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THE IMPACT OF GEOGRAPHICAL ASPECTS FOR AGRICULTURAL DEVELOPMENT IN UZBEKISTAN

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ABSTRACT

The last years of the current century witnessed an agricultural revolution in many developing and developed countries. This was achieved through the overlap of two main factors, the economic and geographical factors that control our daily lives and are considered among the most important factors that contributed major roles in the development of the agricultural sector. The economic aspect represents its role in how providing the necessary resources to increase agricultural output from various types of high-productivity inputs. As for the geographical factor, its role was represented in providing what the aforementioned sector needs in terms of land, water, heat and humidity for girls, given that these factors contribute together to achieving continuity in human life. Therefore, our study came to clarify how to use the factors Economic and geographical in achieving large-scale agricultural production sufficient to meet the need for self-sufficiency with the survival of a surplus for export, with an explanation of the mechanism performed or carried out by each sector with the intention of presenting it to researchers working in the field of agricultural research, especially in rural areas where the latest agricultural technologies are transferred to it with the aim of Adoption by farmers, and in order to achieve this goal, a number of economic factors have been used A number of researchers have prepared studies for this purpose.

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INTRODUCTION

The agriculture sector is considered one of crucial parts in our life. It satisfies and support the living exteriors of the population as well as it contributes to the profitability of having many sources of income (De Silva and Dayawansa, 2021 and Ratna et al., 2021). In many countries, the agriculture sector is given high priority when it comes to development. This is because countries try to secure the required amount of food as much as possible and reduce the lack, which eventually reduce the amount of importing food items from abroad (Ratna et al., 2021 and Mukhopadhyay et al., 2021). Moreover, the development of the agriculture sector led to increase the amount of exporting food items and increase the income of the country. This can be obtained by optimizing the crop areas and increase the share of types of fodder crops (Mukhopadhyay et al., 2021). Other ways such as supporting the development of farmer documentation, optimal utilization of "dexkon farm facilities", development of sophisticated systems and techniques for the purpose of transporting, storage.

processing, and the sales of the products (De Silva and Dayawansa, 2021 and Laurett et al., 2021).

Other development factors and techniques are based on using "agrochemistry" aiming to enhance the corps areas as well as the use of well-engineered irrigation systems. Furthermore, introducing sophisticated water resource that are based on "agrotechnologies". These techniques have the ability to overcome or at least mitigate the influence of global climate change (Musurmanova and Ismailova, 2020).

According to our observations considering many worldwide countries, the collective experience of the developed countries can be of high benefit to the other countries since it has been played a crucial role in the agriculture sector in a general speaking (Mansfield, 2021 and Sasaki et al., 2021). For instance, the "Japanese Kishlok Cell" case proved that Kiska witnessed a great success (Kurbanov, 2021). This interesting and successful case happened after the economic crisis of Japanese. The Japanese officials spent great efforts in establishing an independent flame by benefiting many technical approaches as well as experiences of scientific researchers in the agriculture field (Kurbanov, 2021).

Systems for managing the agriculture sector. In addition, they created a local viable system for living organisms, follow efficient approaches to use organisms, improve the abilities to develop the kinetic of the organisms, build effective protection environments, and the development of what they called "Maksida Kishlok farm". Besides, in japan they initiated two scientific research institutes under the support of departments of Fisheries and Forestry, namely, "Institute for the study of Bioresources within the framework of the rural economy" and "Institute for environmental problems of the rural economy". These institutions provided with funds to support theories, studies, innovations and apply them in reality. The outcomes of these institutions were significantly support many agricultural technologies such as corps genetics, improve the products. innovate new storage technologies, determining the optimal conditions for protecting products. reproducing corps without seeds, protecting plants from variety of diseases, to mention a few (Zimdahl, 2018).

According to the literature. Figure 1 demonstrates the research methods followed by the worldwide researchers. This research the focuses on variety of regions considering geographical and economic aspects.

The structure of this article is divided as follows: the next section will give a brief description about the research methods and the items, variables, and methods used in agriculture research.

Section 3 provides the obtained results and discuss them. Finally, this work is concluded in Section.

MATERIALS AND METHODS

The research method followed in this work is based on the following items:

- Experts, who are professional in the field
- Statistical and Mathematical approaches.
- Extrapolation.
- Questionnaires that can be distributed to expert individuals.
- Sociological studies that can be inspired.
- SWOT Analysis.

