# THE INVESTMENT STRUCTURE, PRODUCTION, FINANCIAL AND ECONOMIC INDICATORS IN FISH FARM ACTIVITY. THE DEVIATIONS AND THEIR MEANINGS

Eng.Camelia Luchian

University of Agricultural Sciences and Veterinary Medicine, Bucharest, 59, Marasesti Marasti, sector 1, Bucharest, Romania 011464

Phone; Email-luchian_camelia@yahoo.com

**ABSTRACT :** The production, the income and the expenditures on the total and also on the main structural elements in this paper, reveals levels and also limits on fishing activities specific indicators. Through the standard deviation and the variation coefficients, that are physical and on percentage played, it was possible to characterize the investment structure in the fish farm Blăgeşti establishment, but also the production activity in the first five years. Through the given values levels, it has been able to ascertain the fish farm production risk and the appreciation made through the values obtained frames a small variation (values below the 10% level). It has resulted that the production and income carried out from fisherieson the five-year period covers  correlation variations, direct, which shows a low variation level for all statistical indicators analyzed.

**Key words**: Financial, Economic, Fish farm, deviations

## INTRODUCTION

Through the analized indicators at the fish farm Blăgeştilevel,we tried to highlight the accomplishing levels the projectedparameters: on one structure side of the four fish species (Common Carp, Bighead Carp, Crucian Carp,Phytophageous), and on the other hand in the studied dynamic (five years period). Under this double aspect, there were differentiations that influence sequentially: the investment level and his derived indicators, production levels, income, expenses, and financial results.

Note the balance position, the house and banks accounts that comprise the available cash amount at the end of each operational year. These values are correlated with the indicator values "Current Cash Available estimated in Cash-Flow". At the same time, the capital circulating took into account in the liquid flow calculation, because certain risks could materialize, resulting an additional funding well above the estimated level [1].

To capture these issues we used the deviation (mean square, standard and confidence limits) and the variation coefficient (by significance degrees) and they were expressed in the same measure unit of the studied characteristics. Further, we pursued the fish farm production risk quantification through the level of the values obtained , appreciation being assigned to a small variation (values less than 10% level). Actually, the use of deviation in the indicatorsinterpretation, has given the opportunity to resolve some knowledge issues relating to the fish farm[2]: Thehomogeneity issuesanalysis of the data from which were found theproduction indicators , incomes and financial results and check their representative character; -Comparisons over time (five years) and space, of several distribution data after independent and / or interdependent characteristics;

- The separationbetween the essential factors and the random factors. For individual manifestation forms ofthe analysis phenomena in the fish farm situation, it was found a variability existence. In the proper use of indicators interpretationsit was necessary to know the veracity in the recorded values establishment and representativeness. Depending on this purpose of the analysis undertaken it was given the opportunity to study/activities on fish farm performance.

Checking the homogeneity of the indicators required individual values  to determine the variation coefficient (defined as the ratio between the standard deviation and the arithmetic mean of the observations ensemble). Confidence limits for the risk level of 90% (were those given by the expression: $p = 90\% \Rightarrow X (+/-) 2, 13 * X_{med}$). As the variation coefficient has a lower value, thefeature average is more representative for the studied statistical community and therefore the community is more homogeneous. Usually , it expressesas  percent, where it can take values between 0 and 100.As the value is smaller, the statistical series is more homogeneous and therefore the average is more representative.

The coefficient values determination is given by the formula:

C%= σ/ x  *100

It was estimated that a variation value less than 30% attest a community good homogeneity degree and respectively of average value representativeness. "Significance" given such opportunity as appropriate, to know the level of achievement of the various situations, in appreciation of the meaning of fish farm. Further, „the significance" has given the possibility that if necessary, to know the achievement level of the various situations in assessing the fish farm functional meaning.

## RESULTS AND DISCUSSIONS
### The investment and the fish farm profitability level .

By determining some indicators of investment level in the fisheries sector, through appropriate interpretation, we can know theprofitability level, and further it can delineate the indebtedness level dynamics of the projected fish farm during the exploitation years .

