

European Science Review

2024, No 5–6

European Science Review

Scientific journal

2024, No 5–6

ISSN 2310-5577

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Premier Publishing Praha 8

Karlín, Lyčkovo nám. 508/7, PSČ 18600

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European Science Review an international, English language, peer-reviewed journal. The journal is published in electronic form.

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The journal has Index Copernicus Value (ICV) 92.08 for 2022.

SJIF 2024 = 6.735 (Scientific Journal Impact Factor Value for 2024).

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Section 1. Biology

DOI:10.29013/ESR-24-5.6-3-7



SPECIES COMPOSITION OF ECTOPARASITES OF CHICKENS IN CONDITIONS OF THE SOUTHERN REGIONS OF UZBEKISTAN

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Cite: *Omonova N. R. (2024). Species Composition of Ectoparasites of Chickens in Conditions of the Southern Regions of Uzbekistan. European Science Review 2024, No 5–6. <https://doi.org/10.29013/ESR-24-5.6-3-7>*

Abstract

The article presents the results of research conducted on the spread of chicken ectoparasites (footflies and hamazoid mites) in poultry farms and private households in the southern regions of Uzbekistan. During the research, samples of 380 bed-eaters and 590 gamozoid mites were collected and identified from more than 800 chickens suspected of mallaphagosis and dermanissiosis. The composition of ectoparasite species of chickens distributed in the region was determined. Among them, *Dermanyssus gallinae* from gamazoid mites, and *Menopon gallinae* species were found from mealybugs. The level of infection of chickens with ectoparasites (invasion extent and intensity of infestation) was determined by *Dermanyssus gallinae* mites (100% and 300–400), *Menopon gallinae* (90% and 150–250), respectively. Ectoparasites of chickens in this area, in warm climates, bioecological research and development of modern innovative control measures to fight against them.

Keywords: *Chickens, ectoparasite, Dermanyssus gallinae, Menopon gallinae, infestation, dermanysiosis, mallophagosis, extent of invasion, intensity of invasion*

Introduction

Poultry is the most important and economically productive sector of animal husbandry, or it cannot be said that “Poultry is one of the seven treasures”. The development of intensive poultry farming provides an opportunity to grow a lot and quality poultry meat in a short period of time. Egg production in the world is about 707 billion per year. is forming a unit. This would require approximately 2.8 billion egg-laying hens. Main egg producing coun-

tries: Asia 61.2% (China 47.5%, Japan 6.1%, India 4.2%), North America 15.6% (United States 11.0%, Mexico 3.8%), South America 2.8% (mostly in Brazil 1.8%), European Union 11.7% (France 2.3%, Germany 2.0%, Italy 1.7%, United Kingdom 1.5%, Netherlands 1.4%, Spain 1.4%), Eastern Europe 1.6%, Russia and Ukraine 5.7% and Middle East (mainly Turkey) 1.3% (Yaroshchuk, A.I., 2019). Today, 91935 000 chickens are raised in Uzbekistan and 7788 417,000 eggs are produced (Infor-

mation of the State Statistics Committee of the Republic of Uzbekistan, 2021). Recently, due to the increase in the average daily temperature in the world, it is related to the wide distribution of the parasitic mites (Mallophaga) and Gamasina (Gamasina) (Lyakhova, O.M., 2010). Mealybugs and gamozoid mites are a serious problem for poultry. They act on the body of chickens, causing discomfort and itching. As a result, chickens lay eggs less, when the invasion is at a high level, i.e., at the pathological-anatomical stage, signs of acute bleeding are observed, and some of them die (Akbaev, R.M., 2013).

The purpose of our research. Study of chicken ectoparasites of mealybugs (Mallophaga) and gamazoid (Gamasina) mites species composition and levels of infection of chickens with them.

Material collection and methods

In 2021–2022, the research was carried out mainly in the spring and autumn seasons in the poultry farms and households of the Kashkadarya region. We selected 10 to 50 chickens suspected of mallophagosis and dermanissiosis from each farm and subjected them to acarological examination. Collection of ectoparasites was performed using generally accepted methods. We pre-treated the isolated chickens with a talc preparation from the group of synthetic perethroids (neostomazan) to temporarily kill ectoparasites. The chickens were collected by combing the feathers on white paper, mites, and then placed in test tubes with 70% ethyl alcohol. In addition, samples were taken from the floor, walls, ceiling, feeding bowls, mangroves and other places of buildings where chickens are kept to collect ectoparasites of chickens. For difficult to sample areas (wall and floor cracks, etc.) we used cotton swabs with a cotton tip. We determined the species composition and amount of ectoparasites (ex/m²) in laboratory conditions using detectors.

Results and discussion

In the world, ectoparasites of agricultural poultry have been studied by scientists and researchers of many countries. Ectoparasites of birds can include insects and mites that parasitize them directly. These are feather and feather eaters, mites, lice, cockroaches, living

and feeding together with birds in poultry houses. Many dipterans, wasps, and beetles are carriers of bird diseases (Romashenko, P.V., Egorov, S.V., Malunov, S.N., 2015; Zakhvatkin, Yu.A., 2012; Safronov, F.M., 2017). In March–December 2021–2022, research was carried out in about 30 poultry farms in Karshi, Nishon Kasbi and Mirishkor districts of Kashkadarya region. Chickens of different ages and sexes were involved in the research. The main attention was focused on chickens with obvious clinical signs of molyphagous and drug-free. The shoulder, abdomen, head and cloaca area of the chickens were examined (Figures 1–2). Ectoparasites were collected from chickens by conventional methods and studied in the laboratory. We collected ticks from chickens by combing them on white paper, and we collected mites using cotton sticks dipped in ethyl alcohol. We analyzed the collected mealybugs and mites microscopically to identify the species. According to the microscopic examination, the following results were obtained. During the research, more than 800 chickens were identified and samples were collected from 380 menoponidae and 590 gamozoid mites. *Menopon gallinae* species belonging to the Menoponidae family and the *Dermanissus gallinae* species from Gamazoid (Gamasina) mites were found. In our research, the most common ectoparasite of chickens (Menoponidae) species *Menopon gallinae* was found to be a permanent parasitizer.

Menopon gallinae is a small, wingless insect, white-yellow in color, body length up to 2.5 mm. The body of the insect is divided into segments, and the seams between the segments are clearly visible. It has three pairs of jointed legs and a pair of antennae that are wider than the head.

The oral apparatus is rodent type. Aphids develop with incomplete metamorphosis, the larvae that hatch from the eggs turn into imago in 4–20 days or several weeks (Figure 3). As a result of microscopic examination of the obtained samples in the laboratory, the Ticks feed on skin secretions, feathers and feathers, as well as on the blood and lymph epidermis that has flowed out as a result of the skin and structure of feathers and feathers growing due to scratches and itching. In the process of inspection of chickens, most of the eggs are leaking at the base of the feathers,

the adult stages of the parasite are found on the skin and feathers of birds, mostly under the wings and around the cloaca and on the

head. In the process of parasitism, the affected birds are observed to shrivel, itch and scratch their bodies.