- Energy production and resource cycles. Economic zoning.
- Others methods that can be useful in economic and social-geography.
- Importance of the methods in geography.

The following two formulas represent the natural geographic studies (Equation 1) and the social geographic studies (Equation 2) (Zimdahl, 2018; Engineers, 2019):

$$I_t = (l_a + D_a) \times T_y \quad (1)$$

$$I_t = (l_a + S_m) \times T_y \quad (2)$$

Where I is scientific research, I represents scientific literature. The field practice is represented by the term D., and the statistical data is represented by S. and the term T, is the methods.

According to the aforementioned equations, the uniqueness degree of studies along with their practical importance is highly effective and play a key role in defining the appropriate "Socio-Economic development strategy of small and large regions. The focus here is on the techniques used in investigating small regions (Simelton *et al*., 2009).

The dataset used in this work was collected from official websites of the Republic of Uzbekistan. The dataset includes 12 different regions (Region I to Region 12) and their public information (e.g., irrigation lands and their population distribution).

RESULTS & DISCUSSION:

We started with methods including mapping, questionnaires, SWOT analysis, mathematical and statistical methods, and problem modeling (Kamilaris *et al*., 2017; Niknejad *et al*., 2021; Dorr *et al*., 2021; Benzaghta *et al*., 2021). In this work, it is crucial to use regional analysis and network structure. Also, the method is based on using different sectoral systems and regional systems. The method used is also based on a system-based approach in economic and social geography. In this context, two approaches are involved in the development strategy of "Socio-Economic" as well as in the development of regional economy and regions in economic geography. The approaches are as follows (Ara *et al*., 2021):

- The first approach is considered as "Top Down" system structure Province-Level areas to Rural-Level areas.
- In the second approach is considered as a systematic "Bottom Up"

We propose to build a coordination between these two approaches at each analysis step aiming to ensure the reality, feasibility, and efficiency of different developments.

Practically, the "Top-Down approach leads the "Socio-Economic" development strategy of a country to have internal implementation. On the other hand, the "Bottom-Up" considers the efforts of each individual region. According to the literature, systems can be of two kinds "Branch" and "Territorial" (Butova *et al*. 201 Kowalski and Conway, 2019).

The "Socio-Economic" investigation of the "Territorial" system of the "Lower Amudarya" region in Uzbekistan includes three main levels of regions; the high level represents "Karakalpakstan" and "Khorezm" regions, while the second level is represented by rural districts and cities. The third level is represented by rural citizens'

gatherings. These three levels represent three separated systems but at the same time they are intertwined, which is a critical issue (Zimdahl, 2018). In a general speaking, systems are structured as components that in turn include elements, which cannot be separated.

In this work, the element "QAP" is considered primary in the system. Therefore, the system based method is considered "Complex". However, at the same time, it is considered highly efficient. This kind of analysis is closely connected with the economic "Territorial" system and is necessary in regional policy development of a country (Nicholson *et al*., 2018).

Complex methods can be considered an important methodology in geography. On the other hand, complexity requires a deep analysis and comprehensive understanding of the area of research. These concepts are well-defined and described by the geographical scientists such as "LS Berg", "VV Dokchaev", and Soliev. They are all in agreement when it comes to methodologies in geography and economic.

The well-known scientist, A. Humboldt, who is the founder of "Natural Geography" concepts. He strongly believes that the phenomena in "Nature" and "Society" are highly correlated to the economic and natural factors. Also, the comprehensive understanding of the general geographical laws can positively contribute to enrich the knowledge-base of researchers when performing projects in the area considered in this work.

Regional complexities should be accurately interpreted using a comprehensive approach and predefined goals. The idea of complex approaches is close to look at system components in a close view. Also, these approaches enable to look at the problem from different angles and different point of views. Therefore, complex approaches have a more "horizontal" views including internal and external views as well as they reflect a "vertical" view to the problems (Mansfield, 2021).

On the other hand, the comprehensive and systematic approaches are closer to "Mapping". In addition, the generalization of these approaches provides positive and visual research outcomes. Furthermore, the "Card" is a research tool that represents a "Small Model" of the studied object. In this method, "all primary event information is firstly reflected, summarized, and summarized, and then used to draw conclusions, conclusions and practices" (Nazarov, 1997).

