

## SCIENTIFIC AND PRACTICAL ASPECTS OF PROJECT MANAGEMENT FOR PRODUCTION AND REPROCESSING COMPLEXES

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**Summary.** The scientific and practical aspects of project management for production and reprocessing complexes which are created on the basis of new or operating agricultural enterprises have been considered. The introduction of production and reprocessing complex project will provide the additional financial funds for the agricultural enterprise and the increase of technical and technological level of its production.

**Key words:** project, project management, agricultural enterprise, small reprocessing enterprise, production and reprocessing complex.

### INTRODUCTION

One of the new directions providing a high efficiency of modern agricultural production and leading to new technical-technological and social-economic level is the creation of complexity in agricultural enterprises (ACE) activity: from growing the raw material and its storage - to its more complete reprocessing into commodity products. Therefore the theoretical grounding of the expedience and feasibility of the production-reprocessing complexes (PRC) created on the ACE production basis is a current scientific-technical problem.

### THE ANALYSIS OF SCIENTIFIC RESEARCHES AND PUBLICATIONS

Main requirements towards the innovative projects in the programs of villages and their territories development, the identification of projects value, including PRC projects, are worked out in the researches [1,2,3].

A number of scientific publications [4,5,6,7,8,9,10,11,13,14,16,21,24] have been devoted to the important problem of choice equipment and the grounding of the production programmes of small reprocessing enterprises (SRE) (their specialization and power) and management of their functional structures.

The scientific-methodological grounds of the development of projects for the complexes of agricultural raw material growing and reprocessing in ACE have been examined in the researches [11,12,15,17,18,19,20,22,23,25].

## AIM AND TASK OF THE RESEARCH

The aim of this research is to find out the production and technological grounds and the evaluation of PRC projects' creation. The task of this research is to expose the scientific and practical aspects in the relation to the production and reprocessing complexes management created on the new or operating ACE production basis.

## THE RESULTS OF THE RESEARCH AND THEIR ANALYSIS

The agricultural production at the present time is under the influence of both the objective (agri-technical and weather conditions) and subjective (the human factor) character. Therefore, the potential possibilities of ACE in achieving the considerable success in agricultural production are very often dependent on the poorly forecasted and uncontrolled (or not well-guided) factors. This leads to the production inefficiency and financial losses of ACE. As the process of getting the agricultural raw material from preparation to growing up to the sale is long (9-12 months), there is a high probability of substantial money losses of facilities that have invested in the production.

We consider that one of the effective ways of removal of possible risks or their minimizing on one hand, and getting additional profits without any considerable capital investments and current expenses, on the other hand, is the creation of production and reprocessing complexes on the ACE base. The production and reprocessing complex is the agrarian-industrial enterprise which is created for agricultural raw material growing and its reprocessing into the commodity products (Fig. 1).

Agricultural lands, machines, tractors and trucks, stock-raising farms with productive animals and technological equipment, compositions and depositories with equipment and also a few small reprocessing enterprises with their technological equipment are PRC components.

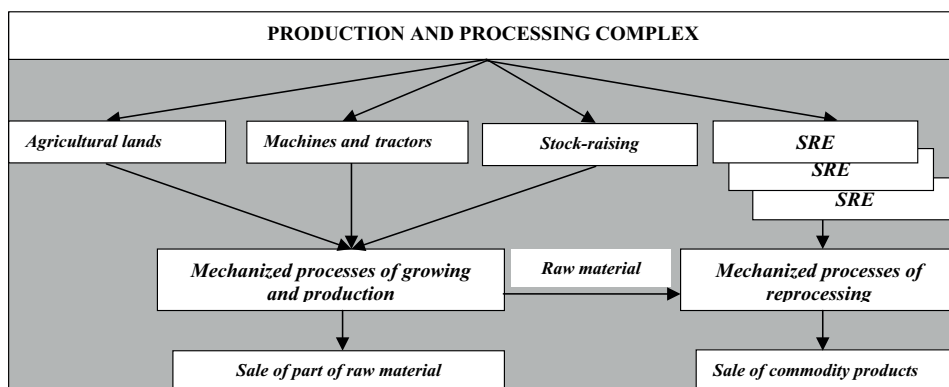


Fig. 1. Scheme of production and reprocessing complex

PRC projects development, in the first place, needs its identification. The process of PRC project identification is demonstrated on the next scheme (Fig. 2).

