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Assessing Innovation in Water Supply, Sewage, and Wastewater Treatment Enterprises

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Abstract:

Purpose: *The working out an integral indicator of innovative development of water supply and sewage industry enterprises, taking into account the environmental and social component of the analyzed enterprises, based on the calculation of the integral index.*
Design/Methodology/Approach: *The study employs an approach to estimation the innovative development of the analyzed enterprises, which consists цm identifying 6 generalizing indicators of innovative development and selecting partial indicators for them.*
Findings: *Evaluation of innovative development using an integral indicator is important for potential investors. The result of such an evaluation can significantly influence both the formation of the enterprise's value and the decision regarding the feasibility of its acquisition. The use by authorities of the innovative development's integral indicator of the companies will provide an opportunity to analyze innovative activity at the level of the enterprise, industry, region, river basin, clusters and the country as a whole. Such an analysis is necessary for understanding, substantiation and decision-making regarding the financing of innovative measures aimed at protecting the environment from the budget funds.*
Practical Implications: *the evaluation of the innovative development of water and sewage enterprises using the proposed approach emphasizes the importance of the ecological and social component of the development of the analyzed enterprises in the context of the concept of sustainable developmentő taking into account the specifics of their activity.*
Originality/Value: *This study provides the working outt of an integral indicator of innovative development of enterprises, which takes into account all components of economic activity and gives significant importance to the environmental and social activities of water supply and sewage industry enterprises.*

Keywords: *Innovation development; estimation; social and environmental components, integral indicator; water supply, sewage and wastewater treatment enterprises.*

JEL codes: *O30, L9, O18.*

Paper Type: *Research article.*

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1. Introduction

Water supply, sewage and wastewater treatment companies while they provide vital services for consumers and businesses are among the most significant components of the socio-economic systems of every countries. For most of the enterprises under investigation, the low efficiency of activities is associated, primarily with a protracted innovation pause.

The urgent need for outdated fixed assets modernization, the need for technical re-equipment based on the use of domestic and foreign scientific and technical developments, in particular, in energy and resource conservation spheres, the introduction of environmentally friendly technologies all those factors are considered in terms of intensifying enterprises' innovation development.

One of the directions for accelerating the enterprises' innovation development is to improve the management of their innovative activity by introducing an adequate methodology for assessing the level of such development.

2. An Overview of the Literature

In the academic circles and among economists-practitioners, the theme of innovation development of the state, whole economy branches and individual enterprises is being discussed more and more often. The stakeholders affront a number of disturbing rhetorical questions without answers such as: what is an acceptable level of innovation development? Is it happening at all? what are the indicators to measure it? Is innovation development taking place when innovative measures have led to an increasingly negative impact on the environment?

Among the scholars who studied the problems of innovation development evaluation, we highlighted a number of studies by Heyetsya and Semenozhenka (2006), Malyuty (2011), Illyashenka (2013), Karyuka (2012), Kuzhdy (2008), Chervan′ova (1999), Neykovoyi (1990), Yastrems′koyi and Blyznyuk (2008), Prokhorovoyi and Mushnykova (2014), Lapko (2005).

Their works were devoted to assessing the innovation level in the spheres of engineering, energy, construction, agriculture and other basic industries. The question of innovation activity evaluation in terms of enterprises that provide services in the field of water supply, sewage and wastewater treatment remains insufficiently investigated.

Scientific publications often refer to rating systems and indexes, which allow scientists and economists to determine the current state and level of innovation development. Dynamics of any management subjects' innovative development is largely determined by the properties of its individual structural components.

Therefore, the definition of such structural components at the enterprises is carried out in order to study the impact of innovations on each of them, identifying the reserves for activating certain internal processes occurring in various innovation activity functional components.

Typically, researchers analyze a number of innovation components: industrial, technical, technological, resource, productive. Regardless of the natural resources importance, both for economic development of the country and for the individual enterprise, as well as for social well-being and public health, most of the existing assessing methodics do not take environmental and social components into account.

3. Research Methods

The purpose of the research is to develop and substantiate a methodical approach to the assessment of the innovation development level, taking into account not only the technical, technological, economic, but also social and environmental components of their activities by means of defining the structural components of the enterprises providing services in the field of water supply, sewage and wastewater treatment.