Regarding the fish farmBlăgeşti investment and the recovery period, presented in *table 1* , you can deduct the following:

**Table 1.The investment and the fish farm recovery duration.**

| The Indicator | UM | Indicator value |
|---|---|---|
| The investment total value | lei | 10417511 |
| Investment at m²  water surface (91600 m²) | lei/m2 | 113,72 |
| Investment at 1000 annual revenue from exploitation (5 years average) | 1000 lei/lei | 4964,50 |
| Investment at 1000 lei  annual operating expenses(5 years average) | 1000 lei/lei | 21832,89 |
| Investment at 1000 lei the annual gross result  (5 years average) | 1000 lei/lei | 6376,04 |
| Investment at 1000 lei the annual net result  (5 years average) | 1000 lei/lei | 7649,52 |
| Average annual from operation income (5 years average)at m² water surface(91600 m²) | lei/m2 | 22,87 |
| Operating expenses at m² water surface (91600 m²) | lei/m2 | 5.21 |
| Gross result at m² water surface (91600 ft²) | lei/m2 | 17,83 |
| Net result at m² gloss water (91600 ft²) | lei/m2 | 14,86 |
| The recovery duration | years | 10,261 |
| Annual investment recovery  (recovery time/total investment) | lei/year | 1015253 |
| Discount rate | % | 8 |
| Net present value | lei | 1765467 |

Data base, the Project "Establishing a fish farm comprised of administrative offices, warehouse, fishing pond and its surroundings, in the unincorporated of village Blagesti, Bacau County." -investment level is of 10, 4 million lei and reported to m² water surface isof 113, 72 lei. By reporting investment income at 1000 lei, gross and net result reveals the existence of favorable levels, corresponding to the initial calculation indicator; -income, expenses and gross and net result compared to production capacity (in m² water surface), frames favorable economic results (with reference to the income which is about 5 times more than expenses); -the recovery duration of 10,261 years, compared with the previous indicators, give us guidance levels relating to the annual investment recovery , discount rate and net present value. Next, through thecapital rates, the indebtedness and cash availability could be synthetized the profitability level of the fish farm Blăgeşti.

In table 2 for the five years period at the mentioned indicators, we may perform the following interpretations:

**Table 2- The rentability level andthe indebtedness dynamics at the projected fish farm within the exploitation years.**

| The Indicator | UM | Year I | Year II | Year III | Year IV | Year V |
|---|---|---|---|---|---|---|
| The exploitation rate | % | 75,08 | 77,15 | 78,57 | 77,61 | 77,45 |
| The capital invested return rate | % | 12,40 | 14,17 | 16,05 | 16,19 | 16,26 |
| The Indebtedness rate on medium and long term | % | 27,73 | 22,92 | 18,50 | 14,59 | 11, 12 |
| The cash availability at the end of the period | lei | 1413616 | 2889457 | 4561658 | 6247921 | 7941769 |

Data base, the Project "Establishing a fish farm comprised of administrative offices, warehouse, fishing pond and its surroundings, in the unincorporated of village Blagesti, Bacau County."
-In respect to the exploitation capital rate , it oscillates between 75, 08% and 78, 57%, with a slight declining trend lately; -Regarding the capital invested rentability rate ,the trend indicates an annual growth rate from 12,40% in the first year at  16,26% in the fifth  year ;
-the indebtedness rate on medium and long term decreases, so that in the last year it arrives to 11, 12%;
-The cash availability at the end of the period, records annual significant increases.
Especially, the cash flows schedule, using the cash flow calendars for the five years, but also monthly, indicated a moment of time at which that amount shall be charged or paid.
Regardless of the project evaluation or to make the necessary funds modifications, the cash flow programs are related to the annual/ monthly operations calendars[3].

