

**MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
DROHOBYCH IVAN FRANKO STATE PEDAGOGICAL UNIVERSITY
LVIV POLYTECHNIC NATIONAL UNIVERSITY**

**INNOVATION PROCESS MANAGEMENT IN UKRAINE:
PROBLEMS IN COMMERCIALIZATION OF SCIENTIFIC AND
TECHNICAL DEVELOPMENTS**

MONOGRAPH

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**Lviv
Rastr-7
2018**

UDC 330.341.1

Y 677

Recommended for publication by the Academic Council of the Drohobych Ivan Franko State Pedagogical University (Protocol N 9 dated June 21, 2018)

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Y 677 **Innovation Process Management in Ukraine: problems in commercialization of scientific and technical developments : Monograph / Yuri Vovk, Oleh Karyy, Ihor Kulynsk, Yosyf Petrovych, and other / Edited by Yuri Vovk, Oleh Karyy. – Lviv : LLC «Rastr-7», 2018. – 266 p.**

ISBN 978-617-7726-00-4

The monograph examines the problems in commercialization of scientific and technical developments of innovation process management in Ukraine.

The monograph uses the results of research work of the Department of Management of Organizations of Lviv Polytechnic National University – «Evaluation mechanism and efficiency improvement of innovation processes» (State Registration Number 0117U004469).

The monograph is intended for scientists, graduate students, entrepreneurs, managers, economists and all those who are interested in the problems in commercialization of scientific and technical developments of innovation process management in Ukraine.

UDC 330.341.1

*The materials of the collective monograph are given in the author's wording.
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ISBN 978-617-7726-00-4

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2.2. Analysis of contemporary ecologization problems use of transport land

The realities of the twenty-first century characterize the present anthropogenic activity as a way of generating profit, which at the same time ought not to be too costly in monetary terms. This fact means that entrepreneurs and manufacturers are ready to consume and exhaust natural resources without damages and measures to protect them.

Sustainable economic development of the world community is impossible without solving environmental problems, and if political or economic interests have conflict with environmental ones, preserving the integrity of the ecosystem ought to dominate.

Transport is one of the most important infrastructural branches of material production, which ensures the production and non-productive needs of the national economy and the population in all types of transportation. The transport system is one of the basic branches of the economy, the stable functioning of which provides the necessary conditions for defense, national security, the integrity of the state, and raising the living standard of the population.

Today, the transport sector of Ukraine is a significant and important segment for the country's economy, because efficient and coordinated work of the whole transport system is a moving force for the overall development of the country. The development of integration processes and the growth of the market competitiveness of transport services requires new approaches to the development of transport relations and the creation of new technologies and the improvement of service quality.

The development and issue of the formation of the mechanism of ecologically safe use of land transport and issues of environmental impacts are considered in the scientific works of I. Bistryakova, V. Golyana, S. Ibatullina, A. Martin, I. Novakovskaya, A. Sokhnycha, M. Stephenya, M. Khvesika., D. Dobryaka, O. Budzyak, N. Bondarchuk, I. Zaporozhets, V. Boychenko, V. Boychuk, F. Goncharenko, I. Yevgenyev, D. Prusenko, V. Skorchenko, A. Slavutsky, N. Solenkov, N. Ornatsky, Y. Khomyaka and others. However, a critical analysis of literary sources has shown that many issues that determine the development of an ecologically safe land use system are not legally regulated. Problems, risks and risks in this area, which affect the level of its efficiency, are also unresolved, and measures are being taken to continually restore soil fertility, protect land from degradation, and so on. Therefore, the study of the effectiveness of ecologically safe land use in Ukraine will have a significant scientific and practical significance [7].

The main purpose of research is the substantiation the concept of modern problems of ecologically safe use of transport lands and determination of the main mechanisms of implementation and development of the ecologization system.

At the present stage, the integration of domestic transport infrastructure into the European one, which creates conditions for the progressive country development, strengthening the economic security of the state, increasing the competitiveness of the transport network to increase transit traffic and tourism development. Therefore, the necessary attention should be paid to comprehensive measures to eliminate the harmful effects of vehicles on the environment, in particular on human livelihoods [13].

