Economic substantiation for the creation of the seed production center for the soybeans domestic varieties

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Abstract. The article presents the economic substantiation of the project to create a center for selection and seed production of soybeans of the East Siberian ecotype domestic varieties. The aim of the project is the system formation and development for the selection and seed production of the East Siberian ecotype soybeans through the development and implementation of molecular genetics technologies in the selection process and industrial seed production of the crop. The enlarged investment plan of the project is given. The planned production program, pricing parameters for seed material and seed production services are calculated. The dynamics of sales volume for the years of project implementation is reflected, the tax environment of the project is described. The forecast of fixed and variable costs is made. The statement of cash flows and financial results for 5 years of the project implementation is formed. The forecast of the project investment efficiency is presented. The expected effects of the project: economic, social, budgetary, as well as the multiplicative effects are given. As a result of R & D, within the project framework, the following products will be obtained: the set of DNA markers, the germplasm of soybean samples and the seed material of two varieties.

1. Introduction
Selection and seed production play a decisive role in the production of agricultural products and ensuring their competitiveness. The differentiation of natural and climatic conditions in the Russian Federation and the presence of risky farming zones determine the orientation of the domestic selection strategy to create highly productive varieties [1]. A serious problem of the country's food security is caused by the dependence of domestic agricultural producers on the import of planting material and seeds. Among other problems, industry experts note: the low quality of planting material and seeds, the slow introduction of new seed varieties into production, the use of seeds of unknown origin for sowing [2, 3]. The growing need for planting material makes it especially important to develop the domestic production of planting material of the highest quality categories, which is impossible without a developed scientific and selection base [4, 5].

The growing volume of the goods production using soybeans requires more and more high-quality harvests of this plant. Accordingly, producers of soybeans need high-quality seed material, since selection activities and the development of new plant varieties in our country are developing at an insufficient pace [2].

The above mentioned conditions provide excellent opportunities for new players to start a popular and profitable production, the demand for the products of which will significantly raise the economy of the agricultural industry as a whole.
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The aim of the project is the formation and development of the system of selection and seed production of the East Siberian ecotype soybeans through the development and implementation of molecular genetics technologies in the selection process and industrial seed production of the crop.

Expected results of the project:
- the set of DNA markers for the diagnosis of practically significant economic and varietal characteristics of the East Siberian ecotype soybean varieties;
- the germplasm of the East Siberian ecotype soybean samples (field collection) – the carriers of identified resistance, adaptability, and productivity genes;
- the seed material of two varieties and 15 soybean lines of the East Siberian ecotype.

Here is the economic substantiation for the feasibility of the project to create a center for the production of soybean seeds of the East Siberian ecotype domestic varieties.

2. Materials and methods

The capital investment of the project is 284 million rubles; the investment in the working capital of the first years of the project will amount to 84 million rubles. The total investment volume for the project will be 368 million rubles. The consolidated investment plan of the project is shown in table 1.

**Table 1. The consolidated investment plan of the project.**

| №  | Project investment costs                                      | Amount, rubles  |
|----|--------------------------------------------------------------|-----------------|
| 1. | Investments in the preparation and development of production | 284 000 000     |
| 2. | Investments to cover cash gaps in current operating activities | 84 000 000     |
| 3. | Total:                                                       | 368 000 000     |

The planned production program that provides the required economic efficiency of the project, the dynamics of production volume are presented in table 2.

**Table 2. The planned production program.**

| Product/service | Units of measurement | Volume of production in physical terms, per year |
|-----------------|----------------------|-----------------------------------------------|
| Soybean seed    | tons                 | 6000                                          |
| Selection services | services             | 5                                             |

To assess the price situation, the prices of soybean seeds sold on the Russian market were analyzed. When predicting the seed material price, it is necessary first of all to focus on the price level of the main competitors [2].

The results of the study showed that soybean crops grown on the territory of the Russian Federation are sold in three price segments:
- Low segment. The price level for 1 ton of soybean seeds is up to 50.000 rubles.
- The middle segment. The widest segment, the price level is from 51.000 to 64.000 rubles for 1 ton of soybean seeds.
- High price segment. The price level is from 65.000 rubles for 1 ton of soybean seeds.

Based on the chosen strategy of market coverage and "deep penetration" of the soybean seed material market, it is advisable to set prices at the levels shown in table 3.

**Table 3. Pricing parameters.**

| Product/service | Units of measurement | Prices, rubles |
|-----------------|----------------------|----------------|
| Soybean seeds   | rubles/ton           | 50000          |
| Selection services | rubles/service     | 30000          |
Analysis of the project income and expenses is given by year. Table 4 shows what the volume of sales in monetary terms will be, by type of products/services and the expected income level.