Figure 1, 2. *Infection of chickens with mallophagosis and dermanissiosis (original)*



Dermanissus gallinae is an ectoparasite, a blood-sucking gamazoid mite, the body is somewhat long oval, the back is wide, and there are many hairs. Khartoum and long legs. The chelicera is like a thin long needle, adapted to pierce the skin and absorb the mine. Red-brown, with white spots on the

back (shoulder). Female body length 0.75–0.84 mm (width 0.4 mm), male body length (0.3 mm width). Eggs are bubble-shaped, up to 0.3 mm in size, protonymph – transparent (0.4 mm), pale deutonymph length – 0.6 mm, widespread throughout the world (Yaroshchuk, A.I., 2019).

Figure 3. *External structure of Menopon gallinae (original)*



It mainly attacks wild birds and domestic birds in bird nests, cages, poultry houses at night, and hides during the day. Dermatitis and itching are observed when they bite people working in poultry houses. It is a carrier of many infectious diseases (especially chicken encephalitis). In chickens, insufficient blood (anemia) is observed, live weight gain and egg production are reduced (Omonova, N. R.,

Bobonazarov, G'.Yo., 2022). Larvae emerge from eggs laid by female mites 50–120 hours later, and less mobile larvae develop into protonymphs after 24–30 hours. Protonymphs suck the host's blood, move actively and turn into deutonymph, mature imago (male and female). A female mite lays 3–20 eggs. The number of eggs depends on how much blood they suck (Figure 4).

Figure 4. External structure of *Dermanissus gallinae* (original)



Due to frequent attacks and blood sucking of these mites, chickens lose weight, lay few eggs, and in some cases may die. During the study, more than 800 chickens, which were examined acarologically, were observed to be infected with mealybugs or red chicken mites in all (100%). The intensity and extent of infestation of chickens by *Dermanissus*

gallinae and *Menopon gallinae* are presented in the table above. The level of infection of chickens with ectoparasites (invasion extent and intensity of infestation) was determined by *Dermanyssus gallinae* mites (100% and 300–400), *Menopon gallinae* (90% and 150–250 mites), respectively (Table 1).

Table 1. Infection of chickens with *Dermanissus gallinae* and *Menopon gallinae* in the conditions of the southern regions of Uzbekistan

Types	Intensity of infestation. Average number per head	Invasion Extent (%)
<i>Dermanissus gallinae</i>	300–400	100
<i>Menopon gallinae</i>	150–250	90

Summary

As a result of the analysis of the species composition of ectoparasites of chickens (foot-eaters and gamazoid mites) distributed in poultry farms and private households in the conditions of the southern regions of Uzbekistan, the extent of infection of chickens with the red chicken mite *Dermanissus gallinae* is 100%, the intensity of invasion is on average 300–400 per head of chicken, *Menopon gallinae* with 90%, the infesta-

tion intensity corresponds to an average of 150–250 chickens per head. In this region, i.e. in hot climate, it is necessary to study the bioecological characteristics of chicken ectoparasites and to develop and implement modern innovative control measures against them.

Conflict of interest statement

The authors declared that they have no conflict of interest.

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submitted 17.07.2024;
accepted for publication 13.06.2024;
published 27.06.2024
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Section 2. Economic and management

DOI:10.29013/ESR-24-5.6-8-12



INNOVATIVE SPORT FINANCING POLICIES

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Cite: *Rovena Emazi, Entela Kushta. (2024). Innovative Sport Financing Policies. European Science Review 2024, No 5–6. <https://doi.org/10.29013/ESR-24-5.6-8-12>*

Abstract

The main factors that contribute to the success of sports policy are contextual, processual and specific (Houlihan, B., 2009). These three factors include ideas about entrepreneurship and innovation in contemporary sport policy. New funding policies and mechanisms have had a positive impact on the development of sport. The purpose of this investigation is to develop a model for the identification of the results of medals received by elite athletes in the last three years, their impact on the budget of sports federations, and to answer questions about the status of one of the phenomena. Related to this study aimed at assessing the assets and ways of identifying and developing talented athletes. The study was carried out on a specific sports basis, using data and results from national funding during the last four years, the results of athletes, medals in sports activities and a logical-deductive analysis of programs for the financial support of sports federations and elite athletes. A standardized questionnaire addressed to elite medalist athletes was also used. The results were found that in the first two years that The Council of Ministers decision came into effect, 5 awards were given to athletes and coaches, for three sports federations, and in the second year, 84 awards, athletes and coaches, were given to eight sports federations. Also, the results of the questionnaire showed that the new policies for 99% of the athletes were very motivating to achieve high results, but also 97% of them would work hard to extend their sports career as much as possible. From these data it is clear the positive result of innovative policies and the success of Albanian athletes in the international arena.

Keywords: *Sport policy, Sport Development, Medals, Elite Athlets*

Introduction

The main factors that contribute to the success of sports policy are contextual, processual and specific (Houlihan, B., 2009). These three factors include ideas about entrepreneurship and innovation in contemporary sport policy.

In recent years, the financing of sports in Albania has taken a new turn and has proven unprecedented success. New funding policies and mechanisms have had a positive impact on the development of sport and the way the budget has played a major role in this aspect.

Instead of general funding, there is a greater focus on sports that have shown high potential and are most in need of support. The decision approved by the Council of Ministers (Ministry of Education and Sports, Republic of Albania/ legal documents. no-789), regarding the way of rewarding and treating athletes who benefit from high-level status and their coaches, seems to have brought a new dimension to Albanian sports and athletes. Athletes who achieve high results in international and national activities, benefit from reward and treatment, according to the determinations made in this decision. The integration of sportsmen in the sports-oriented education system, of national security and defense and their employment in the structures of the Ministry of Defense and the Ministry of the Interior, but also the Decision of the Council of Ministers (Ministry of Defence, Republic of Albania/ legal documents), which determines that Sportsmen who achieve golden results in the Games Olympic, World and European Camps benefit from the honorary ranks of Colonel, Lieutenant Colonel and Major as part of the country's armed forces.

Athletes of individual sports, of the "young" category, who achieve results in international and national activities are also rewarded in the amount of 30 (thirty) % of the value determined for the "adult" category. The coaches of the athletes, who have benefited from the level status high, are rewarded in the amount of 40 (forty) % of the value that the sportsman benefits from.

Acknowledging Success through achievement medals and trophies has gone beyond numbers. They already reflect a more holistic vision of sport, focusing on medals and victories, but also on the positive impact that sport has on society. (Österlind, M., 2016) highlights how sport organizations having a 'contemporary concern for policy efficacy and goal achievement have led to an intensification of research-based policy measurement, review and evaluation'. Thus, sport policy that is entrepreneurial and innovative offers a way for organizations to achieve multiple objectives, including economic and social reasons.

The purpose of this investigation is to develop a model for the identification of the results of medals received by elite athletes in

the last 3 years, their impact on the budget of sports federations, and to answer questions about the status of one of the phenomena related to this study aimed at assessing the assets and ways of identifying and developing talented athletes. 1) If these innovative policies are a guarantee of success for Albanian sports? 2) What are the sports that are given the greatest priority? 3) Have they been motivating in the work and success of Elite athletes? The factors in the investigation were the way of identifying the impact of the new policies for funding in sports.

