Features Of The Application Of Game Theory In The Tasks Organizational And Economic Mechanisms Greenhouse Economy

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Abstract -

The Article Analyzes The Current Organizational And Economic Mechanism For The Functioning Of Greenhouses In The Republic Of Uzbekistan. Using The Methods Of Game Theory, The Problem Of The Optimal Cultivation Of Vegetables And Fruits In The Greenhouse Has Been Solved. The Subject Of The Study Is The Organizational And Economic Mechanism Of The Functioning Of Greenhouses In The Republic Of Uzbekistan. The Purpose Of The Work Is To Identify Problems In The Development Of The Organizational And Economic Mechanism For The Functioning Of Greenhouses In The Republic Of Uzbekistan Using The Theory Of Games.

According To The Decree Of The President Of Uzbekistan Dated November 20, 2018 "On Measures To Create Additional Conditions For The Development Of Greenhouse Complexes", Another 105 Modern Greenhouses Worth \$ 343.3 Million Will Be Created In The Coming Years. The New Complexes, According To The Document, Will Occupy Another 800 Hectares Of Land. A Significant Part Of Them (47 On 405 Hectares) With A Total Value Of More Than 230 Million Dollars Will Be Created In Tashkent And Samarkand.

Methods: Methods Of Game Theory, Payment Matrices, Analysis, Comparison.

Findings: With The Help Of Game Theory, The Problem Of The Optimal Cultivation Of Vegetables And Fruits In A Greenhouse Has Been Solved.

Conclusions: The Use Of Game Theory Can Be Of Great Help In Constructing Production And Financial Plans In A Greenhouse.

Keywords- Greenhouse Management, Agricultural Producers, Game Theory, Organizational And Economic Mechanism, Vegetables And Fruits.

INTRODUCTION (HEADING 1)

In View Of The Tense Economic And International Situation, Food Supplies Today Occupy A Special Place In The Priorities Of State Policy. In Solving The Problem Of Increasing The Self-Sufficiency Of The Population With Food, The Main Role Belongs To Areas In Which The Effective Economic And Economic Activity Of Agricultural Producers Is Of Great Importance For The Economy. Today, Business Entities Need To Create Conditions That Ensure A Consistent Process Of Continuous Reproduction Of Agricultural Products. That Is Why It Is Necessary To Have Appropriate Organizational And Financial Mechanisms For The Sustainable Development Of The Industry In The Region (5, P. 1378).

The Term "Organizational-Economic Mechanism" Of Agricultural Development Should Be Understood As The Interaction Of Problems Of Production Relations On The Basis Of Economic And Administrative-Legal Levers And Effective Forms Of Organizing Social Production Processes That Ensure The Sustainable Development Of Agricultural Sectors (3, P. 45). The Main Functions Of Organizing And Managing Finances Are: Creating Favorable Economic Conditions, Increasing The Efficiency Of Production Activities, Ensuring The Competitiveness Of Products, Increasing The Interest Of Employees And Teams In The High Economic Performance Of The Enterprise, Ensuring High Quality Transformation Of The Company, Material And Technical Base.

In This Paper, We Study The Possibility Of Using Game Theory In The Tasks Of The Organizational And Economic Mechanism Of The Greenhouse.

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I. MATERIALS AND METHODS

To Solve The Research Problem, The Following Situation Was Chosen. The Transition To New Agricultural Equipment. Experts Found That If Successful, There Is A Chance That (70%) Will Receive 1.5 Of The Profit That Can Be Obtained With Old Equipment. Otherwise (30%), The Company Will Lose 0.3% Of Profit If The Equipment Does Not Meet Expectations (Often Failing, Producing Defective Products). At The Same Time, You Can Take Advantage Of Additional Equipment Maintenance Services With A One-Time Profit Of 0.5, The Probability Of Success In This Case Will Be 90%. It Is Also Possible To Partially Install New Equipment. In This Case, The Probability Of Success Will Be 60%, Profit Will Be 1.1, And Losses - 0.05. The Cost Of Additional Services In This Case Will Be 0.3 Of The Standard Profit, And The Chances Will Remain The Same. You Need To Determine The Best Option.

II. LITERATURE REVIEW

The Agro-Industrial Complex Is An Integral Part Of The Productive Forces Of The Republic Of Uzbekistan, Is Subject To The General Laws Of Economic Development Of The Region And Is Specific, With Its Own Characteristics. Today, The Economic Situation Of The Greenhouse Economy In The Region Is Characterized By Instability, Problems Of Economic Growth Continue To Exist, And The Organizational And Economic Mechanism Should Create Conditions For An Effective Economic System In The Industry. The Profitability Level Of Agricultural Organizations, Including Subsidies, In 2019 Reached 5.9% Of Rural Households (21.8%). Without Government Support, Production Efficiency Was -32% In Agricultural Enterprises And -29.6% In Agricultural Holdings. This Shows That The Financial Management Mechanism In The Region Does Not Fully Meet The Tasks Set For It And Is Characterized By The Destruction Of Agricultural Potential, The Problem Of Adapting Agricultural Products To Market Conditions And Ineffective Fiscal And Credit Policies (17, P. 104).