Table 4. Dynamics of sales volume by project implementation years.

| Product/service     | 1st year | 2nd year | 3rd year | 4th year | 5th year |
|---------------------|----------|----------|----------|----------|----------|
| Soybean seeds       | 99 750 000 | 299 250 000 | 299 250 000 | 299 250 000 | 299 250 000 |
| Selection services  | 75 000   | 150 000  | 150 000  | 150 000  | 150 000  |
| Total:              | 99 825 000 | 299 400 000 | 299 400 000 | 299 400 000 | 299 400 000 |

In the dynamics of sales of products/services, in accordance with the planned sales schedule, the seasonal factor is taken into account. The activity of growing crops is seasonal, and therefore the maximum amount of income will be received in the 3rd and 4th quarters, respectively.

The project provides for the creation of a center for selection and seed production of soybeans of the East Siberian ecotype domestic varieties on the basis of an advanced agricultural enterprise, so the most acceptable will be the payment of taxes, within the framework of the general tax mode that the existing enterprise already uses.

For the proposed project, in terms of mandatory deductions, deductions to the Pension Fund of Russia (PFR), the Mandatory Medical Insurance Fund (MMIF), and the Social Insurance Fund (SIF) are considered, which are taken into account in the calculations in the cost item "Wages with accruals”. All types of taxes, rates and the order of their calculation are presented in tables 5, 6.

Table 5. Project tax environment.

| Name of taxes paid under the project | Interest rate, % | Tax base | Accrual period |
|-------------------------------------|------------------|----------|----------------|
| PFR                                 | 22               | wages    | month          |
| MMIF                                | 3.7              | wages    | month          |
| SIF                                 | 4.5              | wages    | month          |
| Income tax                          | 20               | income-expenses | quarterly          |
| VAT                                 | 18%              | cost of goods sold (works, services) | quarterly |
| Property tax                        | 2.2%             | average annual property value | quarterly |

Table 6. Tax payment plan.

| Taxes       | Amount for the year |
|-------------|---------------------|
| Income tax  | 37 230 132          |
| Property tax| 1 319 450           |
| VAT         | 38 337 215          |
| Total:      | 76 886 797          |

The cost of organizing the activities will be about 206 million rubles per year. Variable costs are calculated based on the selling price, the share of cost. Variable costs include the cost of purchasing seeds for sowing crops and the conditions for sowing them. The most significant amount of the permanent part of the costs is the cost of R & D – 40.000.000 rubles. Another 11.380.000 rubles are allocated for fertilizers and 9.119.565 rubles for wages, accounting, marketing, utilities, household and office costs, and other costs associated with the implementation of the project.

Annual production costs (seed material/selection services) are presented in table 7.
Table 7. Forecast of fixed and variable costs, rubles.

| Forecast of expenses | 1st year | 2nd year | 3rd year | 4th year | 5th year | Total: |
|----------------------|----------|----------|----------|----------|----------|--------|
| Variable costs       | 6 752 001| 45 000 000| 45 000 000| 45 000 000| 45 000 000| 186 752 001|
| Fixed costs          | 69 432 538| 84 041 477| 84 041 477| 84 041 477| 84 041 477| 405 598 446|
| Total:               | 76 184 539| 129 041| 129 041| 129 041| 129 041| 592 350 447|

Investments in working capital (fixed and variable costs) are secured by investments.

The investment term of the project is 2 years. The full implementation period of the project is 5 years. The long payback period of the project is associated with the organization of a full cycle of seed production. Also, the increase in the payback period is affected by the need for significant additional costs for the construction of facilities, communications and laboratory equipment for the implementation of the project.

The positive cash flow from operating activities is achieved as early as 1 year after the launch of actual activities and receipt of revenue from sales of products, in the future there is a cyclical pattern of income from operating activities (table 8).

Table 8. Cash flow statement for 5 years of the project: forecast by year.

| Operational activities | 1st year | 2nd year | 3rd year | 4th year | 5th year |
|------------------------|----------|----------|----------|----------|----------|
| Sales revenue          | 99 825 000| 299 400 000| 299 400 000| 299 400 000| 299 400 000| 299 400 000|
| Cost forecast          | 76 184 539| 205 928 274| 205 928 274| 205 928 274| 205 928 274| 205 928 274|
| Total operational activities | 23 640 461| 93 471 726| 93 471 726| 93 471 726| 93 471 726| 93 471 726|

| Investment activity | 1 year | 2 year | 3 year | 4 year | 5 year |
|---------------------|--------|--------|--------|--------|--------|
| Founders' investments | 184 000 000| 0| 0| 0| 0|
| Investments in the project | 368 000 000| 0| 0| 0| 0|
| Total investment activity | -184 000 000| 0| 0| 0| 0|

| Financial activity | 1st year | 2nd year | 3rd year | 4th year | 5th year |
|--------------------|----------|----------|----------|----------|----------|
| Receiving a subsidy from the federal budget | 184 000 000| 0| 0| 0| 0|
| Total financial activity | 184 000 000| 0| 0| 0| 0|
| Total project cash flow | 23 640 461| 93 471 726| 93 471 726| 93 471 726| 93 471 726|
| Cash at the beginning of the period | 184 000 000| 207 640 461| 301 112 187| 394 583 913| 488 055 639|
| Cash at the end of the period | 207 640 461| 301 112 187| 394 583 913| 488 055 639| 581 527 365|