Method

The study was carried out on a specific sports basis, using data and results from national funding over the last 4 years, the results of athletes, medals in sports activities and a logical-deductive analysis of programs for the financial support of sports federations and elite athletes. The proposed study is experimental and offers a qualitative approach. A standardized questionnaire was also used by 24 elite medalist athletes in the adult category, but also young athletes who have benefited from these policies and specifically from the policy implemented in the framework of the rewards of elite athletes. The SPSS 22 program was used to calculate the mean, standard deviation and percentage values of the data collected for the study.

Results

Referring to the data on the number of awards that athletes and their coaches have received with the entry into force of the Decision of the Council of Ministers in the Republic of Albania, it is clear that the low number of awards received in 2021 and the sharp contrast with those received in 2022, where the number of rewards obtained for medals exceeds many times that of the previous year. It is also noticeable the increase in the number of sports federations that have won medals and as a result, rewards.

The following table reflects the number and distribution of awards won according to the Sports Federation.

The graph below shows the rewards of sportsmen and women based on their result and ranking in international activity and the amount earned by the sportsmen and their

coaches. From these results, we see that the rewards for the first place (Gold Medal) have

a high number and this is a positive indicator of the development of sports in our country.

Figure 1. The number of awards given by the Ministry of Education and Sports for medals in 2021 and 2022

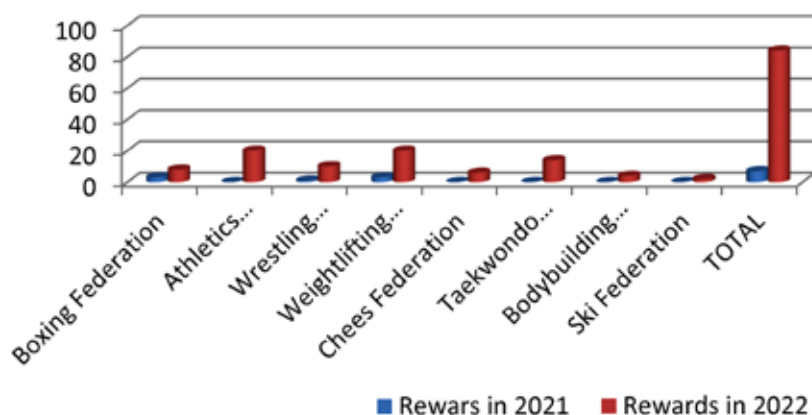


Figure 2. The number of rewards earned in the framework of the rankings, the amount earned in 2022

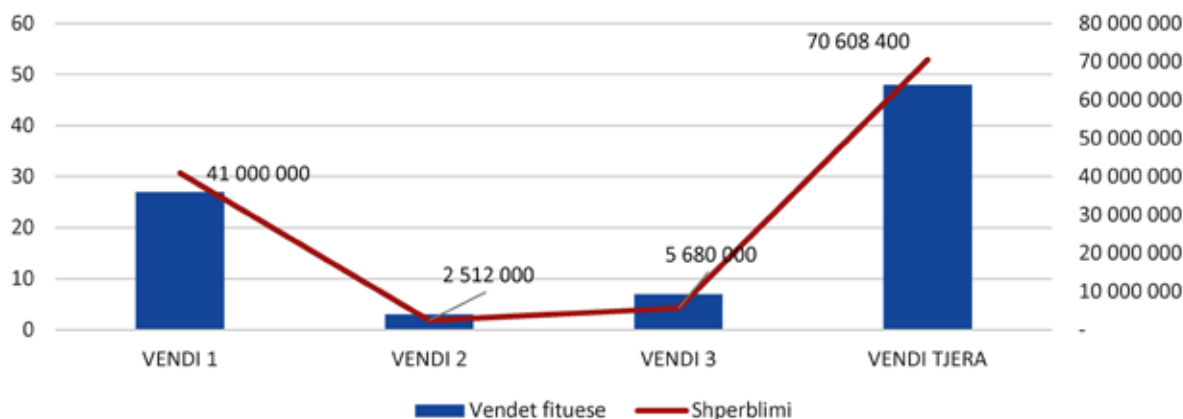
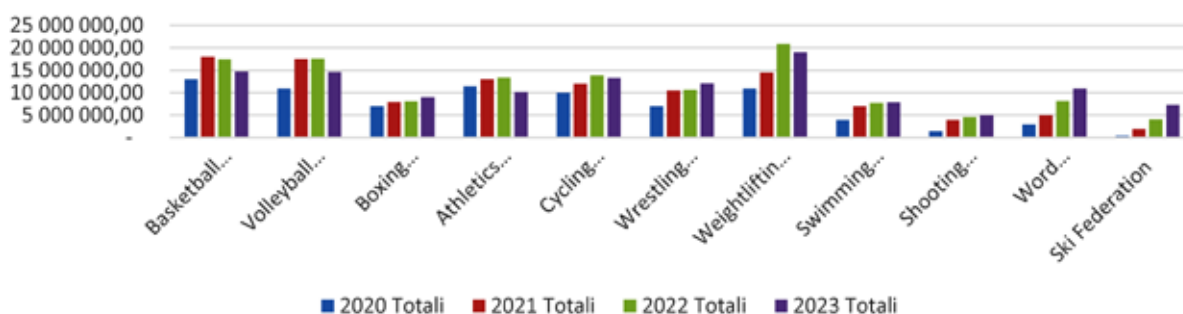


Figure 3. Financing of the Albanian Olympic Federations by the Ministry of Education and Sports 2020-2023

Financing of Albania Federation from 2020 - 2023



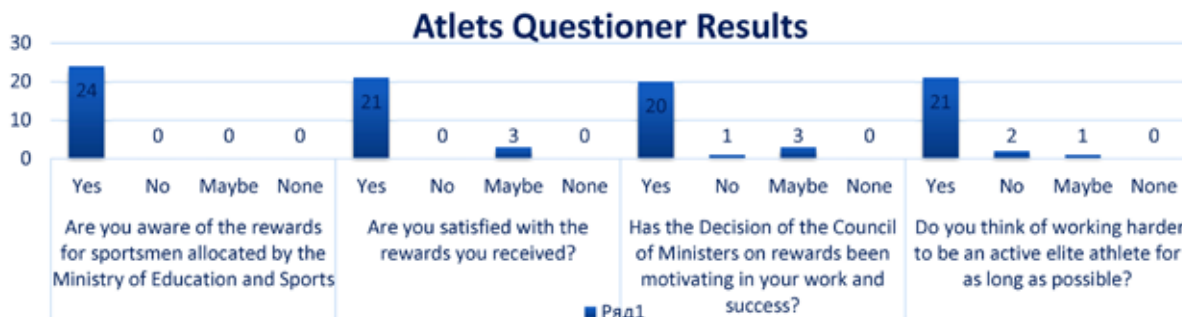
The results in figure 4 show the direct impact of these new policies on the elite athletes who answered the questionnaire, which was designed with several questions to understand, have they been motivating in the work and success of these elite athletes?

After the approval of the joint instruction on how to use the grant fund for the Olympic sports federations, the Albanian National Olympic Committee and OKAD, in which part of the criteria for evaluating the performance of the federations, it was determined that medals in international activities would

be evaluated with 24 points in total, scaled for the Art, Bronx and Silver medals, would be translated into available funds for the sports federations, it is clear that there is an

increase in the budget for the sports federations, which have benefited from many medals such as weightlifting, boxing, athletics, but also the ski federation.