**The production statistics indicators and the fish farm incomes**.
The analyzed indicators highlights the achievement levels of the two-dimensional projected parameters: on one side of the four fish species structure (Common Carp, Bighead carp, Crucian Carp, Phytophageos ), and on the other hand in the annual studied dynamics (five years). Under this double aspect there were differentiations influencing successively the production, incomes, expenses and financial results at the end. To capture these issues, we used the deviation (mean square, standard and confidence limits) and the variation coefficient (by significance degrees).
Total fish production and by species analyzed in the indicators structure that are given in *table 3*, follows the specific meanings capture of the at theBlăgeşti fish farm level. In the species structure and for the period of 5 years, the following may be considered:

**Table 3- Statistical indicators for total production and on fish species (during 5 years)**

| Specification | Average | Mean square deviation | limits for p = 90% | | The standard deviation | Coefficient of variation | The Significance |
|---|---|---|---|---|---|---|---|
| | to | to | to | | to | % | |
| | | | maximum | minimum | | | |
| Common Crap | 72.90 | 1.48 | 76.04 | 69.76 | 6.91 | 9.48 | small |
| Phytophageous | 26.20 | 0.85 | 28.01 | 24.39 | 1.90 | 7.25 | small |
| Crucian Carp | 5.98 | 0.12 | the days | 5.92 | 0.26 | 4.35 | small |
| Bighead Carp | 29.60 | 0.65 | 30.98 | 28.22 | 1.45 | 4.90 | small |
| Total | 134.68 | 3.09 | 141.26 | 128.10 | 6.91 | 5.13 | small |

Data base, the Project "Establishing a fish farm comprised of administrative offices, warehouse, fishing pond and its surroundings, in the unincorporated of village Blagesti, Bacau County."
- the annual averagehighlights very high limits within the fish species analyzed, these being between 72,90 tones at Common Carp and 5,98 at the Crucian Carp, compared to the total average which is of 134,68 tons. As a result, the mean square deviation amplitude is between 1.48 at Common Carp and 0.12 at Crucian Carp, level that per total is of 3,09 tons.
Therefore, the confidence limits for the risk level of 90% (which are given by the expression: p = 90% = > X (+/-)2,13* Xmed), which includes maximum variations for Common carp species (maximum 76,04 and minimum 69,91 tons) and for Crucian carp (between 6.04 and 5,92 tonnes). At the ensemble levelof the four fish species are the biggest risk limits (between 141,26 and 128,10 tons);
-Analyzing the standard deviation and the variation coefficient  of the values rendered in tons and percentage, played by classes of values, you can find: for the standard deviation  we have maximum levels, identical in the case of Common carp species, but also on the total fish amount , the coefficient of variation (given by the formula: C% = σ/ x  *100), indicates a maximum for Common carp (9,48%), after which other species levels decrease (from 7.25% to 4,35%). Through all this, you can quantify the risk of fish farm production through the obtained values, the appreciation is at a little variation (values less than 10%).
*Total Income from pisciculture*, which further are taken under discussion seeks to highlight the levels variations and the default interpretative significance for the risk. In *table 4* the whole structure is rendered in value and percentage to which the indicators can be interpreted as follows:

**Table 4-Statistical indicators for total incomes and on species (made during the 5 years period)**

| Specification | Average | Mean square deviation | limits for p = 90% | | The standard deviation | Coefficient of variation | The Significance |
|---|---|---|---|---|---|---|---|
| | MDL | MDL | MDL | | MDL | % | |
| | | | minimum | maximum | | | |
| Common Crap | 1020.60 | 20.66 | 1030.93 | 1010.27 | 46.20 | 4.53 | small |
| Phytophageous | 262.00 | 8.50 | 266.25 | 257.75 | 19.00 | 7.25 | small |
| Crucian Carp | 59.80 | 1.16 | 60.38 | 59.22 | 2.6 | 4.35 | small |
| Bighead Carp | 296.00 | 6.48 | 299.24 | 292.76 | 14.5 | 4.90 | small |
| Total | 2098.40 | 37.92 | 2117.36 | 2079.44 | 84.80 | 4.04 | small |

Data base, the Project "Establishing a fish farm comprised of administrative offices, warehouse, fishing pond and its surroundings, in the unincorporated of village Blagesti, Bacau County." - average and the mean square deviation signifies income amplitudes which in the fish species structure are differently represented. Of the four species, Common carp records boththe highestaverage as well as thehighest mean square deviationvalue  (1020,60 and 20,66 thousands lei). The confidence limits for p = 90%, also have the highest values, which for the Common Carp record both extremes (minimum and maximum), which means a low risk degree;
-in the standard deviation and the coefficient of variation case we found reported differentiation especially by the different values of these indicators. If the standard deviation has successive proportionalvalues with the  income (maximum for Common Carp  and minimum for  Crucian carp), the coefficient of variation is at a  maximum level at Phytophageous fish    and minimum at the Crucian Carp (the amplitudes being of 7.25% and 4.35%. The significance of the values obtained for the species ensemble  is lower than 10%, the variance is considered small.
It results that the production and income from pisciculture realized on the five-year period covers correlative variations, we can say direct, which shows a small variation  to the level of  all statistical indicators analyzed.