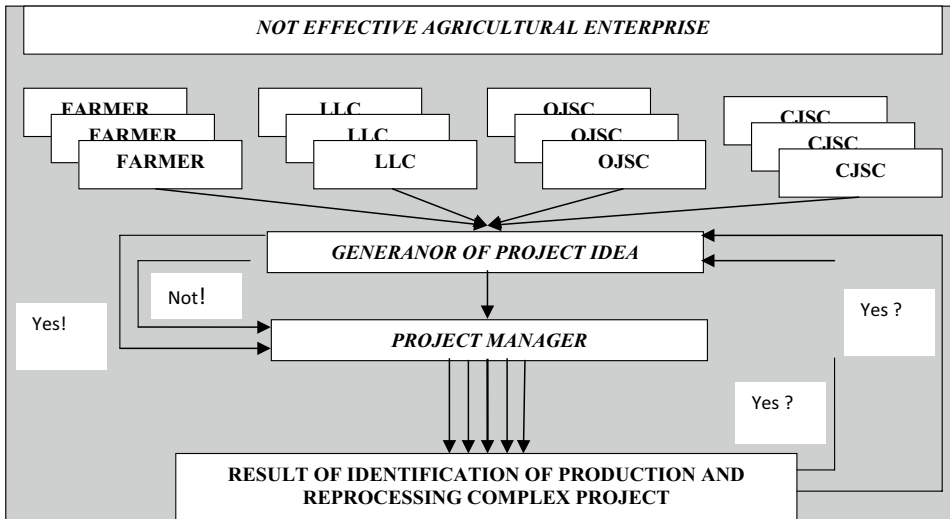


Fig. 2. Process of production and reprocessing complex project's identification LLC - Limited Liability Company; OJSC - Opened Joint-Stock Company; CJSCA - Closed Joint-Stock Company

The project management specialists operatively execute the project identification. However, there must be a person who is the most interested in such project: that is the generator of project idea. The generator of PRC project idea may be a physical or legal person who is mostly interested in this project and will exploit his product in the future. The generator of PRC project idea must expressly realize and clearly explain to the project manager the requirement in the project's product, adequately estimate its financial state and investment possibilities to formulate the project identification order. The project manager and generator of PRC project idea (more often he is the customer of the project and user of its product in future) conduct the conceptual negotiations on the project configuration, its purpose, and the ways of its achievement. The project manager conducts a preliminary technical and economic ground and multiple agreement of the preliminary configuration of PRC project with interested persons. For PRC project identification it is necessary to give the project manager some information:

- $V$  kinds and  $Q$  volumes of agricultural raw material grown in this ACE, which is the result of agricultural production;
- $S$  forecast specialization and  $W$  power of each small reprocessing enterprise, which will be included in PRC, which is the result of reprocessing production.

The result of every ACE agricultural production is the function of the following indexes:

$$V = f(K_T, P_S, F_G, A_g, G_z, R_S), \tag{1}$$

Where  $K_T$  - the traditional sowing of cultures in the economies of the region;  $P_S$  - an area of agricultural lands;  $F_G$  - physical and mechanical properties of soils;  $A_g$  - agri-technical properties of soils;  $G_z$  - configuration of fields;  $R_S$  - the demand on this raw material at the market.

$$Q = f(N_M, U_K, P_T, G_K, O_p, Z_P), \tag{2}$$

Where  $N_M$  - the quality of seminal material;  $U_K$  - the productivity of cultures;  $R_T$  - the productivity of animals;  $G_K$  - soils and climatic terms;  $O_p$  - the organization of mechanized processes in a crop-growing and husbandry;  $Z_p$  - the storage of raw material.

The efficiency of reprocessing production also depends on such factors:

$$S = f(C_p, C_s, W_p, Q_s), \quad (3)$$

Where  $C_p, C_s$  - a realized price, according to commodity products and its raw material;  $W_p$  - commodity products volumes of every SRE;  $Q_s$  - the amount of the grown raw material for the given commodity products.

$$W = f(V_p, B_p, T_p, K_p), \quad (4)$$

Where  $V_p$  - a commodity unit cost;  $B_p$  - the losses of products in raw material up to the moment of reprocessing;  $T_p$  - transport charges;  $K_p$  - capital investments on creation of SRE.