Figure 4. The results of the questionnaire addressed to elite athletes



Note. Number of elite athletes total= 24.

Discussion

Sport is a policy mechanism for many sectors such as education, organizations and other subjects. (Houlihan, B., 2005) suggests that the government should be the inspiration, regulator, and provider of resources to exploit the benefits of sport'. Studies related to entrepreneurship and innovation in sports policies have become evident only recently. This change comes from more sport policy analysts trying to show how sport contributes to economic development, health aspect and social engagement (Stenling, C. and Sam, M., 2017). Currently, there is a lack of research on how sports policy is entrepreneurial and innovative in Albania, so this study can shed light on this issue and contribute to the development of sports policies in Albania. Referring to the data regarding the number of medals that our athletes have brought to the country, the difference from the year 2021, when the decision on the awards and the increase in the number of medals and awards for 2022 came into force, where their number increased a lot. It should be noted that in addition to the increase in the number of medals, many previously unknown disciplines were added for results that brought gold medals, such as bodybuilding. From the data of the first two years, it appears that after the decision of the Council of Ministers entered into force, 5 awards (athletes and coaches) were given to three sports federations, and in the second year, 84 awards (athletes and coaches) were given to eight sports federations. From these data, it is clear that

the positive result of the success of female athletes in Albania has continued during the year 2023, which turns out to be at the level of 2022.

In February 2022, the joint instruction on the way of using the Grant fund for the Olympic sports federations, the Albanian National Olympic Committee and Anti-Doping - NOC Albania was also approved, where in the criteria for evaluating the performance of the federations, it was determined that medals in international activities would be evaluated with 24 scaled total points for the Gold, Bronx and Silver medals, which based on the approved formula translates into eligible funds for the federations. For the above referred to the data in the chart. 2 for the budget, the results of these medals in the increase of the budget for the federations that have received more medals such as weightlifting, wrestling, taekwondo, boxing and athletics federations are also clear. The collected data shows that for the years 2021 and 2022 these five federations received about 54.34% of the total weight of the budget for the 17 Olympic federations. The questionnaire aimed at elite athletes to find out the impact of the policies undertaken showed that 99% of the athletes were very motivated to achieve high results, but also 97% of them would work hard to prolong their sports career as much as possible. , as well as 100% of these spristists had received from the state all the rewards they received. From these data, it is clear the positive result of innovative policies and the success of

Albanian athletes in the international arena, but also in the increase in funding of the Albanian Sports Federations that have had the highest performance.

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submitted 17.07.2024;
accepted for publication 07.06.2024;
published 21.06.2024
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DOI:10.29013/ESR-24-5.6-13-17



USE OF MARKETING METHODS IN STUDYING THE DEMAND FOR LOCAL PHARMACEUTICAL PRODUCTS

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Cite: Bobojonov B.R. (2024). *Use of Marketing Methods in Studying the Demand For Local Pharmaceutical Products*. *European Science Review 2024, No 5–6*. <https://doi.org/10.29013/ESR-24-5.6-13-17>

Abstract

This article explores the application of marketing methods to analyze the demand for local pharmaceutical products. Utilizing both primary and secondary research techniques such as surveys, focus groups, and interviews, the study identifies consumer behavior, brand loyalty, and decision-making processes among users of pharmaceutical products. The research highlights the importance of understanding market dynamics and consumer preferences to enhance marketing strategies for pharmaceutical companies. This comprehensive analysis provides valuable insights into the factors influencing the demand for pharmaceutical products and proposes strategic measures to optimize market penetration and competitive advantage.

Keywords: *Pharmaceutical Marketing, Consumer Behavior, Brand Loyalty, Market Research, Decision-Making Process, Competitive Analysis, Pricing Strategy, Promotional Techniques*

1. Introduction

Pharmaceutical businesses in various states are constantly attempting to increase revenues in addition to meeting patient demands for high-quality pharmaceuticals. One method for pharmaceutical sales is to find new markets, often in foreign nations. This is referred to as export marketing, which differs from individual sales. The marketing of goods in a foreign nation is more complicated. When a product is redesigned and certified, the resources and funds needed to enter different countries are significant. Mentality and consumer habits differ in different nations, and thus consume the industry. A brand that is well-known in its home country may not be so in a foreign coun-

try. Advertising for the definition of the best and most suitable demand market is essential for the business of export pharmaceuticals. It is critical for this reason that the appropriate export marketing research is conducted (R. Sterling and C. LeRouge, 2019).

Marketing involves recognizing and understanding the demands of clients and implementing competitive marketing policies based on the data collected. There are two types of marketing methods and techniques: primary and secondary. The use of marketing strategies and tactics has been investigated in every industry; nevertheless, studies on marketing approaches for pharmaceutical businesses are unusual. Most studies on pharmacy

marketing have explored the effectiveness of certain marketing processes and promotional medications. A few studies have been done on the digital marketing of drugs by manufacturers or makers (C. Lai, R. Deber, A. R. Jadad, and A. Shachak, 2021). Internet segmentation has grown in popularity as a market research tool for internet-based pharmacies. At the same time, it generates discussion for the development of promotional processes that are capable of collecting information on client wishes and market segmentation (D. Zoupos and G. Spais, 2022). To deal with electronic advertising strategies, digital marketing executives of these organizations need sophisticated and intelligent advertising tactics. Several tools of marketing have been evaluated in this analysis in order to determine which one is the most effective. Other kinds of pharmaceutical marketing tactics or strategies will be discussed in this research.

2. Market Research

The objective of the market research is to identify the structure and characteristics of consumer preferences for goods and specific goods at various price levels. It becomes the legal basis for companies, including vertical-integrated ones, to develop their marketing strategies. In addition, it allows for identifying certain market conditions that stimulate fierce protectionism and monopolization, especially during the crisis. This study is closely related to the works of domestic and foreign researchers who considered different aspects of the classification of medicines, the assessment of the role of pharmacies and pharmacists, the strategy of pharmaceutical companies in developing personalization, as well as the risks and market models in the pharmaceutical industry (M. Mohammadzadeh and N. Aryanpour, 2023). It is worth paying special attention to the study of pharmaceutical marketing by researchers, the use of social media by pharmaceutical companies for promotion and patient engagement, the importance of direct communication and advanced methods of promoting pharmaceutical products, the impact of sales force on the market penetration rate of pharmaceutical products, and the antecedents and consequences of relationship quality in pharmaceutical industries (Y. Ben Said, N. Luigi Bragazzi, and N. Valeryevna Pyatigorskaya, 2020).

3. Consumer Behavior Analysis

The respondent's characteristics reflect that more than half of the respondents (54.7%) are women, and 45.3% are men. From the respondents remark it is possible to notice that when choosing a pharmaceutical product, it is important for 31.6% of respondents to recognize a trade mark. This market direction of consumers' requirements confirms the fact that namely brand awareness ensures the product's demand. Brand awareness has the opportunity significantly minimizing the purchase risks for pharmaceutical goods for consumers due to insufficient information about drugs as the transcendent set of requirements, both based on rational consumption and emotional consumption. However, 68.6% of the respondents consider that the label has no importance when choosing OTC drugs.