3. Results and discussion

For the year, the project's revenue will be more than 299 million rubles, margin profit will be slightly more than 254 million rubles, EBITDA (profit before taxes paid and amortization taken into account) will be 170 million rubles, and net profit will be 93 million rubles (table 9).

Table 9. Report on the financial results of the project for 5 years: forecast by year.

| Indicator      | 1st year | 2nd year | 3rd year | 4th year | 5th year |
|----------------|----------|----------|----------|----------|----------|
| Revenue        | 99 825 000| 299 400 000| 299 400 000| 299 400 000| 299 400 000|
| Variable costs | 6 752 001| 45 000 000| 45 000 000| 45 000 000| 45 000 000|
| Margin profit  | 93 072 999| 254 400 000| 254 400 000| 254 400 000| 254 400 000|
To assess the effectiveness of the project, the indicators calculated for the project as a whole are presented below, taking into account the time factor (discounting) (table 10).

**Table 10.** Forecast of the project investment efficiency.

| №   | Indicator                      | Designations | Values       | Comparison base                                      |
|-----|--------------------------------|--------------|--------------|-----------------------------------------------------|
| 1.  | Discount rate                   | d            | 4.5          | Discount rate                                       |
|     |                                |              |              | Central Bank of the Russian Federation               |
| 2.  | Net present value of income    | NPV          | 132 412 779  | >0                                                  |
| 3.  | Internal rate of return, %     | IRR          | 25           | >d                                                  |
| 4.  | Profitability Index             | PI           | 1.35         | >1                                                  |
| 5.  | Discounted payback period       | PBP          | 3.77         |                                                    |

To obtain the most reliable picture of future payments, the discount rate was adopted at the level of the discount rate of the Central Bank of the Russian Federation, which as of 20.04.2021 is 4.5%.

As a result of investments in the amount of 380 000 000 rubles, within 4 years there will be a return on investment and for the 5th year of the company's activity, an income of 132 412 779 rubles will be received. The indicator PI > 1 shows that for every ruble of invested funds, the project brings 1 ruble 35 kopecks of profit. The project also has a margin of safety (IRR = 25% > d = 4.5%), which will allow to compare the profitability and risks. At the same time, the payback period of the project will be 4 years. In general, the data in table 10 show that the project is cost-effective.

### 4. Summary

The budget effect of the project is expressed in additional tax revenues to budgets of different levels; an increase in tax revenues from other enterprises (using seed material) [6, 7]; additional income tax revenues from employees' wages; revenues to budget and extra-budgetary funds (social protection fund and state employment promotion fund), and other funds (table 11).

**Table 11.** Expected project effects.

| №   | Indicator                        | For the entire project implementation period |
|-----|----------------------------------|---------------------------------------------|
| 1.  | Taxes and fees:                  | 351 589 112 rubles                          |
|     | - to budgets of all levels;      | 333 176 120 rubles                          |
|     | - to the social security funds.  | 18 412 991 rubles                           |
| 2.  | Number of jobs created           | 10                                          |
| 3.  | Projected seed production volume | 30 000 tons                                 |
| 4.  | Net profit of the project        | 397 527 365 rubles                          |

The social effect of the project is to create new jobs. In total, during the project implementation period, 10 jobs will be created with a salary level at the level of the average monthly salary for the industry in the Krasnoyarsk Territory (table 11). The economic effect of the project is expressed in an increase in the project's net profit for the entire project implementation period by 397,527,365 rubles.

Multiplicative effects of the project:
The final consumer of the project’s products is not only agricultural organizations, but also the food industry, animal husbandry, and export markets [8, 9]. Therefore, it is the agricultural organizations that are the link that assesses all the properties of the selection achievement in the aggregate and makes a decision in favor of a particular variety. The implementation of the project will contribute to meeting the needs of agricultural organizations for soybean seed material. Advanced agricultural enterprises of the region will be able to organize large-scale production of soybeans and increase the profitability of production activities.

Thus, the project to create a center for seed production of soybeans of the East Siberian ecotype domestic varieties is attractive, economically, socially and economically efficient, appropriate and necessary for implementation in the Krasnoyarsk Territory.

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