Consequently, each of the created PRC must have its own production programme activity (kinds and volumes): at first, grown agricultural raw material and, secondly, commodity products produced by such complex. On the other hand, the production programme of every SRE in the PRC structure depends on the kinds and amount of the grown raw material, and also on the demand for the commodity products produced by every SRE in the PRC structure. Making conclusions we consider that PRC will be effective enough in the case of coordination and cooperation of all the components of production structure. The growing of raw materials in PRC, on one hand, will satisfy the demand on the local market and on the other hand - will be downgraded to the group of small reprocessing enterprises.

Therefore, it is very important to scientifically establish, according to soil, climatic and socio-economic conditions, for each PRC: 1) the agricultural production programme; 2) the production programmes of each of SRE in PRC; 3) a flexible and effective interaction of growing, storage and reprocessing of PRC agricultural raw material.

That is why in modern economic conditions the agricultural production is considered as the interaction of three basic mechanized processes: plant growing, meat and milk production and the reprocessing of these types of raw material into the commodity products. Therefore, the primary purpose of PRC production is not just getting the agricultural raw material in maximally possible volumes but the production and realization of commodity products at the market.

Taking into account the stated theoretical opinions, we are planning to create the PRC project on the basis of the educational-scientific-experimental center (ESEC) of Lviv national agrarian university (LNAU).

The production and technological bases of ESEC are formed by:

- 1545 hectare of agricultural lands, including 560 hectare of plough-land;
- stock-raising-production complex comprising: 180 cattle-heads; 142 pig-heads;
- engineering and technical complex;
- tractor, truck and agricultural machine park involving: 10 tractors; 8 trucks; 4 combines harvesters; 3 forages combines; complex of agricultural machines.

After the accumulation of the basic data and the proper calculations according to the methods developed in the researches [5,8,10,14,16,17,21], the SRE optimum annual programmes were estimated according to the ESEC grown raw material production and the present socio-economic conditions can be included in the production and reprocessing complex (Table).

Table. SRE production programmes for PRC on the basis of ESEC of LNAU

SRE SREcialization	Annual power, tons
Mill:	400
flour	350
grain	50
Bakery:	85
bread	70
macaroni	15
Rape oil making enterprise	150
Milk reprocessing enterprise:	115
pasteurized milk, 2,5% adiposeness	80
sour cream, 15% adiposeness	35
Meat reprocessing enterprise:	32
can beef	8
ham	5
smoked sausages	7
semi smoked sausages	12

As the result of the conducted experimental researches we have grounded the specialization of five SRE: mill, bakery, rape oil making enterprise, milk and meat reprocessing enterprises. Consequently, except the present production base, the complex of small processing enterprises will be included in PRC:

- Mill: flour - 350 tons/year and grain - 50 tons/year;
- Bakery: bread - 70 tons/year and macaronis - 15 tons/year;
- Rape oil making enterprise: rape oil - 150 tons/year;
- Milk reprocessing enterprise: pasteurized milk - 80 tons/year and sour cream - 35 tons/year;
- Meat reprocessing enterprise: can beef - 8 tons/year, ham - 5 tons/year, smoked sausages - 7 tons/year, semi smoked sausages - 12 tons/year.

The organization process of PRC activity consists in the engineering and technical, organizational and technological providing of production, which is demonstrated in the next scheme (Fig.3).

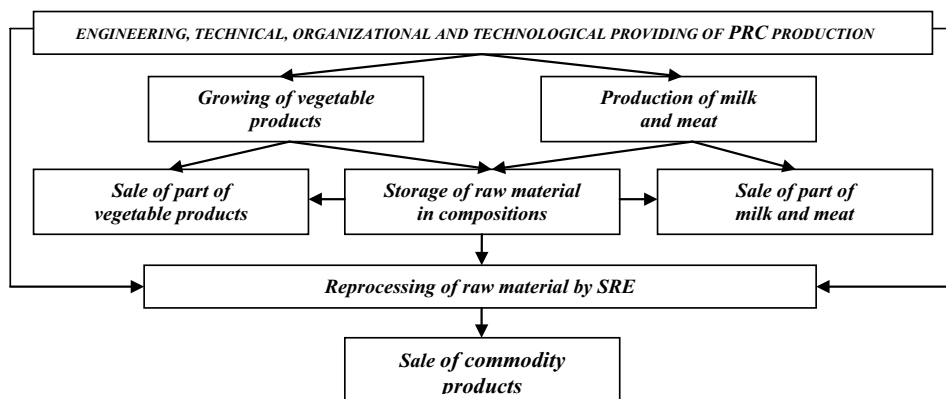


Fig. 3. Organization scheme of PRC activity on the ESEC LNAU production basis

The management of a production and processing complex has as the main purpose to provide the control over the production and effective co-operation of all the services and subsections. The scheme of PRC activity management is presented in Fig.4.