In Modern Economic Conditions, Only Those Business Entities That Introduce Innovations And Basic Scientific And Technological Achievements Based On The Use Of New Generation Technologies And Efficient Production Methods That Allow Rational Use Of Resources And Reduce Costs Can Satisfy The Requirements Of Competition. Therefore, The Modernization Of The Technological Sphere Of Production, Associated With The Transfer Of Agricultural Enterprises To New Generations Of Equipment And Technologies, Plays An Important Role In The Sustainable Development Of Greenhouses.

It Is Recommended That Technical And Technological Modernization Of Production, The Development Of Information Systems And Marketing Activities In Agriculture In The Region Be Included In The Group Of Innovative Industries To Improve The Organizational And Financial Mechanism. The Development Of Agriculture In Many Respects Depends On The State Of The Material And Technical Base Of Farms And, Above All, On The Safety And Accessibility Of The Fleet Of Engines And Tractors. In 2019, In Agricultural Organizations, As Compared To 2018, Only 4 Tractor Parks Increased By 4 Units, In Agricultural (Agricultural) Enterprises - By 12 (10, P. 490).

Under Such Conditions, Problem-Setting With The Help Of Game Theory Helps A Lot.

III. RESULTS

According To The Task, Calculations Are Carried Out (From Left To Right, The Standard Profit Is Taken As 100):

- 1) 127.5 12 50 = 65.5
- 2) 120-16-50 = 54
- 3) 93.5-0.75-30 = 62.75
- 4) 66-2 = 64

According To The Information Provided, The Best Option For The Company Will Be The Transition To New Equipment Using Additional Services. However, The Final Prices For Other Options Do Not Differ Much From The Optimal Ones, So They Can Also Be Taken Into Account. You Do Not Always Need To Rely On Data From One Analysis. It Would Be Advisable To Conduct A Comparative Analysis Of Old And New Equipment. Approximate Indicators For Comparing Equipment Can Be (13, P. 63):

- 1) The Cost Resulting From The Operation Of The Equipment;
- 2) Reliability
- 3) Maintenance

- 4) The Cost Of Consumables And Replacement Parts And Their Availability On The Market;
- 5) Ease Of Use
- 6) The Useful Life Of The Equipment.

It Is Also Worth Considering The Possibility Of Using Additional Services That Make It Possible To Quickly Solve Problems With Equipment, Focusing Employees On The Proper Use And Maintenance Of Equipment With The Possibility Of Improving It. However, It Is Possible That The Services Will Be Provided Not In Accordance With The Contract, But "Through The Sleeves", And It May Be Necessary To Strengthen The Quality Control Of Work, Which May Increase The Cost.

The Choice Of The Partial Application Of The Equipment From A Purely Logical Point Of View Is The Most Correct, As Before The Full Transition To Something New Is Necessary To Test The Equipment, Determine The Nuances Of Working, To Compare The Performance On Ba Ve Results Of Old And New Equipment, I Prepare Supervisors To Equipment That Will Teach Staff At Work With New Equipment. If Deficiencies Are Found, There Is No Need To Completely Recall Or Modify All Equipment, Which Will Cost The Company High Cost Or Downtime. Partial Use Is Widely Used When Changing The Leadership Of The Company And Is Very Effective Because It Pushes The Company To Growth And Improvement, While Guaranteeing Stability In The Work Of The Company (4, P. 127).

There Is Still The Opportunity To Reject The Application. In This Case, The Company Does Not Lose Anything, But Never Wins. This Option Is Used In A Conservative Policy, It Makes Sense When The Company Receives A Stable Income And Does Not Seek To Increase Profits. The Decision To Be Inactive In Relation To Something Can Have A Positive Effect. For Example, Some Companies Expect Other Companies To Innovate And Track The Success Of Their Applications. Thus, Such Companies With A Conservative Strategy Minimize The Risk Associated With Innovation, Applying Them After Confirming Their Effectiveness, And Received Several Corrections For Consistent Work.

Summing Up All The Options, I Can't Recommend Any Particular One, Since Each Case Has Its Own Specifics, Which Should Be Taken Into Account. When Making Decisions, It Is Sometimes Dangerous To Approach All Issues With A Universal Template Solution Based On Analysis, It Is Worth Considering All The Nuances Of The Problem If It Is Directly Related To Production, That Is, To The Main Activity Of The Company, As In This Case.