4. Results

The activities of the water supply and wastewater companies in Europe have their own distinctive features distinguishing them from enterprises of other sectors of the economy.

Water supply and wastewater companies' activity is characterized by an extraordinary social significance, because they provide physiological needs of the dominant majority of society members. The quality of their services influences not only such social indicators as quality of life, public health, but also the purchasing power of the population, social tension, general social progress etc. Therefore, assessing the level of innovation development, it is necessary to take into account the social component of activity.

It is also necessary to draw attention to the fact that the activity of the enterprises providing services in the field of water supply, sewage and wastewater treatment directly influences the sustainable development of society due to the high degree of environmental activity: on the one hand, there is a potential danger of the natural disasters negative impact on the activities of the highlighted enterprises and on the other – there is a risk of negative impact of those enterprises on the environment due to the discharge of crude and insufficiently treated wastewater into the natural reservoirs.

Since water resources are the determining factor in the activity of water supply, sewage and wastewater treatment enterprises, and the state of water resources reflects the results of the mentioned entities operations impact on the environment, it

is extremely important to include an environmental component for assessing the innovation development level.

The characteristic difference of the proposed approach from the existing ones is the introduction of an institutional component for evaluation in order to take into account the institutional features of public administration in the sphere of water supply and sewage in Eastern Europe countries. This component reflects the impact of state institutions on the level of income of enterprises, in particular the degree of reimbursement by state and local budgets of subsidies, benefits and subsidies to the population to cover the difference in tariffs.

Consequently, we propose to include social, ecological and institutional components in the list of classical (generally accepted) components of the economic entities activities that directly characterize innovation development and adequately reflect the results of business processes.

Under the innovative development of enterprises that provide services in the field of water supply, sewage and wastewater treatment in Eastern Europe countries, one should understand the process of quantitative and qualitative changes in the productive forces and economic relations by introducing and implementing innovative technologies, investment projects and programs that will allow those institutions to obtain a positive economic effect, improve the ecological situation and social indicators of the society development.