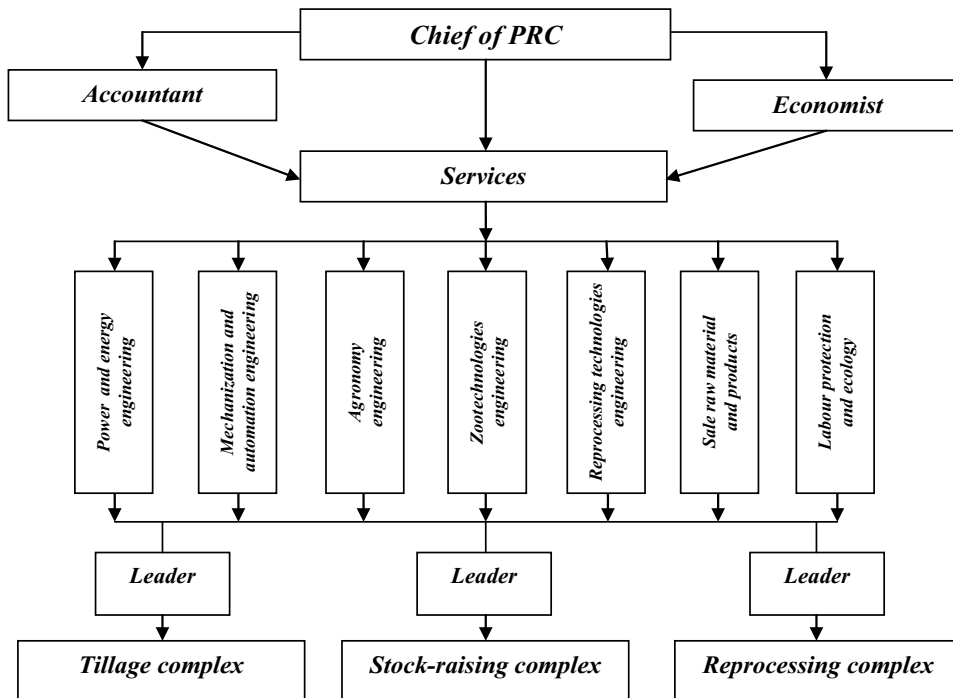


Fig. 4. Scheme of PRC activity management on the ESEC LNAU production basis

The director of production and processing complex heads the PRC management. There are two main SRE specialists - economist and accountant for providing the management with object planning and accounting.

There are three production complexes: tillage, stock-raising and reprocessing and seven specialized services: power and energy engineering, mechanization and automation engineering, agronomy engineering, zootechnics engineering, reprocessing technologies and technology of food production engineering, sale of raw material and commodity products, labour and environment protection. The complexes are managed by the specialists of proper industries and the services are managed by the main specialists.

The agronomical, engineering and technical services of PRC organize the mechanized processes of plant raw material growing. Zootechnics engineering and technical services of the production and processing complex have a task to organize milk and meat production in PRC. Reprocessing technologies, mechanization and automation, and power engineering services organize mechanized processes of raw material reprocessing.

The Chief of PRC is the main co-ordinator of the three mechanized processes: crop-growing, stock-raising and reprocessing industry complexes. The preliminary trained workers are responsible for the implementation of all the technological operations in three PRC departments. The leaders of the proper services organize and test their work keeping to the technologies and regimes, proper

technical exploitation of machines and equipment, control over the labour and ecological protection. The leaders of subsections organize and control the workers' activity. The sale of raw materials and commodity products is organized by sale service. The service of labour and environmental protection must provide the normative conditions of labour and ecology in PRC activity.