3.1. Purchase patterns

According to the definition by Kotler et al. (1996), consumer behavior involves the study of the psychological mindset and the decision-making process of individuals when they select, secure, use or dispose of the products, services, ideas or experiences that they perceive would satisfy their requirements, preferences or desire. Consumer behavior is an attempt to understand why, how and when the consumer decisions were made. The concept of consumer behavior not only integrates many disciplines, such as economics, psychology, sociology, social anthropology, but also focuses on understanding the shoppers, retailers, and target groups for marketers. The above discussion of Sales and Marketing have shown the marketers from the same country and also foreign origin will make special offer (sales promotion) as their strategy for their products. Every time, the consumer will experience different attitudes, likes, or dislikes. From authors experiences it is similar to pharmacies activities. Sometimes they have stock and sometimes they do not have the stock, also consumer's need and demand in the health pharmacy have been changed from time to time (Y.H. Ryu, M. Gabriela Navarro, A. Gould, M. D. Albrow et al, 2019).

3.2. Brand loyalty

The level of brand loyalty can vary depending on the product, the category of the customer, the brand loyalty can be variable for every customer. Customer differences

(on age, education, income, gender, ethnicity and regional differences) and different brand selection behavior all influence the level of brand loyalty. Brand loyalty can be segmented in different categories according to customer loyalty. Brand insistence defines a level in the chain where a consumer has already created a loyalty. At that level, consumers are motivated by the brand and not ready to make another rational option for price changes, and any other competitor advantages to be seen. Brand recognition refers to those consumers who have not reached the stage of loyalty. At the recognition level, consumers distinguish distinction about the demand in a supermarket and select an option or a brand among several ones after scrutiny.

Brand loyalty is beneficial for the firms for such reasons: i) With the growth of the importance of brands in the market, brand loyalty and brand satisfaction have become one of the most significant marketing functions at present; ii) Investing to develop brand loyalty is less than to obtain new customers or keep the existing customers, and the probability that a loyal brand consumer repurchasing is higher than non-loyal brand consumer in any case of price changes by taking into account the product quality; iii) More loyal consumers act as a medium on communication regarding to their satisfaction about the brand quality and other brand qualities to their relatives, friends, groups etc. Neutral or unhappy consumers' communication is tense mostly by comparison to loyal consumers' positive communication. Consuming loyal consumers act as free advertising source; iv) Loyal consumers are resistant to the offers made by the new entrants and during the recessions, loyal consumers can keep firms at better position compared to the non-loyals (A. Čufar, A. Mrhar, and M. Robnik-Šikonja, 2014).

3.3. Decision-making process

Marketing branches and organizations have made massive use of data mining techniques. It has been used in marketing to fifth traditional processes like market research, customer segmentation, merchandizing, and store design. Many opportunities have been generated for marketing science research by the establishment of relationships of marketing with data mining. Associations are the primary type of relationship which involves

correlations and patterns of transactions or examination of customers in machine learning. Brand attitude involves the values that a consumer can affiliate with the brand such as innovative, useful, and satisfying. Brand attitude has been identified to have a substantial impact on customer preferences, purchase intentions, call for prices, and market shares (M. Turki Alshurideh, B. Al Kurdi, H. Almomani, Z. Mohammad Obeidat et al., 2023). Data mining ways can classically be adopted to monitor the strength of the associations with the demonstrations in the course of perceptual mapping, correspondence examination, and other deduced processes.

4. Competitive Analysis

A key issue in the competitive strategy of the pharmaceutical industry is the speed and timing of market penetration. The short-term exclusivity of new drugs places a premium on speeding up market penetration through optimized marketing, ideally including careful segmentation to avoid waste and an adaptive mix of strategies and tactics that are continuously fine-tuned over time. In affluent countries, enforced regulation of drug prices limits profitability of successful new drugs, as well as delays market penetration and discourages innovation and competition. In emerging markets, the absence of such regulation necessitates a more aggressive penetration strategy, along with action to protect the product against counterfeit and illegal supply. The development of strong pre-clinical and clinical data, of genuine innovations, and the pursuit of clinical excellence, including the long-term benefit-risk profile and real-life evidence, protect and maximize the value of the asset. The phase of development at in-licensing also determines the potential for significant profitable in-licensing opportunities.

The competitive analysis in the pharmaceutical industry is a strategic approach with defining and accessing the competitors in the targeted market, and using this information to make good business decisions. Competitive analysis is a critical part of the business planning process. Every successful business requires knowledge of the strengths, weaknesses, opportunities, and threats (SWOT) and knowledge of the competitive landscape of the pharmaceutical category. Competitive

analysis of the environment in which a firm competes is a crucial part of strategic planning. It identifies the competitors in a market, with specific reference to their strengths and weaknesses. When carried out systematically, it helps in formulating a marketing strategy.

4.1. Identifying competitors

Several simplifications weigh the pertinence of some of the above specifications, as identified by economists working on health products, and notably two simplifications can be mentioned here. First, hospitalisations are heterogeneous; at least several services are provided to the patient at the same time, and at least a common critical resource is shared among patients. Because of this treatment and demand-studies specificity, some of the above cluster levels are intentionally disregarded by French antitrust authorities. Local health networks do not gather products competitors in the Alcoa–Brown Shoe sense. The drug against hypertension competes with, not the generic against the Lipid Regulation, but maybe with the photoprotector used to prevent skin cancer, or the generic against the Glaucoma.

Theoretical perspectives on the identification of the relevant cluster level when studying the demand for health products have suggested measuring concentration by group of patients. This would imply that two products are considered as close substitutes when they treat the same disease. For the same reason, hospitalinpatient or hospital-outpatients specifications also seem relevant, and many data sources like the DRG, PMSI, or main EBM database are hospital-inpatients specifications. If the Smith index measures only competitive forces, the Lerner index mixes competitive and demand forces if the private final demand for health products is used to measure a industry price. Other hospital-level specifications than the DRG specification are potential competitive drivers.

4.2. Analyzing market share

He potential success of “Pha-anxur” products in the external pharmaceutical market in trade segments public, clearly with hydrological restrictions, therefore limited, and private market is explicitly prevented from accepting the company’s products in a free market and without HC permission. Traditional and classical theory of external

pharmaceutical trade, but under the specific conditions of this particular case, the listing of the company’s products in the chronic untreatable local diseases has a high probability to improve company’s market share (Turki Alshurideh M., Al Kurdi B., Almomani H., Mohammad Obeidat Z. et al. 2021). In addition, a complete profit holds for reasons in the shipping costs; while in segment Girls, (profit-loss area) the company’s Adjustment can still reduce the value and thus reach a sense of profit after special offers, discounts, and redistribution of company’s resources. Four possibilities are associated with a skew trade to reach the balance and the wholesale price. One of them is connected with the global sector; global pharmaceutical, products that are easily capable to meet the normative hydrological demands; another to be connected with the public sector with some regulatory control and guaranteed customs; a group, connected with the not covered, but want to be in anyway is connected.