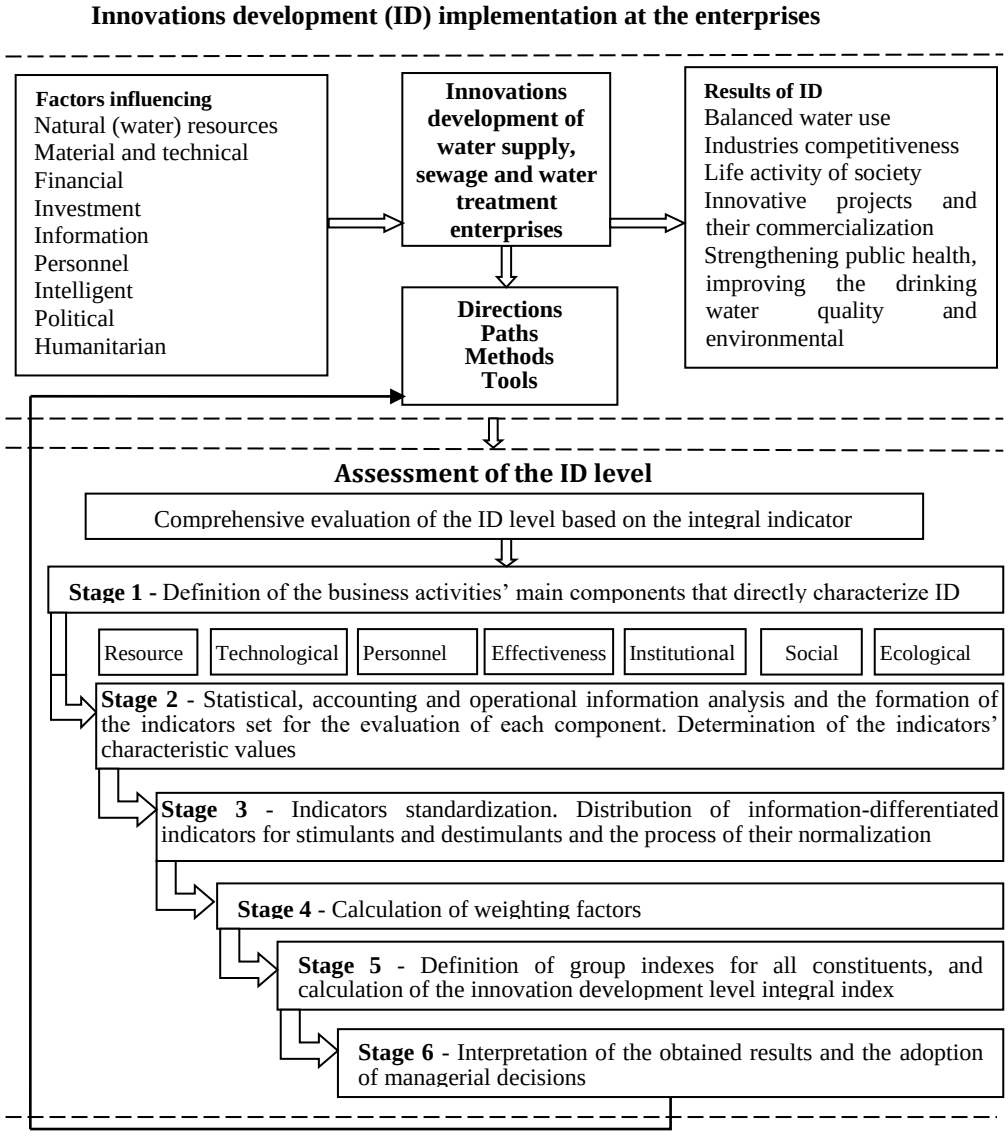
In our opinion, the scientific understanding of the innovation development level implies the ability to measure it with quantitative characteristics. Since the data of statistical observations (although complex and taking into account ecological and social orientation of activities) does not reflect the innovation development level of enterprises that provide services in the field of water supply, sewage and wastewater treatment, it is obvious that the development of such assessment methods that will enable accurately, comprehensively and at the same time relatively easy record of current state and change trends is vital.

It is about calculating such a universal indicator that would allow to comprehensively take into account the main aspects of the enterprises activity and at the same time assess the level of their innovation development. The elaboration of such indicator can be based on the theory of "additive value", according to which the value of the whole equals the sum of its components values. Therefore, theory implies the possibility of quantifying the properties of complex economic, social and environmental phenomena and processes using a single number (Mochernyj, 2000).

The proposed approach to determining the innovation development level in the water supply, sewage and wastewater treatment enterprises will substantiate the calculation of the integral innovation development index, consisting of a group of subindices, each of which characterizes a certain activity component.

Thus, the integral innovation development indicator should be understood as the result of the most important innovation activity areas evaluation, based on the definition of aggregate indicators by applying a partial characteristics system and expert-statistical methods (Chorna, 2012). Figure 1 represents the integral indicator based complex evaluation model of water supply and wastewater treatment enterprises' innovations development in Eastern Europe countries.

Figure 1. *Innovations development integrated assessment model for the water supply and wastewater treatment enterprises in Europe*



Source: *Author's development.*

Implementation of the approach proposed by the authors involves six stages. At the first stage, the main components of the business entities are determined. As can be seen from Fig. 1, the main interconnected structural components of the water supply and wastewater treatment enterprises functioning considered from the perspective of innovation development, are:

- a production component that characterizes the impact of innovations on the state of fixed assets, enterprise activity efficiency in terms of providing water and wastewater treatment services to consumers;
- a technological component demonstrating the efficiency of innovative technologies that are used in providing water and wastewater services;
- a personnel component that shows the availability, composition and efficiency of the enterprises' labor and intellectual potential engagement;
- a resultive component, which involves calculation of innovation and investment activity efficiency indicators;
- an institutional component that reflects the degree of subsidies and privileges (granted to the consumers) reimbursement by the state, local budgets and grants;
- a social component that shows the impact of innovation activity on the quality and timeliness of the services provided, the state of public health;
- an ecological component that characterizes the burden on the environment in general and water resources in particular.