There are the main facts about the influence of harmful substances on human health as a result of the operation of any transport modes:

- pollution of the atmosphere with the formation of acid rain, highly poisonous and destructive substances as a result of secondary chemical reactions, including photochemicals;
- climate change in the Earth on the basis of increasing the greenhouse effect, methane emissions and other low-concentration gases, aerosols, light radioactive gases, changes in the concentration of ozone in the troposphere and stratosphere;
- pollution of the ocean, burial of toxic and radioactive substances in it, saturation of its water with carbon dioxide from the atmosphere, exposure to anthropogenic petroleum products, heavy metals and complex organic compounds, acidification of shallow water due to pollution of SO_x and NO_x in the atmosphere, breaking of normal environmental bonds between the ocean and the waters of the land due to the construction of dams on the rivers;
- prolonged accumulation of poisonous and radioactive substances, household rubbish and industrial wastes on the surface of the earth, practically not decomposable and very stable, such as polyethylene products, other plastics;
- deterioration of the living environment in cities and rural areas, increased noise exposure, air pollution by industry, vehicles, human visual impairment of high buildings, tensions in urban life and the loss of social ties between people;
- absolute overpopulation of the Earth and relative demographic recession in its individual regions;
- reduction of the area of tropical and northern forests, which leads to an imbalance of oxygen and an increase in the disappearance of species of animals and plants;
- formation of ecological niches during the above-mentioned process and filling them with pests, parasites, pathogens of new diseases of plants and animals, including humans [11].

Non-compliance with environmental safety requirements leads to the emergence of new incurable diseases and the possible reduction of human populations. The mechanism of regulation of these populations may become epidemics. In nature, this is a habitual process that relates to environmental factors that depend on population density. Naturally, there must be new, still non-existent diseases, such as "illness of the legionnaires" (it is the bacterial infection, which is

characterized by severe pneumonia, severe intoxication, as well as disorders of the central nervous system and kidneys).

To compare the effects of harmful substances, authors have considered the most common and popular types of transport: automobile and aviation.

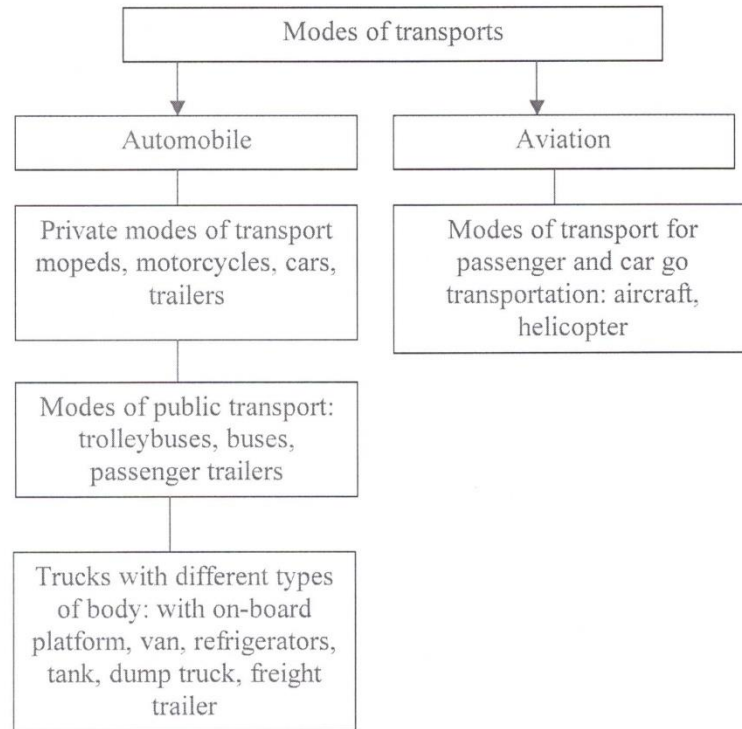


Figure 1. Varieties of modes transport in the aviation and automobile transport systems [21]

So why, nonetheless, do the international community choose automobile and aviation transport services? Information in Table 1 shows the advantages and disadvantages of their work.

Consequently, the main advantage of aviation mode of transport is the speed of transportation and accessibility to distant corners of the world, in contrast to road transport. For example: automobile transportation at a distance of 1,700 km takes 1 day, while the aviation transportation at a distance of 13,000 km takes again about 1 day.