5. Pricing Strategy

This article investigates demand for local but internationally certified pharmaceutical products in the Republic of Belarus. Demand for drugs was studied using marketing methods and presented in a systematic form under three types of the markets: potential, available and target markets. The purpose of the work is to provide product manufacturers that use extracts from Meldonium and another local terminally sterilized pharmaceutical products with comprehensive information regarding the decision-making process of conducting pharmacoeconomic research on the one hand, and the method of justifying marketing strategies on the other. Low-effectiveness of pharma-economic research in the field of terminally sterilized pharmaceuticals is a significant barrier on the way to efficient market share management. The innovative aspect of the article is to formulate the method of selecting the object of research and justify the application of marketing methods for studying demand. The practice of most local producers of terminally sterilized drugs in the Republic of Belarus for the first 30 years of the country’s independence is studies of pharmacotherapeutic equivalence with a mandatory demonstration of better paramet-

ric results than the priority drug. Experience of the last 15 years, however, characterizes the producers as “stubborn” and “vain”, hence the term crush, while the producers could not find and could not see the demand. Such derivatives, as low or no demand, lead to the destruction of the local manufacturer, is the challenge of the methodological resolution of this article.

6. Conclusion

The paper illuminates peculiarities of conceiving and evaluating the local market demand for pharmaceutical products and the essential role of marketing approaches, proceeding from the using of innovative marketing methods and tools. The results make it possible for pharmaceutical companies to analyse the current development and actual demand for local pharmaceutical products, bring to light the customers’ perceptions and attitudes or, in short, to study the local pharmaceutical market. Thus, the research explains that the local manufacturers should

not ignore to study the actual demands of the customers before marketing of pharmaceutical products.

The demand for drugs in Uzbekistan has increased by 4.3% in 2020. This industry is also affected by stricter regulations, more demanding stakeholders like patients and public buyers and overwhelming competition due to the entry of new generic products with limits on marketing as well as pricing. Therefore, it is now important for local manufacturers to be competitive in the market. Taking into account that the production of pharmaceutical products in Uzbekistan is in its growth stage from the product life cycle, developing and implementing a successful marketing strategy is required. However, to do this, it is essential to diagnose market demand and customers’ perception of local pharmaceutical products. Unfortunately, insufficient attention has been paid to the study of the marketing methods in identifying and raising of demand for local pharmaceutical products.

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submitted 17.07.2024;

accepted for publication 11.06.2024;

published 25.06.2024

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DOI:10.29013/ESR-24-5.6-18-23



INTELLECTUAL PROPERTY MANAGEMENT TO SERVE THE INNOVATION ACTIVITIES OF VIETNAM'S ENTERPRISE

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Cite: *Nguyen Huu Xuyen. (2024). Intellectual Property Management to Serve the Innovation Activities of Vietnam's Enterprise. European Science Review 2024, No 5–6. <https://doi.org/10.29013/ESR-24-5.6-18-23>*

Abstract

Intellectual property (IP) that are effectively exploited will determine the competitiveness of the economy, accelerating the innovation process of economic sectors and businesses to create many new products and processes, new methods of organizing production, accepted by the market and society. Effective IP management will promote the process of protecting, maintaining and developing a business's brand, associated with intellectual property rights in economic activities, technology transfer and innovation. By using qualitative and quantitative research methods, this article will clarify the current status of enterprises' IP management capacity, thereby proposing policy solutions to support the improvement of IP management capacity to serve the innovation activities of Vietnam's enterprise.

Keywords: *Intellectual property management, innovation*

1. Research overview

Effective IP management will encourage research, technology development and improve the quality of products supplied to the market. IP protection will limit violations such as the exploitation of IP without the permission of the patent owner, or the production of counterfeit goods and other violations. In the long term, the IP system has a proportional relationship with technological development, playing a positive role in economic development. In fact, in some ways, a weak IP protection system will allow a country to improve its technological capacity at low cost, especially low-middle income countries. However, it must be affirmed that a strong IP system is always the goal for

rapid and sustainable economic development of a country. Developing IP, especially patent, and improving IP management capacity to serve innovation activities is of interest to many countries around the world. According to the World Intellectual Property Organization (WIPO, 2022), a total of more than 1.6 million patents were granted in 2021, of which 88% were granted to inventors in 6 countries (China, USA, Japan, Korea, Germany, UK). China leads, accounting for 38% (equivalent to more than 607,000 patents); next is the US with more than 286,000 patents, Japan ranks third with nearly 257,000 patents.

Intellectual property management is closely related to the innovation activities of

enterprise. Economic benefits brought by natural assets can be direct or indirect benefits: direct benefits are income streams generated from the direct exploitation and use of natural assets (income from transfer and transfer of public assets, from saving costs of renting and purchasing public assets); Indirect benefits are income streams from the consumption of products/services containing assets, excess profits or increased income for the business. Recognizing the benefits that IP brings to businesses through innovation, many businesses around the world have continuously increased registration for protection of IP. For example, for large US enterprises, in 1975, the proportion of IP value only accounted for about 16.8% of the value of the enterprise, by 2005 this proportion accounted for about 80%, meaning the value of tangible assets only accounts for about 20% of the total value of the business. In particular, in some fields, the total market value of an enterprise is almost determined by the value of IP, as in the field of essential goods it is 94%, healthcare 89%, and information technology 82% (Russel and Gordon, 2010). Previously, most of the value of a business was determined by monetary assets and tangible assets, but now those assets have been almost replaced by assets and other intangible assets. According to Interbrand (2013), IP has also brought great commercial value to businesses, for example: in 2013, the value of the “APPLE” brand was 98.3 billion USD, “GOOGLE” was 93 billion USD, “.3 billion USD, “COCACOLA” is 79.2 billion USD, “IBM” is 78.8 billion USD, “MICROSOFT” is 59.5 billion USD. This shows that IP plays a role in creating market value for businesses, is profitable and is an important tool to promote economic growth.

In Vietnam, IP management to serve innovation activities is of interest to the Party and State. The IP strategy until 2030 was approved under Decision No. 1068/QĐ-TTg dated August 22, 2019 of the Prime Minister, with the view that IP activities have the active participation of all. All entities in society, including research institutes, universities, creative individuals, especially businesses, play a key role in creating and exploiting IP. Resolution No. 52-NQ-TW dated September 27, 2019 of the XII Politburo requires the effective and reasonable protection and exploitation of IP cre-

ated by Vietnam. The Law amending and supplementing a number of articles of the IP Law, effective January 1, 2023, has institutionalized the Party and State’s guidelines and policies on IP in the direction of innovation is encouraged, IP rights are protected and enforced effectively. During the period 2020–2023, 60 Vietnamese localities have issued documents related to policies to support and promote the protection, management and development of local IP. During the period 2014–2023, the average annual growth rate of patent and utility solution applications in Vietnam is 9.8%. Foreign entities have a total number of patent applications of 60,517, 7 times higher than Vietnamese entities (7,560 applications). However, the total number of utility solution registration applications in the past 10 years by Vietnamese entities is more than 1.3 times larger than that of foreign entities. The growth rate of utility solution registration applications by Vietnamese entities is 12%/year, higher than the growth rate of foreign entities (9.4%).