On the second stage, the choice of a indicators set to characterize each of the mentioned enterprise activity components is carried out. Such a list of indicators is formed on the basis of the indicators selection that most fully characterize each subindex based on the principles of representativeness, reliability and information accessibility.

To determine the innovative development subindices (general indicators) for such innovation activity components as resource, techno-technological, personnel and resultive the indicators were selected based on the use of existing studies in the field of evaluation methodology. And for the characteristics of the ecological, social and institutional components, we propose to apply the indicators given in Table 1.

Table 1. *Indicators for assessing enterprises' innovation development***.**

№	The name of the generalization indicator	Partial Indicators
1	Resource component	The share of developed innovative technologies
		Indicator of personnel and intellectual potential
		Fixed assets fund
		Fixed assets deterioration coefficient
		Fixed assets renewal Ratio
		Return on assets
		Cost-effectiveness of fixed assets
		Powerfulness
		Own capital concentration factor
		The coefficient of financial dependence
		Coefficient of the provision of working capital with own working capital
		Current liquidity ratio
		Cost-effectiveness of services provided
2	Technical and technological component	The rate of information resources use
		The level of losses and unrecognized water spending during its transportation to consumers, in% to general water supply in the network
		Information productivity coefficient
3	Personnel component	The ratio of personnel with higher education
		The ratio of staff training
		Productivity under innovations
4	Effective component	Innovation activity efficiency coefficient of the enterprise
		Innovation activity efficiency coefficient (recommended)
5	*Institutional component (recommended)*	*The amount of subsidies granted to the enterprise*
		The amount of special benefits reimbursement
		Budget grants to compensate for the difference in price
6	*Social component (recommended)*	*Indicator of the oncological neoplasms diseases spread*
		Indicator of parasitic and infectious diseases spread
		Indicator of the digestive system diseases spread
	The ecological component (recommended)	*Cases of centralized water supply (sources) drinking water samples inconsistencies with sanitary-chemical indicators*
		Cases of centralized water supply (network) drinking water samples inconsistencies with sanitary-chemical indicators
		Cases of centralized water supply (sources) drinking water samples inconsistencies with microbiological indicators
		Cases of centralized water supply (network) drinking water samples inconsistencies with microbiological indicators
		Indicator of the contaminated water (without purification) ratio to the total volume of return water
		Indicator of the insufficiently treated return water volume ratio to the total volume of return water
		Indicator of the normative return water volumes ratio to the total volume of return water
		Proportion of water that has undergone water preparation before being supplied to the network

Source: *The author's development is printed in italics.*

Each of the proposed components (generalizing indicators) of innovation development during the innovations implementation forms its own results (partial indicators), which are necessary to determine the indicators characterizing the enterprises' innovation development level. Each specified enterprise's activity type covers a certain set of partial (local) characteristics, which are combined grounding on most significant features taking into account the influence of each indicator on the evaluation of each proposed innovation development components (Kal'chenko, 2012).

The third stage of the innovation development level assessment involves the standardization of indicators. Since all the indicators we recommend for the enterprises innovative development assessment have different dimensions in terms of their components, therefore, they should be brought to a comparable condition and it will be expedient to carry out the process of their normalization (Yerina, 2001).

At the fourth stage of the evaluation, the calculation of the weighting factors of the partial indices and their groups is carried out. Since the suggested by authors generalizing components and partial indices have a disparate influence on the integral innovation development indicator it is necessary to take into account the degree of influence of the mentioned indicators or the specified component. Due to the difficulty, and in some cases inability to determine the normative values of partial indicators for assessing the enterprises innovation development, scientists most often use expert method in their research, as this method is effective for the evaluation of relatively important but different business subjects activities.

Thus, the next step for determining the innovation development integral indicator is the calculation of the weighting coefficients for partial indicators on the basis of the expert estimation method by means of indicators pairwise comparison. Using the method of pairwise comparison, qualitative estimates of one indicator's benefits over the other are converted into quantitative scores based on the elaborated marking scale. Basing on the experts survey results, the matrices of comparisons (so-called normalized matrices) are constructed.