**Statistical indicators of total farm expenses**

Total expenses and on expenditure elements , analyzed through the significance of statistical indicators seeks to highlight the trends of some specific phenomena to these categories of consumption value. These expenses are analyzed for the 5 yearsperiod , both on the total, but also in their structure. The levels of these indicators are presented in *table 5,* resulting the following:

**Table 5.Total expenses statistical  indicators and on expense items (during 5 years)**

| Specification | Average | Mean square deviation | limits for p = 90% | | The standard deviation | Coefficient of variation | The Significance |
|---|---|---|---|---|---|---|---|
| | MDL | MDL | MDL | | MDL | % | |
| | | | minimum | maximum | | | |
| Material expenses | 228.88 | 1.63 | 229.70 | 228.07 | 3.64 | 1.59 | small |
| Expenditure on staff | 12.10 | 1.04 | 12.62 | 11.58 | 2.33 | 19.28 | medium |
| Amortization expenses | 177.01 | 5.74 | 179.88 | 174.14 | 12.834 | 7.25 | small |
| Other operating expenses | 53.76 | provides .46 | 53.99 | 53.53 | 1.02 | 1.90 | small |
| TOTAL operating expenses | 471.75 | 8.87 | 476.19 | 467.32 | 19.83 | 4.20 | small |

Data base, the Project "Establishing a fish farm comprised of administrative offices, warehouse, fishing pond and its surroundings, in the unincorporated of village Blagesti, Bacau County." -the average shows that material and amortization expenses recorded the highest levels (228,88 and 177,01 thousands lei), and with the same trend we see the confidence limits st for different riskdegrees (p = 90%).The mean square deviation is maximum on amortization (5,47 thou. lei) compared to the materials expenses(1,63 thou. lei);

-the standard deviation is at a maximum level for amortization expenses (12,834 thou. lei) compared to other expense categories (which are between 1.02 and 3, 64 thou. lei). The coefficient of variation through the levelsdifferentiation for expenditure items analyzed differentiates: a small variation (under 10%) for material expenses, amortization, other expenses and the total; a middle variation for staff expenses (in which case the coefficient of variation is 19, 28%).

From the analysis of both total expenses and the main structural elements of them, it follows that they are subject to variations, whose meanings are differentiated.Respectively, material expenses, which occupy the highest share and record the smallest variations and the staff expenses, with the lowest share, and the maximum variation.

### Statistical indicators of total fish farm economic results.

Economic performance statistical indicators on total farm,throughthe same comparison system, fills in a synthetic form thesides interpretation of income/performance and of the net result. In table 6 are shown the levels of these statistical indicators:

**Table 6.Statistical indicators of economic performance on total fish farm (during 5 years)**

| Specification | Average | Mean square deviation | limits for p = 90% | | The standard deviation | Coefficient of variation | The Significance |
|---|---|---|---|---|---|---|---|
| | MDL | MDL | MDL | | MDL | % | |
| | | | minimum | maximum | | | |
| Total income | 2098.40 | 37.92 | 2117.36 | 2079.44 | 84.80 | 4.04 | small |
| Total expenses | 471.75 | 8.87 | 476.19 | 467.32 | 19.83 | 4.20 | small |
| Total net result | 1361.85 | 25.42 | 1374.56 | 1349.14 | 56.844 | 4.17 | small |

Data base, the Project "Establishing a fish farm comprised of administrative offices, warehouse, fishing pond and its surroundings, in the unincorporated of village Blagesti, Bacau County."