We have estimated the efficiency of the production and reprocessing complex activity which will be created on the production, economic, material and technical basis of ESEC of Lviv NAU. The results of the calculations prove that the introduction of PRC in the university ESEC will provide €120-150 thousand of annual profit.

## CONCLUSIONS

The development of projects for production and reprocessing complexes for growing and reprocessing of the ACE agricultural raw materials into commodity products at present will provide the agrarian enterprises with the additional financial funds for the increase of technical-technological and social-economic level of agricultural production.

We consider that the creation of PRC on the production basis of a new or operating ACE in the production and technological processes of modern agriculture is one of the effective methods of the removal of possible risks or minimizing the results of their influence, on one hand, and getting the additional profits after low capital investments and current expenses, on the other hand.

## REFERENCES

- Flys I.M. Main requirements to the innovative projects in the programs of the villages and their territories development / I.M.Flys // East-West Magazine of new technologies. – 2010. – 1/3(43) – p. 61-63.
- Flys I.M. Identification of projects value for rural territories / I.M.Flys // Theses of the VII International conference «The projects management in society development». Theme: Projects and programs management for organizations value development. – Account. for an issue prof. S.D.Bushuev. – K. : KNUBA, 2010 – p. 208-209.
- Flys I.M. Innovative projects identification and harmonization of project environment in the programmes of development of AIC / I.M.Flys // East-West Magazine of new technologies. – 2011. – 1/6(49) – p. 57-59.
- Flys I.M. An equipment choice for small reprocessing enterprise on the coefficients of ponderability basis / I.M.Flys, S.V.Syrotjuk // Announcer of Lviv State Agrar. Un-ty: Agroengineerings researches №4. – Lviv : Lviv State Agrar. Un-ty, 2000. – p.41-43.
- Flys I.M. **The Scientifically methodical grounding of specialization and power of reprocessing enterprise** / Ekology-ekonomical problems of development of AIC: Materials of International scientifically-practical conference, devoted 10th the anniversary of Conference of UNO on questions of guard of environment and development (t. Dublyany, September, 25-27 2002). – V.1. – Lviv : Lviv State Agrar. Un-ty, 2002. – p. 285-290.
- Sydorchuk O.V. The functional structure theory development of material production / O.V.Sydorchuk // Announcer of Lviv State Agrar. Un-ty: Agroengineerings researches №7. – Lviv : Lviv State Agrar. Un-ty, 2003. – p. 3-8.
- Sydorchuk O.V. A functional structure of reprocessing enterprises in their projects / O.V.Sydorchuk, I.M.Flys // Announcer of Lviv State Agrar. Un-ty: Agroengineerings researches №8. – Lviv : Lviv State Agrar. Un-ty, 2004. – p. 82-88.