Intellectual property is considered a lever for innovation (Dinh Huu Phi, 2022). Innovation activities have many different levels. It could be implementing a new idea, creating inventions, useful solutions, works of art or new plant varieties. Supporting businesses to innovate through IP is also promoted in Vietnam, helping businesses better manage and exploit sources of IP. Typical examples: intellectual property management model at Hanoi Dairy Joint Stock Company, DABACO Vietnam Group Joint Stock Company, Ha Long Shipbuilding Company Limited, Vinh Thang Joint Stock Company. The IP development program has supported international patent protection for Vietnamese scientists, and supported the exploitation and application of inventions for science and technology organizations. Thereby contributing to promoting innovation and creating value for businesses and society; at the same time, it has supported the protection and management of intellectual property for agricultural products, such as Cao Phong oranges, Hoa Binh province; Pomelo in Binh Minh year, Vinh Long province; Ca Mau tiger shrimp, Ca Mau province; Cau Duc Cluster in Hau Giang; Ha Giang Orange, Ha Giang province; Cu Lao Cham bird’s nest – Hoi An, Quang Nam province; Phu Yen spiny lobster, Phu

Yen province; Hue Melaleuca oil; Ham Yen Orange, Tuyen Quang province.

Thus, all countries pay attention to IP management to improve innovation capacity in businesses. IP has a wide scope, this article limits the scope of IP that is subject to industrial property rights to include: inventions, utility solutions, industrial designs and trademarks. Based on the assessment of the current situation, will propose solutions for IP management capacity to serve innovation activities in Vietnam's enterprises.

2. Research method

To obtain information about IP management and innovation at enterprises, this study collects secondary data through research works published domestically and abroad, analyzing analyze policy and legal documents of countries to see the relationship between IP management and innovation activities at enterprise.

To further clarify the results of research on IP management serving innovation activities in Vietnam's enterprises, the study conducted a survey of experts, entrepreneurs, and managers in Vietnam (Convenient sampling with 109 businesses) in the field of science and technology, this is one of the limitations of this study. The information obtained is one of the important bases to evaluate the current situation and propose solutions to improve policies to support businesses in managing IP to serve innovation activities in Vietnam.

3. Research result

About innovation activities. Compared to small enterprises, large enterprises pay more attention to innovation activities with 7.5% of large enterprise having a science and technology fund compared to 1.5% of small enterprises and 4.0% of medium-sized businesses; and 18% of large enterprises have an R&D department compared to 3.1% of small enterprises and 8.9% of medium enterprises. These things have greatly affected the innovation activities of enterprises when innovation has been implemented in 67.2% of enterprises with science and technology fund, compared to 27.4% of enterprises without science and technology fund. Similarly, innovation has been implemented in

71.5% of enterprises with an R&D department, compared to 26.3% of enterprises without this department (NASATI, 2022). Innovation activities in enterprises in the form of purchasing and renting technology, machinery, and software account for the largest proportion of 18.8%, followed by self-conducting R&D, 11.8%, and marketing activities. and brand equity is 10.3%; The lowest form of innovation is buying products/brands from outside (1.8%). The rate of enterprises innovating products is 14.2%, of which 6.8% of enterprises innovate only products and 7.4% of enterprises innovate both products and processes. By enterprise size, 28.8% of large enterprises have product innovation compared to 9.7% of small enterprises and 20.3% of medium enterprises. Basically, innovative products are made by enterprises themselves (99.1% for large enterprises, 92.8% for small enterprises and 90.5% for medium enterprises).

Regarding IP activities. In 2022, the Vietnam Intellectual Property Office (NOIP) received 140,903 applications of all types (an increase of 7.1% compared to 2021), including 78,086 applications to register industrial property rights (an increase of 3.3% compared to 2021), and 62,817 other types of applications (an increase of 12.1% compared to 2021). The NOIP has processed 113,906 applications of all types, including 65,466 applications to register industrial property rights (down 12.2% compared to 2021) and 48,440 other applications/requests (up 3.4% compared to 2021); granted 42,279 industrial property protection certificates (an increase of 8.3% compared to 2021).

The State's support for businesses has improved over the years. Enterprises receive support from the State mainly through technological innovation policies (35.5% of enterprises in 2021 compared to 16.3% in 2018) and credit (26.4% of enterprises compared to 20.3% in 2018). Small businesses receive more support than large businesses, while medium-sized businesses have not received much attention.

The result of a survey of 109 enterprises show that having a high awareness of the importance of implementing innovation activities and IP management (Table 1).

Table 1. *Enterprise awareness of the need to carry out innovation activities and IP management*

Innovation activities	Average score	Standard deviation
Product innovation activities	4.24	0.792
Process innovation activities	4.07	0.754
Organizational innovation activities	4.20	0.950
Marketing innovation activities	4.18	0.735
Activities of establishing IP rights	4.34	0.863
Activities to protect IP rights	4.06	0.864
Commercialization of IP rights	4.24	0.92
Collaborative activities to improve IP management capacity through innovation	4.22	0.786

Source: survey result

In terms of relationships, enterprise awareness of innovation activities (IN) is positively related to activities of establishing IP rights (XLQ), Commercialization of IP rights (TMH). Collaborative activities to improve IP management capacity through innovation (LK), at the same time, it is inversely proportional to the protection of IP rights (BVQ).

$$F(IN) = 3,813 + 0,075 * XLQ - 0,074 * BVQ + 0,098 * TMH + 0,046 * LK.$$

The capacity to manage IP to serve innovation activities of enterprise is demonstrated through: the capacity to plan for receiving IP to serve the enterprise's innovation activities; planning capacity to establish IP rights to serve the enterprise's innovation activities; capacity to organize commercialization and transfer of IP to serve innovation activities of enterprises; the capacity to create IP to serve the innovation activities of enterprises; capacity to build a process to control IP to serve the enterprise's innovation activities; capacity to build coordination and linkage processes to develop IP to serve the enterprise's innovation activities. Although enterprises have carried out activities to improve their capacity to manage assets. However, the results achieved are not high, there are still many limitations, of which, build coordination and linkage processes to develop IP to serve the enterprise's innovation activities is of most concern to enterprises (Average score 2.74, standard deviation 0.907) and the least paid attention is capacity to establish IP rights to serve the en-

terprise's innovation activities (Average score 2.29, standard deviation 0.831).

The ability to manage IP to serve the innovation activities of an enterprise depends on many ideas, wishes, and aspirations of senior managers in the enterprise; practical issues arising in the enterprise's production and business activities; competitive pressure and State support packages through preferential policies. Among them, the aspirations of senior managers and the State's support packages have the most important significance in improving the capacity to manage IP to serve the innovation activities of enterprises.

In addition to the fact that enterprises have a high awareness of the need to carry out IP management and innovation activities, enterprise also have a need to improve the capacity to manage IP to serve innovation activities. Survey result with 109 observations showed that 80.7% agreed with this statement (Average score 4.22; standard deviation 0.916). Of these, 30.3% are interested in exploiting patent and useful solution, 14.7% are interested in industrial design, 39.4% are interested in trademark and 15.6% are interested in to other types of IP to promote innovation activities. In particular, enterprises pay a lot of attention to the exploitation of Vietnamese inventions and useful solutions that are protected, foreign inventions that are not protected or whose protection period has expired in Vietnam; IP management support activities for enterprise, especially IP valuation consulting and auditing support activities, focusing on patent and trademark.