Moreover, it is more desired to describe "Social Objects" on a map of small territories. It is also worthy to reflect other objects such as farms and medical fields aiming to provide more information. Other approaches such as forecasting-based methods and sociological-based methods can play a key factor in studying the geographical and economical features of rural areas.

In "Questionnaires" method, the information provided by them can be primarily used to evaluate many aspects (e.g., living conditions, infrastructure, demographic information). It can also be used to evaluate the environmental and "Nosogeographic" situation. This kind of methods may be used when there is a lack in statistics that reflect a real situation of interest. Furthermore, this method is crucial in the case of evaluating the potential population migration (Gangil *et al*., 2010).

The methods that are based on modeling problems can also be considered efficient. The term "Model" - is originally came from the Latin word "modulus". It reflects different meanings such as "measurements", "samples", or "norms". A model can be used to project a particular phenomenon, process, or events in a statistical or

mathematical form. There are many ways that can be used in the modeling process and the literature of social geography and economic is rich of such explanation.

In statistical and mathematical methods of socio-geography and economic problems, the data represents the "raw material" of the model. The generated model uses this data and processes it in order to extract facts or predict future events. These methods were proved to be highly efficient and provide effective performance in socio-geography and economic issues.

Typically, the "Spirman Coefficient" can be utilized in investigating the correlation between two eventsas follows (Musurmanova, and Ismailova, 2020 Gangil *et al*., 2010):

$$Q_s = 1 - \frac{6\Sigma(d^2)}{N(N^2-1)}; \quad (3)$$

Where d' denotes the square difference. Q. denotes the correlation coefficient, and N denotes the total number of elements. For instance, using Equation 3, we are able to detect the existence of a correlation between the level of "urbanization and birth rates" in rural areas of the "Lower Amudarya" economic district. The situation leads to have Qs=-0.01 when involving the real values of the variables in the Equation 3.

According to the aforementioned, there is no "significant relationship between "urbanization and fertility" in this region. The results of worldwide countries reflected a declined birth rate in the highly "urbanized" regions. It should be mentioned that the "interdependence" between "urbanization" and the "regeneration of the population" is not clearly noticed the country's other areas and regions: This reflects the fact that the process of urbanization is not really significant. Table I presents the correlation between the density and composition of land resources in the 12 regions considered in this work (in Uzbekistan's dataset).

Table 1: The correlation between density and composition in Uzbekistan regions.

Regions	**Irrigated lands**	**Population**	**Differennce**	**d^2**
Region 1	2	1	1	1
Region 2	11	11	0	0
Region 3	10	10	0	0
Region 4	8	9	-1	1
Region 5	13	13	0	0
Region 6	5	3	2	4
Region 7	7	5	2	4
Region 8	9	8	1	1
Region 9	1	6	-5	25
Region 10	6	7	-1	1
Region 11	3	2	1	1
Region 12	4	4	0	0

According to the table, the value of Qs=-0.9. These findings are interesting since they reflect important information to researchers.

As a result, for the considered regions, there exist a strong correlation between the "Share of Irrigated Land" and the "Population Density" in the land fund. Moreover, studying the "sub

regions" needs to determine the district networks. In this regard, the following equation can be used as follows:

$$C = \frac{T}{T_2} \div \frac{H}{T_2} = \frac{T\ x\ H_2}{T_2\ x\ H} \qquad (4)$$

Where C denotes the "Index of Specialization", the term H: denotes the "Regional Population". The value of 7 represents the total number of "Industrial workers" in the district of interest.

Many works in the literature utilized "Indexing" methods for identifying the "Coefficients of Localization (K1)", "Degree of specialization", "Market Specifications", and "Demographic". The K, can be defined using the following equation:

$$K_1 = \frac{T_r}{S_r}\ x\ 100\ \div \frac{T_m}{S_m} \qquad (5)$$

Where T. denotes "District Industrial Network", S. "Regional Industry". The term m represents the "Regional Industrial Sector", S denotes the "Regional Industry".

Now, the "Coefficient of Industrial Production" (Ka) per capita can be formalized using the following equation:

$$K_d = \frac{T_r}{T_m}\ x\ 100\ \div \frac{A_r}{A_m}\ x\ 100 \qquad (6)$$

T. denotes the number of "Products of the Regional" and Ar represents the "District Branches" of the regional branches. The term T refers to the "Number of Districts" and the term Am representing the "Regional Branches".