Table 1. Matrix "Business Screen"

Strengths:	Weaknesses:
Stable Number Of Orders From Regular Customers	Narrowly Focused Production As A Result Of The
Product Simplicity, Widespread Use	Inability To Maneuver In Case Of Low Demand
• A Small Company Allows You To Manage It More	Limited Number Of Suppliers And Consumers
Efficiently.	Consumer Addiction
<u>Opportunities</u>	Threats:
• Expansion Of Production When New Orders Appear.	Emergence Of New Competitors For Vegetable Growing
• Expansion Of The Product Range	Appearance Of Substitutes
New Consumer Contracts	Reduced Demand For Vegetables
	Delays In The Supply Of Raw Materials From Suppliers
	Invisible Circumstances

The Effectiveness Of This Method Is To Find The Best Option In Conditions Of Complete Uncertainty. This Method Is Used When There Are Many Alternatives And Several Possible Scenarios For The Development Of Events, Which, As A Rule, Cannot Be Influenced. The Effectiveness Of The Method Depends On The Accuracy Of Forecasting Alternatives In A Particular Scenario. For Example, With A Specific Demand, It Will Be Possible To Achieve A Certain Volume Of Production (18, P. 236).

Choosing The Best Strategy Adapts To Many Criteria, Based On Which You Can Determine The Best Option. You Can Also Use A Balanced Assessment Of Criteria If A Topic Prefers One Criteria To Another.

For Greenhouses, The Criteria For Choosing The Optimal Strategy Are Applied In Cases Of Product Selection, When Demand For Them Is Unknown, With The Expansion Of Production And The Expansion Of The Product Range. An Important Factor

In The Effectiveness Of This Method Is The Accuracy Of Predicting The Results Of Choosing An Alternative Under Certain Conditions. The Greatest Accuracy Is Facilitated By Statistics Of Recent Years, Observations And Conclusions Of Expert Groups. However, The Expansion Of Trends Cannot Always Give Accurate Forecasts, Especially In Our Time. Therefore, It Is Also Worth Considering Current Trends, Industry Development Experience.

IV. DISCUSSIONS

A Greenhouse Sells Its Products Through Shops. Sales Are Weather Dependent. The Cost Of Growing Vegetables Is Equal To A0, And Fruits - B0 Rubles, The Sale Price Corresponds To A1 Rubles And B1 Rubles, Respectively [26]. Identify The Best Business Strategy.

A = 1000, B = 2300, S = 1400, D = 700,

A0 = 20, B0 = 5, A1 = 40, B1 = 12.

We Compose A Mathematical Model Of The Problem. In Relation To The Possible Conditions Of Demand, The Company Has Two Strategies.

1. F1 = (1000, 2300) - Produce 1000 Vegetables And 2300 Fruits,

2. F2 = (1400, 700) - Produces 1400 Vegetables And 700 Fruits.

Nature (Market) Also Has Two Strategies:

1. D1 =The Weather Is Hot,

2. D2 = The Weather Is Cool.

If The Company Adopts The F1 Strategy And The Demand Will Indeed Be In The First State, That Is, The Weather Will Be Hot (D1), Then The Products Will Be Completely Sold, And The Income Will Be W11 = $1000 \cdot (40-20) + 2300 \cdot (12-5) = 36100$.

If The Company Adopts The F1 Strategy And The Demand Is In The D2 State (The Weather Is Cool), Then The Fruits Will Be Sold Only Partially, And The Income Will Be: $W12 = 1000 \cdot (40-20) + 700 \cdot (12-5) - (2300-700)$. 5 = 16900.

In The Same Way, If The Company Chooses Strategy F2, And Nature Chooses Strategy D1 (The Weather Is Hot), Then The Income Will Be (Vegetables Will Be Lower):

 $W21 = 1000 \cdot (40-20) + 700 \cdot (12-5) - (1400-1000) \cdot 20 = 16900$, And If Nature Chooses Strategy D2, Then

 $W22 = 1400 \cdot (40-20) + 700. (12-5) = 32900.$

Since The Maxim In Strategy In The Game A = Max (16900, 16900) = 16900, And The Minimum Strategy B = Min (36100, 3290) = 32900, The Value Of The Game Is In The Range

16900 Den Units <N <32900 Den. Units

We Solve This Game By An Analytical Method. The Average Performance Of The First Player, If He Uses The Optimal Mixed Strategy X' = (X1', X2') And The Second Player, The Pure Strategy Corresponding To The First Column Of The Payout Table Is Equal To The Value Of The Game N:

 $36100 \cdot X1' + 16900 \cdot X2' = N.$

The First Player Receives The Same Average Odds If The Second Player Applies The Strategy Corresponding To The Second Column Of The Payroll, I.E.

16900 X1 + 32900 X2 = N.

Thus, The Company Optimally Grows 1218 Kg Of Vegetables And 1427 Kg Of Fruit.

Conclusions

Summing Up The Study, We Can Formulate The Following Conclusions. The Agricultural Sector Is The Most Promising In The Economy Of The Republic Of Uzbekistan. Game Theory Is Widely Used In An Innovative Economy. In Recent Years, The E Value Has Increased Significantly In Many Areas Of Economics And Social Sciences. In The Field Of Finance, This Applies Not Only To Solving Common Financial Problems, But Also To Analyzing The Strategic Problems Of Companies, Which Contributes To The Selection Of The Main Production Sector And The Adoption Of Optimal Management Decisions. The Application Of Game Theory Contributes To The Successful Development Of Greenhouses.

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