The next step in assessing the enterprises' innovation development level is the experts questionnaire (based on content analysis) on the indicators weighting coefficients. To obtain scientifically substantiated results of expert evaluation of weighting factors, it is necessary to involve at least 5 experts, who should be the leading specialists in the sphere of housing and communal services in general and in the sphere of water supply and wastewater treatment in particular. After the experts have determined the importance of the enterprises' innovation development level indicators, we construct matrices for comparing the weighting coefficients for partial indicators as well as for generalizing indicators.

The generalized indicators for each of the integral indicator components offered by the authors for assessing innovation development are calculated according to the formulas given in Table 2.

Table 2. *Calculation of general indicators of innovative development of water supply and wastewater treatment enterprises*

№	Generalized indicators naming	Calculation of general indicators of innovative development
1	2	3
1	Production component generalized index $I_{PRODUCTION\ COMPONENT}$	$I_{PRODUCTION\ COMPONENT} = Cip * a_1 + C_{CS} * a_2 + C_{AD} * a_3 + C_{renew} * a_4 + C_{CP} * a_5 + C_{PFA} * a_6 + C_{conc} * a_7 + C_{FIN\ D} * a_8 + C_{work\ c} * a_9 + C_{c\ liq} * a_{10} + C_{return\ of\ services} * a_{11}$ where C_{IP} – indicator of the intellectual potential use; C_{CS} – indicator of the capital stock availability for the staff of the enterprise; C_{AD} – fixed assets depreciation factor; C_{RENEW} – fixed asset renewal factor; C_{CP} – index of fixed assets capital productivity; C_{PFA} – enterprise's fixed assets profitability coefficient; C_{CONC} – equity capital concentration coefficient; $C_{FIN\ D}$ – financial dependence coefficient; $C_{WORK\ C}$ – working capital ratio to own working capital; $C_{c\ liq}$ – current liquidity ratio; $C_{return\ of\ services}$ – rate of return on services; $a_1, a_2, a_3, a_4, a_5, a_6, a_7, a_8, a_9, a_{10}, a_{11}$ – respectively, the coefficients of partial indicators importance in terms of integral index resource component; $\sum_{i=1}^{11} a_i = 1$.
2	Technological component joint index $I_{TECHOLOGICAL\ COMPONENT\ JOINT}$	$I_{TECHOLOGICAL\ COMPONENT\ JOINT} = S_{INNOVATIVE\ TECHNOLOGIES} * a_{12} + C_{INFORMATION\ RESOURSES\ UTILIZATION} * a_{13} + C_{ENERGY\ EFFICIENCY} * a_{14} + S_{LEVEL\ OF\ LOSSES\ AND\ UNACCOUNTED\ WATER\ COSTS} * a_{15} + C_{INFORMATION\ PRODUKTIVITY} * a_{16}$ where $S_{INNOVATIVE\ TECHNOLOGIES}$ – the share of developed innovative technologies; $C_{INFORMATION\ RESOURSES\ UTILIZATION}$ – information resources utilization in the context of information technology implementation; $C_{ENERGY\ EFFICIENCY}$ – indicator of provided services energy efficiency; $S_{LEVEL\ OF\ LOSSES\ AND\ UNACCOUNTED\ WATER\ COSTS}$ – the level of losses and unaccounted water costs during its transportation to consumers,%; $C_{INFORMATION\ PRODUKTIVITY}$ – information productivity coefficient in terms of innovative technologies implementation; $a_{12}, a_{13}, a_{14}, a_{15}, a_{16}$ – respectively, the coefficients of partial indicators importance in terms of integral index' technological component; $\sum_{i=1}^{5} a_i = 1$.