Based on Equation 6, the "Coefficient of Industrial Production" of the Shovot district in Uzbekistan was calculated as follows:

$$K_d = \frac{T_r}{T_m}\ x\ 100\ \div \frac{A_r}{A_m}\ x\ 100\ = \frac{94.3}{151.1}\ x\ 100\ \div \frac{1025.1}{1683.7}\ x\ 1000 = 624x100$$

Table 2 presents the values of some regions compared to other regions in Uzbekistan (benchmarking).

In Region 12, the production coefficient of industrial per capita is 0.30, (in the District of Khonka - 137; in Bogotda - 1,03; in Yangiarik-

Region	Production Coefficient of Industrial/capita
Region 12	0.3
Khonka	1.37
Bogot	1.03
Yangiarik	0.76
Hazorasp	0.63
Kushkupir	0.53
Khiva	0.03

According to the above table, the districts of "Khonka" and "Bogot" outperformed the regional middle level. Also, it can be observed that "Khiva" obtained the lowest index among the considered regions.

The "Market Specialization" level of industrial sectors represents: S-g. Where the Si represents the market specialization and the term g denotes the share of district (%). Now, if the goal is to evaluate the location of "Service Providers", it is needed to identify the level of service. The following equation express the context:

$$R_i = \frac{\sqrt{S_i}}{n} \qquad (7)$$

Where denotes "Service Area" of the term Si service area (area) and n denotes the total number of service facilities.

The above equation represents the mathematical model that is used in to analyze the "Socio Economic development of small areas "Rural Areas". The formula can also be used in evaluating a real situation.

CONCLUSIONS

This work tried to present a variety of methods that can be used to analyze real situations in the agriculture sector considering geographical, social, and economical aspects. We also provide researchers with many formulas that can be utilized in investigating colorful of aspects in the agriculture sector. The methods presented in this work can be used with large-scale and small-scale areas. The focus was on the small or rural areas.

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CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest regarding the publication of this manuscript.

تأثير الجوانب الجغرافية على التنمية الزراعية في اوزبكستان

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الخلاصة

شهدت السنوات الأخيرة من القرن الحالي ثوره زراعيه في العديد من الدول الناميه والتقدمه وقد تحقق هذا الأمر من خلال تداخل عاملين أساسيين هما العامل الاقتصادي والجغرافي اللذان تحكما في حياتنا اليوميه ويعتبران من أهم العوامل التي أسهمت بأدوار رئيسه في تطوير القطاع الزراعي فالجانب الاقتصادي تمثل دوره في كيفية توفير الموارد اللازمه لزيادة الناتج الزراعي من مختلف أنواع المدخلات عالية الإنتاجية أما العامل الجغرافي فقد تمثل دوره في توفير ما يحتاجه القطاع المذكور من أراضي ومياه وحراره ورطوبه للبنات على اعتبار هذه العوامل تساهم معا في تحقيق الاستمرار في حياة الإنسان لذا فقد جاءت دراستنا لتوضيح كيفية استخدام العوامل الاقتصادية والجغرافيه في تحقيق إنتاج زراعي واسع النطاق كافيا لسد حاجة الاكتفاء الذاتي

مع بقاء فائض للتصدير مع توضيح الاليه التي يؤديها او التي يقوم بها كل قطاع بقصد عرضها على الباحثين العاملين في مجال البحوث الزراعيه ولاسيما في المناطق الريفيه التي يتم فيها نقل أحدث التقنيات الزراعيه إليها بهدف تبنيها من قبل المزارعين ومن أجل تحقيق هذا الهدف فقد تم استخدام عدد من العوامل الاقتصاديه شارك فيها عدد من الباحثين في إعداد دراسات لهذا الغرض في دول أوربا الغربيه لمعالجة كافة الأمور المتعلقه بالإنتاج الزراعي اي توظيف الجوانب الاقتصاديه والزراعيه لتحقيق هدف الزياده في الإنتاج لذا فقد عدت هذه الدراسات الركيزه الأساسية للعديد من الباحثين الزراعيين والمهتمين في زيادة الناتج الزراعي.

الكلمات المفتاحية: الزراعة، المناهج الاقتصادية، المناهج الجغرافية، الاقتصادية الجغرافية، الاستقراء.

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