the impact of the agricultural sector on the economic growth of the country as a whole. Studies [8-12] have shown that the agricultural sector is an important factor that can play a significant role in the development of any country's

economy. Furthermore, many experts [13] confirm that the growth of the agricultural sector can contribute to reducing poverty levels. Other studies, such as [14-17], have shown that poverty affects rural areas more than urban areas.

Most studies address cases other than Iraq. Therefore, the literature lacks studies that consider Iraq, as a third-largest developed country, as a case study of the impact of the agricultural sector on the country's growth as a whole and poverty levels in urban and rural areas. This study thus fills this gap and provides a case study that takes into account the impact of the agricultural sector on the country's economy and also illustrates its impact on urban and rural areas. To achieve this goal, we collected data on the growth of the agricultural sector and other sectors in terms of labor force numbers. We also collected data on poverty levels in ten informal settlements in Iraq, including both urban and rural areas. The data considered in this work spanned the years from 2010 to 2019.

This research paper is organized as follows: The next section describes the methodology used in this research. The third section presents the empirical results obtained using the proposed approach, along with a discussion of the findings. The fourth section concludes the work.

2. Research Methodology

In this work, we plan to use a time-series dataset collected from the Central Organization for Statistics and Information Technology (COSIT) [18]. The dataset used was a time-series-based of poverty in 10 random regions in Iraq for the years 2010 to 2019. For the purpose of estimating the impact of agriculture on reducing the poverty level, we build three regression models as follows:

- Total Poverty Level Model:

$$[\![Poverty]\!]\_T = \propto\_0 + \beta\_T + e \quad (1)$$

- Rural Poverty Level Model:

$$[\![Poverty]\!]\_R = \propto\_0 + \beta\_R + e \quad (2)$$

- Civil Poverty Level Model:

$$[\![Poverty]\!]\_C = \propto\_0 + \beta\_C + e \quad (3)$$

Where the dependent variable Poverty T refers to the total poverty level in the selected areas in Iraq, Poverty R refers to the poverty level in rural areas, and Poverty C refers to the poverty level in the civil areas. The independent parameters of the three models are $\beta\_T, \beta\_R,$ and β_C respectively. The error in the three models is denoted by e. The implementation of the three models was performed in SPSS. We also used F-test and t-test in the analysis.

Using the abovementioned models, we used the Analysis of Variance (ANOVA) and the following hypotheses testing to see whether the

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difference in poverty levels between civil and rural is statistically significant:

Null Hypothesis: it assumes that the mean values of the poverty levels of the selected years are not equal.

$$H0: \mu Civil \neq \mu Rural \quad (4)$$

Alternative Hypothesis: it assumes that the mean values of the poverty levels of the selected years are equal.

$$H1: \mu Civil = \mu Rural \quad (5)$$

The significance level we used in this test is 97% (α=0.03).

The other regression model is built to test how significant the impact of the growing agriculture sector is compared to the other sectors on the total economic growth of the country. The model is formulated as follows:

$$[Growth]\_Total = [Growth]\_Agriculture + [Growth]\_other \quad (6)$$

Where GrowthTotal, GrowthAgriculture ¬, GrowthOthers denotes the total growth and the growth in the agriculture and the other sectors respectively. Additionally, we assumed two hypotheses as follows:

Null Hypothesis: the growth of the agriculture sector is significant in the total growth of the country.

Alternative Hypothesis: the growth of the agriculture sector is not significant to the total growth of the country.

3. Results and Discussions

This section presents a descriptive statistic based on the data collected. The table also shows how the poverty levels are varied from civil and rural areas. It can also be seen that the levels from 2010 to 2019 show some trends in the data.

For the purpose of showing more details about the data, Figure 1 describes in detail the poverty levels in the civil and rural areas as well as the error in data (variations). The orange bars reflect the civil regions and the blue bars reflect the rural regions. The percentages are shown for each year (2010-2019). The figure also shows the error bar for each year for both civil and rural regions. According to the figure, it is clear that there is a significant increase in the poverty level in the period 2013-2015, which is due to the unstable situation in Iraq in those years.

Table 1. Percentages of the poverty levels in civil and rural regions in Iraq for the period.

Year	Poverty_Civil	Poverty_Rural	Total Poverty
2010	86.0	150.71	236.71
2011	90.81	148.0	238.81
2012	95.23	147.65	242.88
2013	92.16	151.43	242.59
2014	98.54	142.22	240.76

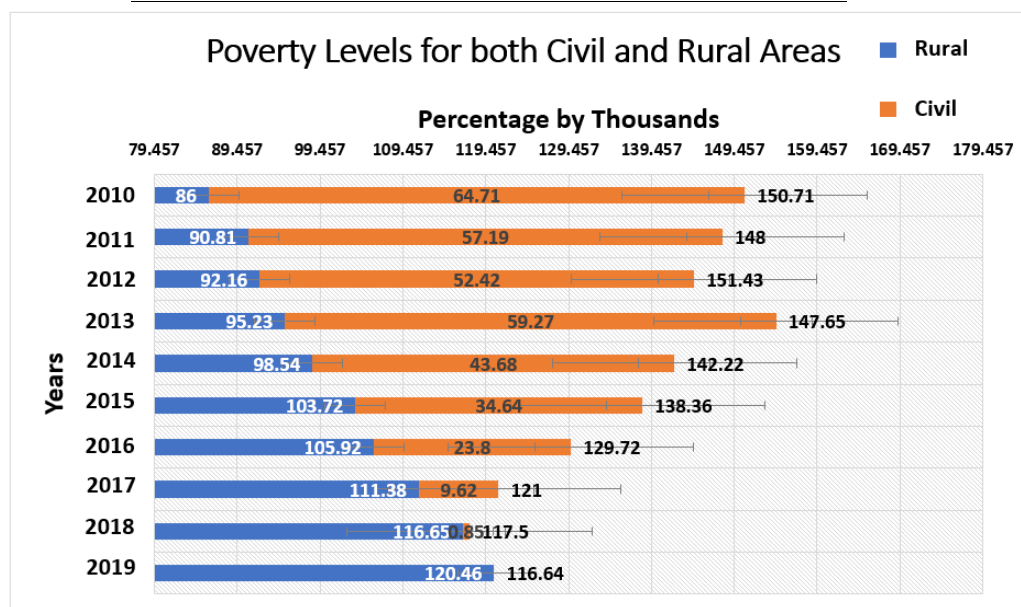| 2015 | 103.72 | 138.36 | 242.08 |
2016	105.92	129.72	235.64
2017	111.38	121.00	232.38
2018	116.65	117.50	234.15
2019	120.46	116.64	237.1

