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Research Paper

Conceptual model of Land Development based on Wheat Cultivation

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ABSTRACT

The country's self-sufficiency in wheat production requires a suitable model for developing its cultivation. This research was conducted to answer how to develop the land base for wheat cultivation with a capacity-based approach and aimed to design a wheat cultivation development model with a qualitative perspective through documentation method, and since there was no theory to explain the phenomenon in question, it was used the grounded theory method. The statistical population includes documentary sources, including scientific articles, theses, books, and scientific reports from relevant centers over 20 years (2000 to 2020), due to their scientific richness, 120 samples were randomly used. After three coding stages, data processing using MAXQDA$_{20}$ software resulted in the extraction of 132 concepts (with 459 repetitions) and 32 subcategories in a 4-dimensional format. The main dimension of wheat cultivation development (dependent factor) with 5 variables consists of economic factors with 10 variables, social factors with 7 variables, and environmental with factors 10 variables. Comparison of MAXQDA's output software model and theoretical model showed that the variable of exploitation type was removed due to non-repetition and relevance, and the variables of age, occupation, and education were combined in the variables of demographic characteristics. Land integration, area under cultivation, irrigation method, price, and cost were added to economic factors; and variables of ownership, education and extension, poverty and destitution, technical knowledge and labor performance were added to social factors; and variables of cultivation type, land use, fallow, optimal cultivation pattern, GDD and use of fertilizers and pesticides were added to climate factors. The variables of cost and production rate in the economic factor, population characteristics and poverty and deprivation in the social factor, climate and type of cultivation in the environmental factor, income increase-yield increase jointly, and preservation of land physiography in the development factor had the highest and lowest recurrences, respectively. The obtained conceptual model can be used for planning the development of wheat-based land, training wheat farmers, and in research and implementation activities.

1. Introduction

Agriculture is the science and technology of producing plant and livestock food products, which, as one of the major consumers of natural resources in the production process, must play an important role in the sustainability of these resources. This means that the level of exploitation of these resources must be managed in a way that maintains their reproducibility over time, and only then will the process of producing agricultural products remain sustainable. A review of the current state of Iran's agricultural system clearly shows that the agricultural systems used, which are referred to as "conventional systems", are often based on the classical agricultural model, which strongly emphasizes the use of external inputs and the increase in the production of commercial and export products. This type of system, while disrupting the balance and equilibrium of agricultural and natural ecosystems, has caused a decrease in fertility and soil erosion, water pollution, an increase in greenhouse gases, deforestation, increased flooding and soil loss, an increase in the consumption of fossil fuels, as well as social problems such as a decrease in the number of farmers and the disruption of the local social system of production and an increase in migration.

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2. Methodology

The research was conducted in two stages as follows: First, by reviewing the theoretical and empirical foundations related to the subject and research objectives, in order to discover a scientific theory for the subject, the records of studies conducted in scientific sources, including books, theses, articles, and related scientific reports, were reviewed. - Then, the initial theoretical model was extracted and designed using a capacity-oriented approach and a data-driven qualitative method in the MAXQDA20 software environment. This research has an applied aspect in terms of its purpose and was conducted with a qualitative perspective. The main source of research data included published documents, such as articles in journals, conferences proceedings, books, and scientific reports related to land-based and wheat cultivation. Data analysis was conducted using the data-driven method through open, axial, and selective coding and in the MAXQDA20 software environment.

3. Results

After three coding stages, data processing using $MAXQDA_{20}$ software resulted in the extraction of 132 concepts (with 459 repetitions) and 32 subcategories in a 4-dimensional format. The main dimension of wheat cultivation development (dependent factor) with 5 variables consists of economic factors with 10 variables, social factors with 7 variables, and environmental factors with 10 variables. Comparison of MAXQDA's output software model and theoretical model showed that the variable of exploitation type was removed due to non-repetition and relevance, and the variables of age, occupation, and education were combined into the variables of demographic characteristics. Land integration, area under cultivation, irrigation method, price, and cost were added to economic factors; and variables of ownership, education and extension, poverty and destitution, technical knowledge and labor performance were added to social factors; and variables of cultivation type, land use, fallow, optimal cultivation pattern, GDD and use of fertilizers and pesticides were added to climate factors. The variables of cost and production rate in the economic factor, population characteristics and poverty and deprivation in the social factor, climate and type of cultivation in the environmental factor, income increase-yield increase jointly, and preservation of land physiography in the development factor had the highest and lowest recurrences, respectively.

4. Discussion

Various approaches and strategies have been proposed to realize the sustainable development model, one of which is agricultural extension and education. Since education and extension were stated as one of the important variables in the social factor, it is therefore suggested that this approach be seriously considered in sustainable agricultural development programs, including wheat cultivation. Agricultural development does not rely only on the principle of efficiency, and is also dependent on the principle of efficiency. The efficiency of the agricultural sector requires the use of experienced promoters and attention to the extension and education system, and new achievements of agricultural science and their timely and appropriate transfer to farmers. Considering the research findings that stated production efficiency as one of the variables of the economic factor, it is therefore suggested that all agricultural executive programs, including the development of wheat cultivation, be accompanied by its extension attachment with the aim of achieving greater efficiency. The research results stated that weather and climate are the most important environmental factor variables in the development of wheat cultivation. It is suggested that, in the context of promotion and education, encouraging local investors and guiding programs for a fairer and more effective allocation of resources based on the land's growth potential in different regions, helps to discover local capacities and respond more efficiently to the regions.

5. Conclusion

The use of information layers by applying new technologies, including GIS, accelerates the possibility of planning based on land potential, and therefore it is suggested that, based on the advantage of crop cultivation, a comprehensive database of basic agricultural information should be prepared, divided into cultivable lands in the plains of the country, and be the basis for planning in the agricultural sector, and with free access to information for operators, they should speed up the development of the agricultural sector. The amount of water consumed per hectare is one of the important economic factors in the development of the land base for wheat cultivation. Fair distribution of production subsidies in the agricultural sector, including the new irrigation subsidy, can help solve this problem.

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