1	2	3
3	Personnel component joint index $I_{PERSONNEL\ COMPONENT\ JOINT}$	$I_{PERSONNEL\ COMPONENT\ JOINT} = C_{HIGHER\ EDUCATION} * a_{17} + C_{PROFESSIONAL\ GROWTH} * a_{18} + P_{INNOVATIVE\ TECHNOLOGIES\ INTRODUCTION} * a_{19}$ where $C_{HIGHER\ EDUCATION}$ – coefficient of personnel with higher education; $C_{PROFESSIONAL\ GROWTH}$ – personnel professional growth/ training coefficient; $P_{INNOVATIVE\ TECHNOLOGIES\ INTRODUCTION}$ – productivity under innovative technologies introduction; a_{17}, a_{18}, a_{19} – respectively, the coefficients of the partial indicators importance in terms of integral index personnel component; $\sum_{i=1}^{3} a_i = 1$.
4	Resulting component joint index $I_{RESULTING\ COMPONENT\ JOINT}$	$I_{RESULTING\ COMPONENT\ JOINT} = C_{\text{INNOVATIVE ACTIVITY EFFICIENCY}} * a_{20} + C_{\text{NVESTMENT ACTIVITY EFFICIENCY}} * a_{21}$ where $C_{\text{INNOVATIVE ACTIVITY EFFICIENCY}}$ – coefficient of enterprise innovative activity efficiency; $C_{\text{NVESTMENT ACTIVITY EFFICIENCY}}$ – coefficient of the enterprise investment activity efficiency; a_{20}, a_{21} – respectively, the coefficients of partial indicators importance in terms of integral index resulting component; $\sum_{i=1}^{2} a_i = 1$.
5	Institutional component joint index $I_{INSTITUTIONAL\ COMPONENT\ JOINT}$	$I_{INSTITUTIONAL\ COMPONENT\ JOINT} = C_{\text{SUBSIDIES}} * a_{22} + C_{\text{PRIVILEGES (PROVIDED BY THE ENTERPRISE TO THE POPULATION)}} * a_{23} + C_{\text{SUBSIDIES FROM THE BUDGET TO COMPENSATE THE DIFFERENCE IN PRICE}} * a_{24}$ where $C_{\text{SUBSIDIES}}$ – the coefficient of subsidies (provided by the enterprise to the population) reimbursement from the budget, (%); $C_{\text{PRIVILEGES (PROVIDED BY THE ENTERPRISE TO THE POPULATION)}}$ – the coefficient of privileges (provided by the enterprise to the population) reimbursement from the budge, t(%); $C_{\text{SUBSIDIES FROM THE BUDGET TO COMPENSATE THE DIFFERENCE IN PRICE}}$ the ratio of subsidies from the budget to compensate the difference in price; a_{22}, a_{23}, a_{24} – respectively, the coefficients of partial indicators importance in terms of the integral indicator institutional component; $\sum_{i=1}^{3} a_i = 1$.
6	Social component joint index $I_{SOCIAL\ COMPONENT\ JOINT}$	$I_{SOCIAL\ COMPONENT\ JOINT} = C_{\text{ONCOLOGICAL NEOPLASMS DISEASESOH}} * a_{25} + C_{\text{PARASITIC AND INFECTIOUS DISEASES SPREAD}} * a_{26} + C_{\text{DIGESTIVE SYSTEM DISEASES SPREAD}} * a_{27} + C_{\text{WATER THAT HAS UNDERGONE WATER PREPARATION}} * a_{28}$ where $C_{ПОН}$ – the rate of the oncological neoplasms diseases spread within population; $к_{ппіз}$ – the rate of the parasitic and infectious diseases spread within population; $к_{пот}$ – the rate of the digestive system diseases spread within population; $пв_{водопідгот}$ – the proportion of water that has undergone water preparation for feeding to the network, %;; a_{25}, a_{26}, a_{27}, a_{28} – respectively, the coefficients of partial indicators importance in terms of integral index social component; $\sum_{i=1}^{4} a_i = 1$.