In turn, the advantages of road transport are high maneuverability, mobility and regularity of transportation and small capital investments compared to costly financially aviation transport.

Table 1

Comparative analysis of the advantages and disadvantages of using automobile and aviation modes

N	Mode of transport	Advantages	Disadvantages
1.	Automobile	High maneuverability and mobility; <ul style="list-style-type: none"> • Ability to ensure regular delivery; • Delivery of products without intermediate congestion and directly from the consignor to the consignees; • Less stringent requirements for product packaging; • Small capital investments in the development of small cargo turnover for short distances 	Relatively high transportation costs; Emergency state of the Ukrainian road network; Urgency of unloading (high cost of downtime); Dangerous effect from emissions of harmful substances into the environment
2.	Aviation	The speed of delivery of goods; Shortages in comparison with other modes of transport; Ability to reach distant and hard-to-reach areas	The speed of delivery of goods; Short routes compared to other modes of transport; Ability to reach distant and hard-to-reach areas

At this stage scientific and technological progress, which got the unprecedented and huge scale today, and characterized by the continuous creation of new and improved existing technologies and modes of production, the aviation and automobile industries in turn, are the realization of new achievements and success in the practical aspect of application. There are the development of new ground and airborne equipment; creation of powerful engines; fleet and vehicle fleet renewal, also designing new modes of transport. But along with such positive achievements at the first glance, aviation and automobile transport remain a large source of harmful factors for the environment, the first of which is usually in the vicinity of large cities, and the latter, in turn, within large cities. Therefore, the current situation leads to the need to develop and implement a comprehensive program of environmental safety in air transport activities [12].

Consequently, now it is very important to study and research the existing problem, which depends with implementation of the functioning mechanism and development of the ecologization system. So, let's first look at what are the most ecologically dangerous factors from the operation of aircraft and ground vehicles

that have a direct impact on the environment, including the vital functions of living organisms, human health, and what harmful effects might be observed as a result of such influence.

Table 2

Ecologically dangerous factors at work of aviation and motor vehicles having an impact on the environment

N	Factors	Consequences
Aviation modes of transport		
1.	Emission	Respiratory disease (human) Toxic symptoms (human, animal, other living organisms) Discomfort in the normal development and functioning of living organisms
2.	Emissions of combustion gases	Global warming Changes in climatic characteristics of different regions
3.	Environmental condition within and outside the airport	Contamination of the surrounding territories of the land fund and the environment in as a whole
Automobile modes of transport		
4	Emissions (CO ₂ (carbon dioxide) C (soot), C _m H _n NO _x)	Violation of soil cover, roadside pollution, respiratory diseases, oncology, life expectancy reduction

Pollution by the transport of the environment happens in consequence to emissions into the atmosphere of products of fuel combustion, weathering of bulk cargoes during transportation, evaporation of petroleum products, etc. Thus, when transporting oil cargo by rail, the amount of carbohydrate compounds entering the atmosphere is twice that of cars [3].

As a result, of the process of combustion of fuel is the formation of new environmental-dangerous, gaseous, liquid and solid substances, which are derivatives from chemical elements, combinations and formations contained in the original fuel, as well as in the composition of the original fuel, and already as a result in the composition atmospheric air entering the combustion. Chemical elements that combine fuel and air substances interact with each other, and undergo a certain thermal treatment, turn into emissions of combustion products into the environment.

Table 3

Harmful emission of automobile transport mode

[According to the researchers of the Chemotology Center of the National Aviation University]

Kind of engine	Waste gas, %			Crankcase gases, %			Fuel evaporation, %		
	CO	CH	NO _x	CO	CH	NO _x	CO	CH	NO _x
Benzine	95	55	98	5	5	2	0	40	0
Diesel	98	90	98	2	2	2	0	8	0

Fuel pairs are harmful and poisonous. Their accumulation in the air and on the surface layer of the soil is a danger to humans and the environment, and it can lead to fires.

But still the greatest dangers in this case are:

- changes in the physical, chemical and biological characteristics of the ecosystem;
- violation of the course of natural biological processes;
- the formation of microbiological cleavage resistant even more toxic compounds that contain carcinogenic and mutagenic qualities [3].