- Flys I.M. Grounding of the reprocessing enterprise production programme / I.M.Flys // Announcer of Lviv State Agrar. Un-ty: Agroengineering researches №8. – Lviv : Lviv State Agrar. Un-ty, 2004. – p. 75-81.
- Flys I.M. Technological features of functional structure forming of reprocessing enterprises / I.M.Flys // Announcer of Lviv State Agrar. Un-ty: Agroengineering researches №9. – Lviv : Lviv State Agrar. Un-ty, 2004. – p.60-64.
- Flys I.M. **A management of the small processing enterprises production programmes in their projects** / I.M.Flys // Scientific messages of the International humanitarian university: Collection / Edited by prof. Rybak A.I. – Odessa : Intern. Humanit. Un-ty, 2009. – Iss. 16.- Series : «Projects and programs management». – p. 28-33.
- Flys I. Engineer project management by production and processing complexes / I. Flys // MOTROL-2010 . – Motorization and power industry in agriculture. – Tom 12. – Lublin, 2010. – p. 75-81.
- Flys I.M. Engineering providing of complexity of agricultural raw material reprocessing / I.M.Flys, J.V.Shymonjuk, O.G.Gordijuk // Announcer of Lviv State Agrar. Un-ty: Agroengineering researches №9. – Lviv : Lviv State Agrar. Un-ty, 2004. – p. 65-69.
- Sydorchuk O.V. A method of determination of harvest of agricultural cultures losses as a result of ill-timed implementation of the mechanized processes of field-crop cultivation / O.V.Sydorchuk, S.R.Senchuk, P.M.Lub, A.V.Tatomyr, A.V.Burylko // MOTROL-2005 . – Motorization and power industry in agriculture. – Vol. 7. - Odessa, 2005. – p. 87-91.
- Flys I.M. The reprocessing enterprises programmes management in their projects / I.M.Flys // The agroindustrial engineering in measurings of thrift / Edited by prof. O.D.Semkovich, O.V.Sydorchuk, I.M.Flys, S.J.Kovalyshyn. – Lviv : Lviv State Agrar. Un-ty, 2006. – 318 p.
- Flys I.M. The projects Development of the complex reprocessing of agricultural raw material in economies // Announcer of agrarian science . – K. – 2006. – Special issue, August. – p.121-125.
- Flys I.M. The production programme management of small reprocessing enterprise in its project / Theses of International conference // Projects management in society development. – Theme: The organization development programmes management in competition surroundings: Materials of the IV International conference. – K. : KNUBA, 2007. – p.153-155.
- Flys I., Kupriyenko M. The engineering management of complex processing of agricultural raw materials in economies / The 31<sup>st</sup> Presentation of Scientific Papers conference at the University in Novi Sad, 19-20.11.2007. – p. 134-139.
- Tatomyr A.V. A configuration management in theprojects / A.V.Tatomyr, R.E.Krygul, M.M. Babich // MOTROL-2007. – Motorization and power industry in agriculture. – Volume 9a. – Lublin, 2007. – p. 89-94.
- Flys I.M. **Methodology of projects identification of production and reprocessing complexes** / Theses of International conference of // Management projects are in development of society. – Theme: A professional projects management is a way to the increase of assets of organizations: Materials of the V International conference. – K.: KNUBA, 2008. – p. 210-212.
- Flys I.M. Project identification of production and reprocessing complex / Announcer of Lviv National Agrar. Un-ty: Agroengineering researches №12. - Vol. 1. – Lviv : Lviv Nation. Agrar. Un-ty, 2008.– p.46-50.
- Flys I.M. The calculation of the production programme of processing enterprise // Engineering of agroindustrial production: Scientists of mechanics and power energy faculty for the production: Collective monograph. – Vip. 2 / by editor V.V.Snitinskij. – Lviv : Lviv Nation. Agrar. Un-ty, 2008.– p.75-76.



- Sydorchuk O., Sydorchuk L., Tatomyr A. Grounding of the main tasks the project management of power supply for rural power consumers / MOTROL-2008 // Motorization and power industry in agriculture. – Volume 10. – Lublin, 2008. – p. 122-125.
- Flys I.M. Development of the projects of the complex reprocessing of agricultural raw material in economies // Scientific messages of the International humanitarian university: Collection / Edited by prof. Rybak A.I. – Odessa : Intern. Humanit. Un-ty, 2008. – Iss. 10. – p. 92-95.
- Flys I.M. The grounding of mill production programme for agricultural enterprise / I.M.Flys, M.J.Kuprijenko, M.I.Kozhushko // Konferencja Miedzynarodowa. “Problemy inzynierii rolniczej i lesnej”. – Szkoła Główna Gospodarstwa Wiejskiego w Warszawie. – Warszawa, 4-5 czerwca 2008. – Warszawa, 2008. – p. 111-115.
- Flys I.M. Theoretical grounding of production and reprocessing complex projects / Theses of international conference // Thesis lectures of VI International conference «A management projects in development of society». – Theme: An acceleration of development of organization is on the basis of project management – Account. for an issue prof. S.D.Bushuev. – K. : KNUBA, 2009. – p. 197-199.

#### НАУЧНО-ПРАКТИЧЕСКИЕ АСПЕКТЫ УПРАВЛЕНИЯ ПРОЕКТАМИ ПРОИЗВОДСТВЕННО-ПЕРЕРАБАТЫВАЮЩИХ КОМПЛЕКСОВ

**Аннотация.** Рассмотрены научно-практические аспекты управления проектами производственно-перерабатывающих комплексов, которые создаются на базе новых или действующих сельскохозяйственных предприятий. Внедрение проекта производственно-перерабатывающего комплекса обеспечит получение дополнительных финансовых средств сельскохозяйственному предприятию для повышения технико-технологического уровня производства.

**Ключевые слова:** проект, управление проектами, сельскохозяйственное предприятие, малое перерабатывающее предприятие, производственно-перерабатывающий комплекс.