1	2	3
7	Ecological component joint index $I_{ECOLOGICAL\ COMPONENT\ JOINT}$	$I_{ECOLOGICAL\ COMPONENT\ JOINT} = N_{SOURCES}^{SANITARY-CHEMICAL\ INDICATORS} * a_{29} + N_{NETWORKS}^{SANITARY-CHEMICAL\ INDICATORS} * a_{30} + N_{SOURCES}^{MICROBIOLOGICAL\ INDICATORS} * a_{31} + N_{NETWORKS}^{NON-CONFORMITY\ TO\ MICROBIOLOGICAL\ INDICATORS} * a_{32} + \frac{V_{WITHOUT\ TREATMENT}}{V_{SEWAGE\ WATERS\ WITHDRAWN}} * a_{33} + \frac{V_{INSUFFICIENTLY\ WASTEWATERS}}{V_{SEWAGE\ WATERS\ WITHDRAWN}} * a_{34} + \frac{V_{SUFFICIENTLY\ WASTEWATERS}}{V_{SEWAGE\ WATERS\ WITHDRAWN}} * a_{35}$ where $N_{SOURCES}^{SANITARY-CHEMICAL\ INDICATORS}$ – the number of cases of centralized water supply drinking water (sources) samples non-conformity to sanitary-chemical indicators (from 100 samples); $N_{NETWORKS}^{SANITARY-CHEMICAL\ INDICATORS}$ – the number of cases of centralized water supply drinking water (networks) samples non-conformity to sanitary-chemical indicators (from 100 samples); $N_{SOURCES}^{MICROBIOLOGICAL\ INDICATORS}$ – the number of cases of centralized water supply drinking water (sources) samples non-conformity to microbiological indicators (from 100 samples); $N_{NETWORKS}^{NON-CONFORMITY\ TO\ MICROBIOLOGICAL\ INDICATORS}$ – the number of cases of centralized water supply drinking water (networks) samples non-conformity to microbiological indicators (from 100 samples); $V_{WITHOUT\ TREATMENT}$ – volume of drained wastewaters without treatment, thousands м3; $V_{INSUFFICIENTLY\ WASTEWATERS}$ – volume of insufficiently treated drained wastewaters thousands м3; . – volume of sufficiently treated drained wastewaters thousands. M3; $V_{SEWAGE\ WATERS\ WITHDRAWN}$ – total volume of sewage waters withdrawn, ths. M3; a29, a30, a31, a32 , a33, a34, a35 – respectively, the coefficients of partial indicators importance in terms of the integral indicator ecological component; $\sum_{i=1}^{7} a_i = 1$.

1	2	3
8	Innovations development integral index $I_{INNOVATIONS\ DEVELOPMENT}$	$I_{INNOVATIONS\ DEVELOPMENT} = I_{PRODUCTION\ COMPONENT} * C_{INDUSTRIAL} + I_{TECHOLOGICAL\ COMPONENT\ JOINT} * C_{TECHNOL} + I_{PERSONNEL\ COMPONENT\ JOINT} * C_{PER} + I_{RESULTING\ COMPONENT\ JOINT} * C_{RES} + I_{INSTITUTIONAL\ COMPONENT\ JOINT} * C_{INST} + I_{SOCIAL\ COMPONENT\ JOINT} * C_{SOC} + I_{ECOLOGICAL\ COMPONENT\ JOINT} * C_{ECOL}$ $K_{соц}$ $C_{TECHNOL}$ C_{PER} C_{RES} C_{INST} C_{SOC} C_{ECOL} where $C_{INDUSTRIAL}$, , , , , , – coefficients of importance respectively industrial, technical and technological, personnel, resultant, institutional, social and environmental components in terms of the integral indicator of water supply and wastewater treatment enterprises innovative development. $\sum_{i=1}^{7} C_i = 1$.

Source: *Author's development*

In order to qualitatively evaluate the integral innovation development indicator in the sphere of water supply and wastewater treatment enterprises, it is expedient to use the generalized utility function (Harrington scale), which involves the transformation of natural values of indicators into a dimensionless qualitative scale of desirability or preferences and establishing the correspondence between physical and psychological parameters. A qualitative assessment of the enterprises' integral innovation development indicator of can be determined using the developed tables of correspondences between the relation of advantages in empirical and numerical systems.

5. Discussion, Limitations and Future Research

A review of the economic literature confirms the thesis that today one of the main problems of the sustainable development of enterprises of any industry and the economy of countries as a whole is their low level of innovation, which is traditionally measured by almost all types of indicators used during the compilation of established statistical reporting.

Usually, these statistical indicators are quantitative measures in absolute calculation. The proposed methodology provides for the use of efficiency indicators of both resources and the latest technologies, which most realistically demonstrate whether innovative development is actually taking place in enterprises.