There are spills, sewage and emissions, which are the main sources of soil pollution by hydrocarbons. The penetration of such harmful substances into the soil leads to an active change in the chemical composition and soil structure. It is impossible not to notice that in the first turn such influence is reflected on the humus horizon, that is, with the increase the amount of hydrocarbons in it, the quality of the soil sharply deteriorates as a nutrient substrate for plants. Consequently, contamination of soil with hydrocarbons of oil and petroleum products leads to a sharp violation of soil microbiocenosis, and a long-term negative effect on soil animals, causing elimination in the intensive pollution zone.

Table 4

Degrees of soil pollution by oil products [According to the researchers of the Chemotology Center of the National Aviation University]

N	Degrees of pollution	Value, mg/kg
1	Non-Subsurface Resources	Before 400
2	Slack	3000-6000
3	Medium	6000-12000
4	Strong	12000-25000
5	Strongest	<25000

Table 2 clearly shows that for the back soils, which are concentrated in the center of Ukraine in most cases, the lower limit of weak pollution of hydrocarbons is 3000 mg / kg, which is considered like a relatively acceptable level. At the same time, special measures are required to rehabilitate soils that are contaminated above the permissible level, which is 10,000 mg / kg [6, p. 373].

In some cities, the specific gravity due to vehicle contamination in general contamination exceeds 50%. As a result more than 200 dangerous toxic substances form. These substances include carbon monoxide, sulfur, nitrogen, lead and its compounds, soot, polycyclic aromatic hydrocarbons complex (SAWs)) and separately benz (a) pyrene. Exhaust gases, products of wear of mechanical parts and tires of vehicles, as well as road cover, account for about half of the atmospheric emissions of anthropogenic origin. In accordance with the differences in the quantities and types of pollutant emissions it is expedient to consider separate internal combustion engines (especially two-and four-stroke) and diesel engines.

Table 5

Influence of exhaust gases of cars on human health [16]

Harmful substances	Consequences of impact to the human body
Carbon monoxide	This substance prevents the absorption of oxygen by blood, which weakens mental faculties, affects reflexes, causes drowsiness and may cause loss of consciousness and death.
Lead	This substance influences on the circulatory, nervous and genitourinary system and causes decrease of mental abilities in children, deposited in bones and other tissues, therefore dangerous during the day
Nitrogen oxides	These substances might increase the body's ability to viral diseases (such as flu), irritate the lungs, and cause bronchitis and pneumonia
Ozone	This substance irritates the mucous membrane of the respiratory system, causes coughing, asthma, bronchitis, disrupts the lungs, reduces resistance to colds, and also might exacerbate chronic illness, causes
Toxic emissions (heavy metals)	These substances cause cancer, break function of the reproductive system and defects in infants
Toxicity of air pollutants for plants	
Dioxide of substances	It is the main pollutant and a poison for assimilation organs of plants, which operates at a distance of up to 30 km
Fluoride hydrogen and tetrafluoride silicon	These substances are toxic even in small quantities, prone to the formation of aerosols, operate at a distance of up to 5 km
Chlorine, hydrogen chloride	These substances prevent mostly at a close distance
Lead compounds, hydrocarbons, carbon monoxide, nitrogen oxides	These substances infect plants in areas of high concentration of industry and transport
Hydrogen sulfide	It is cell and enzyme poisons
Ammonia	It prevents plants mostly at a close distance

effects of technogenic and economic activity.

It ought to be noted that environmental and economic activities include the introduction of new technologies for resource conservation, rational use of existing resources, use in the production process of solid waste production, replacement of materials for new ones - environmentally safe.

Such ways of ecological safety are related to the implementation of innovative developments, their experimental implementation and subsequent use in production, and ensure the environmentally sound use of land resources. In turn, it requires significant funding and development of a relevant strategy. Organizational and managerial issues of structural adjustment of the aircraft industry and automobile engineering, technical exploitation of fixed assets, transport modes servicing, especially after sales were not considered in the conditions of the administrative-command system of management. Efficiency of operation and repair at different levels of subordination of these enterprises were not raised or resolved, let alone already about the possibility of their attribution to various forms of ownership.

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