-From the average and mean square deviation analysis, it is found the level of the mean square deviation for incomes is at a maximum level (for a level of 37 920 lei) and minimum expenses (being of 8870 lei). Further, the confidence limits for different risk degrees (p = 90%),the analyzed indicators register in the same stages;

-Thecoefficient of variation reflects similar levels (the obtained values being between 4, 04% and 4, 2%), which is why the significance for the analyzed indicators signifies a small variation.

In this way, the result of statistical dataprocessing captures the specific traits of this fish farm, existing also extreme interpretative situations. It is for this reason that the average has been supplemented with indicators that characterize the mean square deviation and the coefficient of variation. Only in this way the level of these indicators , for the analyzed fish farm play a complex picture of the followed financial-economic phenomenon (with special reference to the low level of the variationcoefficient synthetic indicator), which means the favorable economic trend.

### CONCLUSIONS

As a result of the indicatorsplayed inthe structural analysis for the fish farm Blăgesti, wecan conclude the following:

The performed analyzes forward a structuring on the evolution different segments of several indicators for the five years period (this phenomenon occurring in time), the purpose being the evolution understanding of the production, economic and financial results movement of the fish farm. -The economic and financial indicators deviations level –at the Blăgeşti fish farm levelarising from the statistical processing, highlights the achievement levels of the projected parameters that are focused: on the one hand on the four fish speciesstructure (Common Carp, Bighead carp, Crucian Carp, Phytophageous), and on the other hand on the studied annual dynamics evolution (five years).

Production and total incomes frompisciculture, areseeking to highlight the variability and the interpretative significance of risk. Average and the mean square deviation signify income amplitudes which in the fish species structure are differently represented. Of the four species, Common carp records both the highest average as well as the highest mean square deviation value (1020, 60 and 20, 66 thousands lei). The confidence limits for p = 90%, also have the highest values, which for the Common Carp record both extremes (minimum and maximum), which means a low risk degree;It results that the production and income from pisciculture realized on the five-year period covers correlative variations, we can say direct, which shows a small variation to the level of all statistical indicators analyzed. Analysis of both total expenses and the main structural elements of them, has given the existence of variations whose meanings are differentiated.Total expenses and on expenditure items , analyzed through statistical indicators seeks to highlight trends of specific phenomena such as consumption value categories .- the average shows that material and amortization expenses  recorded the highest levels (228,88 and 177,01 thousands lei), and with the same trend we see the confidence  limits st for different risk degrees (p = 90%).The mean square deviation  is maximum on amortization (5,47 thou. lei) compared to the materials expenses (1,63 thou. lei). The standard deviation is at a maximum level for amortization expenses (12,834 thou. lei) compared to other expense categories (which are between 1.02 and 3, 64 thou. lei). The coefficient of variation through the levels differentiation for expenditure items analyzed differentiates: a small variation (under 10%) for material expenses, amortization, other expenses and the total; a middle variation for staff expenses (in which case the coefficient of variation is 19, 28%). Material expenses, which have the highest share, recorded the smallest variations, and the staff expenses, recorded the lowest rate at which the variation is maximum. Statistical indicators of total fish farm economic results, through the same comparison system, fills in a synthetic form theside's interpretation of income/performance and of the net result. From the analyze we see that mean square deviationlevel, for incomes is at a maximum level and minimum for expenses. Further, the confidence limits for different risk degrees (p = 90%) , the analyzed indicators register in the same stages. The variation coefficient reflects similar levels (the obtained values being between 4, 04% and 4, 2%), which is why the significance for the analyzed indicators signifies a small variation. The datastatistical processingresult captures the specific traits of this fish farm, existing also extreme interpretative situations. It is for this reason that the average has been supplemented with indicators that characterize the mean square deviation and the coefficient of variation. Only in this way the level of these indicators , for the analyzed fish farm play a complex picture of the followed financial-economic phenomenon (with special reference to the low level of the variation coefficient synthetic indicator), which means the favorable economic trend.

Effectively, the investment need and opportunity in the Blăgeşti fishfarm projection can be argued by: using local potential, the economic, technical, social and environmental impact on sustainable regional development, satisfying the consumers demand.But the farm profitability level of this project depends on various factors, such as time spent with establishing project objectives, approvals, the design solutioncompletion, completing contracts and completion of financialmounting, the execution rythm and the amount of work performed and theoperating speed.

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