After all, we are talking about innovative development when, from one side, innovative types of products or services were introduced, and on the other hand, the negative impact on the environment increased as a result of not modernizing treatment facilities. Therefore, only the use of an integral indicator, which would comprehensively give an idea of the effectiveness of the implementation of

innovative measures, will allow to accurately, comprehensively and at the same time, relatively easily take into account the main aspects of the activities of enterprises and at the same time evaluate the level of their innovative development.

It should be noted that the implementation of an integral assessment of the level of innovative development of enterprises that provide services in the field of water supply, sewage and wastewater treatment is extremely relevant. At the time of application of the environmental and social component during the evaluacion. This is explained by the fact that these enterprises have a direct impact on the sustainable development of society due to the high degree of environmentalization of their activities.

The relationship between economic entities and the environment is reciprocal: on the one hand, there is a potential danger of the negative impact of the consequences of natural disasters on the activities of the studied enterprises, and on the other - the impact of the enterprises themselves on the environment due to the discharge of untreated and insufficiently treated wastewater.

In addition, they are characterized by an extraordinary social significance of activity, because they provide the physiological needs of every member of society and the production needs of other enterprises. And the quality of the provided services affects not only such social indicators as the quality of life, the state of health, but also the purchasing power of the population, social tension, the development of the social sphere as a whole, etc.

The information obtained from a complete and objective evaluation of the level of innovative development of the enterprise is an important basis for the developments and implementation of innovative projects and activities, as well as for making effective management decisions.

The results of the conducted research are the next step in methodical evaluation of innovative development' level of enterprises providing services in the field of water supply, sewage and wastewater treatment.

Due to the large volume of indicators of economic development that can be related with innovations, only the main components of methodological support for evaluating the level of innovative development were considered in the framework of the conducted research. The proposed methodology is only a necessary basic step and needs further analysis and improvement.

6. Conclusions

The practical significance of the implementation of the use by economic entities during the analysis of the economic activity's efficiency of the integral indicator of innovative development is for the managers/owners of the firm - in the opportunity

to support and improve the management of the enterprise to become an innovative leader. After all, the key to the growth of the innovation level's company is its constant development. To solve problems related to the economic, social or ecological sphere of economic activity is possible when they are quickly detected or warned.

The effect of a comparative analysis of the integral indicator of the innovative development of enterprises of the same industry can be to improvement of the main and auxiliary activities, the process of organizing the provision of centralized water supply and sewage services, this will allow to obtain an economic effect from innovations's introduction of in economic activity.

The next positive point is the social effect, which can be obtained both at the micro level (increase in employee incomes, increasing the number of jobs in the enterprise, staff participation in management, etc.) and at the macro level (solving social problems related to increase in the level of population disease).

The idea of introducing an innovative development's integral indicator of in terms of the development of certain indicators characterizing the environmental vector of the company's activity will also allow enterprises to compare their results with the results achieved in similar areas by other subjects of the industry.

This is an environmental effect, which can, for example, be expressed in an increase in the volume of water that must be disinfected before it is supplied to the network, a decrease in the volume of insufficiently purified and untreated return water, and an increase in the quality of drinking water and reducing the load on the natural environment.

Evaluation of innovative development using an integral indicator is important for potential investors. After all, the investor should know the real state of affairs in the field of innovation of the company. The result of such an evaluation can significantly influence both the formation of the enterprise's value and the decision regarding the feasibility of its acquisition.

Knowing the level of the company's innovative development indicator is important when changing ownership relationships (enterprise sale, privatization, lease), changing organizational forms (merger, takeover, division of an enterprise) and many others.

The use by authorities of the innovative development's integral indicator of the companies will provide an opportunity to analyze innovative activity at the level of the enterprise, industry, region, river basin, clusters and the country as a whole. Such an analysis is necessary for understanding, substantiation and decision-making regarding the financing of innovative measures aimed at protecting the environment from the budget funds.

Therefore, the introduction of the use of innovative development's integral indicator of the company is of key importance when making many decisions in the field of enterprise management, especially in the case of long-term decisions.

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