Figure 1. The poverty levels in civil and rural areas. The error is also shown for each year.

Based on the hypotheses considered, we found that the p-value of the ANOVA test is (0.00000158), which is significantly smaller than the significance level (97%). This means the difference between the poverty levels of civil rural regions in Iraq is statistically significant. This also means that the rural areas are mainly dependent on agricultural production. As a result, Iraq has witnessed a move from the rural to the civil regions, which causes the population of the cities to increase every year that is, in turn, reduces the job opportunities. It should be mentioned that the agricultural sector in Iraq is almost the lowest compared to the other sectors. One of the reasons behind this phenomenon is climate change and its impact on the whole country.

Now, the growth caused by the agriculture sector compared to the growth caused by the other sectors is investigated. Table 2 shows the growth in the agriculture sector versus the growth in the other sectors in terms of labor for the years 2010-2019. As can be seen in the table, the difference is significant. However, our analysis approach is to test whether the difference is significant. Therefore, we used the regression model mentioned in

Equation 6. The confidence level we used is (97%) (α=0.03). The obtained p-value of (0.10034) approved that we have to accept the null hypothesis. This means the growth of the agriculture sector labor has a significant impact on the total growth rate of the country. These results can also be interpreted using Figure 2. It shows that the growth of the agriculture sector (grey color) is comparable to the growth of the other sectors (red color). The figure also depicted the variations of the other sectors' growth that are also comparable to the variations of the agriculture sector.

Finally, we can say that the agriculture sector has an impact on the total economy of the country. Moreover, the most affected population is the people who live in the rural areas.

Table 2. The labor growth in the agriculture sector and the other sectors in Iraq for the period from 2010 to 2019

Year	Agriculture Labor Growth	Other Sectors Labor Growth
2010	354.82	1820.45
2011	368.47	1823.75
2012	371.9	1827.02
2013	370.76	1826.15
2014	320.31	1824.8
2015	317.5	1820.77
2016	319.07	1817.64
2017	318.66	1818.2
2018	316.3	1818.89
2019	322.98	1820.06

Source: Republic of Iraq, Ministry of Planning and Development Cooperation, Central Organization for Statistics and Information Technology, Annual Statistical Abstract for the years 2010-2019
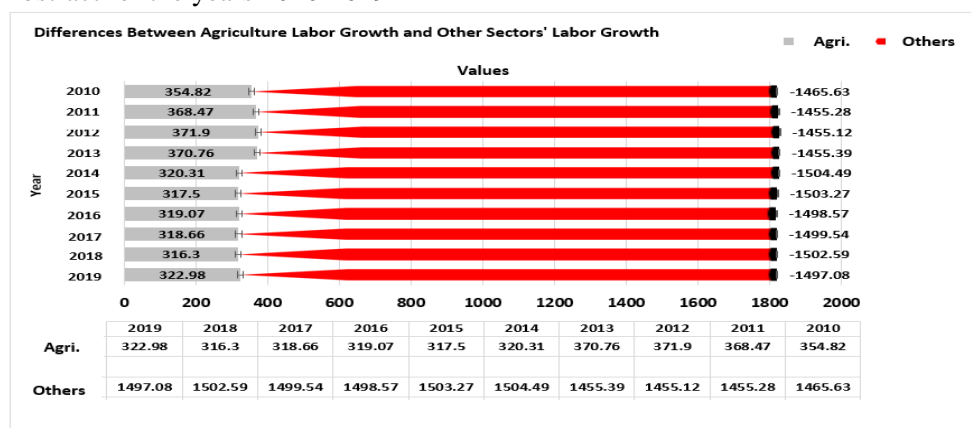

Figure 2. Differences between agriculture labor growth and other sectors' labor growth in Iraq for the period 2010-2019.

Source: Republic of Iraq, Ministry of Planning and Development Cooperation, Central Organization for Statistics and Information Technology, Annual Statistical Abstract for the years 2010-2019.

Conclusions

1. Poverty levels in Iraq are significantly affected by agricultural production in rural and urban areas. Agricultural workers and rural individuals are typically the most affected by this phenomenon.

2. The agricultural sector in Iraq is significantly affected by climate change, which has a significant impact on agricultural output, which in turn has a significant impact on poverty rates.

Proposals

1. Improving the infrastructure in rural Iraq with the aim of developing agricultural production and reducing poverty and rural-urban migration.

2. Guiding and training farmers to adopt modern agricultural methods by having extension agencies organize development and awareness courses for farmers to guide them on modern agricultural methods, given their crucial role in increasing agricultural production, raising farmers' living standards, and reducing poverty.

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