Even though enterprises have a need to improve their capacity to manage IP to serve innovation activities, the number of businesses with R&D departments and establishment of science and technology development funds is not many. Survey results show that 76.1% do not have a clear specialized R&D department (a specialized R&D department is understood as a department/department, a center or can be a team, a department with the following functions: specializing in research, testing, development of new products, new technological processes or research on technical improvements of existing products and technological processes), although there are still part-time personnel R&D activities. This also has certain similarities with the results of a survey of 7,128 businesses (NASATI, 2020): 763 enterprises (10.7%) said they had an R&D department, of the 763 enterprises with an R&D department, there are 728 enterprises ((95.4%) with innovation. Thus, if an enterprise has an R&D department, it can be confirmed with 95.4% confidence that the enterprise has innovation.

4. Conclusion and recommendation

Firstly, complete policies to support the enterprise in developing plans to receive and establish IP rights to serve the enterprise's innovation activities. Receiving and establishing intellectual property rights will be input for the innovation process of enterprise. Therefore, it is necessary to continue to support enterprise in researching, analyzing the market, identifying types of IP, setting goals and supporting resources to achieve goals. In addition, it is necessary to create a favorable legal environment and improve policies and laws on IP in the direction of integrating policies to promote innovation, establish and protect IP rights in strategies, innovation development policy, economic, cultural and social.

Secondly, support the enterprise in organizing the commercialization and transfer of

IP to serve their innovation activities. To do this, the State needs to encourage and improve the efficiency of exploiting intellectual property by forming and developing a network of innovation and technology transfer centers at research institutes, universities and research institutes and large businesses; promote the implementation of policies to develop industries with high level of using IP, creating quality products for export.

Thirdly, have adequate support policies for enterprise to create IP to serve their innovation activities. The State needs to encourage the creation of creative ideas, research and develop ideas into all kinds of IP, promote technology improvement from IP to create products and services with high added value; guide the enterprise to create and effectively exploit commercial instructions for products and services.

Fourth, support the enterprise in building a process to control IP for innovation activities; strengthen coordination between state administrative agencies and judicial agencies in protecting IP rights; coordinate research on strengthening the role of courts in resolving IP cases; promote the development of IP appraisal services and legal consulting services on IP rights protection to better serve innovation activities of enterprise.

In addition, support the enterprise in building coordination and linkage processes to develop IP to serve innovation activities; view the state's S&T funding as a budget to support development and S&T products as public goods, not public assets; there are preferential loans and taxes for the development of high technology, green technology or high technology combined with green technology to promote the development of internal core technology based on IP.

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submitted 17.07.2024;

accepted for publication 18.06.2024;

published 02.07.2024

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DOI:10.29013/ESR-24-5.6-24-29



EMPIRICAL STUDY ON REGULATORY SANDBOX APPLICATION BASED ON SIMULATION AND REINFORCEMENT LEARNING

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Cite: *Yang Xuan. (2024). Empirical Study on Regulatory Sandbox Application Based On Simulation And Reinforcement Learning. European Science Review 2024, No 5–6. <https://doi.org/10.29013/ESR-24-5.6-24-29>*

Abstract

This paper addresses the challenge of risk pricing in commercial banks amid increasing systemic risks influenced by global economic fluctuations, policy adjustments, and major global events. We introduce a novel framework combining digital twin technology and deep reinforcement learning to aid in more effective interest rate pricing decisions. By constructing a digital twin environment that simulates the operational conditions of commercial banks under various scenarios, and employing deep reinforcement learning models, the framework aims to devise optimal interest rate strategies that align with the banks' objectives. Our empirical analyses demonstrate the superiority of this AI-driven approach over traditional expert pricing methods, offering a robust decision support system for managing risk pricing in commercial banks.

Keywords: *Commercial Banks, Risk Pricing, Digital Twin, Deep Reinforcement Learning, Interest Rate Pricing, Systemic Risks, Simulation Environment, Financial Technology, Decision Support System*

Introduction

Commercial banks are professional institutions that operate with risk, and risk pricing is one of the core issues that commercial banks must face. In their long-term operations, banks have gradually formed a variety of risk pricing strategies and schemes to deal with non-systematic risks. However, in the current environment, the increasingly complex factors such as global economic cycle fluctuations, monetary policy adjustments, the impact of the Russia-Ukraine war, and the COVID-19 pandemic have led to the continuous increase of systemic risks globally. How to conduct interest rate pricing has become a

major challenge for commercial banks. How commercial banks in the new era can conduct more scientific risk pricing has become a problem worthy of in-depth research. This paper innovatively proposes a framework for commercial bank risk pricing decision support that fully considers the impact of systemic risk factors: First, through business sorting, a digital twin environment is constructed based on macro and micro environmental factors.

I. Research Review of Simulation and Reinforcement Learning Techniques

The digital twin environment referred to in this paper is mainly constructed based on

simulation technology. The basic idea is to establish an experimental model that contains the main characteristics of the research system, and by running this experimental model, the necessary information to be studied can be obtained. In the fields related to commercial banks, many scholars have conducted research on simulation technology: In February 2017, Cui Yu et al. used the SIRS simulation model to study the risk cross-contamination mechanism between financial markets, which helped enhance the national financial market's risk prevention and control capabilities.

In February 2020, Grundke P and Kühn A built a simulation environment containing credit risk, interest rate risk and liquidity risk, using classified balance sheets to measure the impact on the Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR). In March 2020, Zhang Shanshan established a systemic financial risk simulation model through system dynamics and conducted sensitivity analysis to detect sensitive risk factors, which has certain guiding value for preventing systemic risks in finance. In May 2021, Seyed Mohammad Sina Seyfi et al. proposed a Monte Carlo simulation algorithm based on a Gaussian mixture model, which can achieve fast and accurate calculation of Value-at-Risk (VaR) and Expected Shortfall (ES), having a positive effect on the financial risk market. In September 2021, Wang Dingxiang et al. focused on the accounts receivable financing model, and based on the analysis of credit risk transmission factors and transmission mechanisms in supply chain finance, they built intensity models and SIR models and conducted simulations to provide preventive measures for credit risk management in supply chain finance. In October 2022, Wu Yongfei et al. innovatively introduced digital twin technology and built a “digital twin environment on the bank's asset side” and a “digital twin environment on the bank's liability side” respectively, simulating the future operating conditions of commercial banks under different risk scenarios and different pricing strategies, providing a reference for bank risk pricing decision support.

The reinforcement learning used in this paper is an important branch of machine learning. Unlike supervised and unsuper-

vised learning, reinforcement learning is a self-supervised learning approach: the agent is trained based on action and reward data, and optimizes its action strategy; on the other hand, it autonomously interacts with the environment, observes and obtains environmental feedback. Many researchers at home and abroad have conducted research on reinforcement learning technology: In 2015, Mnih et al. published a paper in “Nature”, proposing the Deep Q Network (DQN) model that combines deep learning and reinforcement learning, which can reach a level beyond human players after a period of training in the Atari 2006 game. The DeepMind team developed AlphaGo/AlphaGo Zero programs based on deep neural networks, using the Monte Carlo Tree Search (MCTS) algorithm, and combining supervised learning and reinforcement learning training methods, learning go strategies that surpass human level, defeating top human players Li Shishi in 2016 and Ke Jie in 2017. In 2019, Tencent developed the “Absolute Enlightenment” based on deep reinforcement learning technology, which can surpass professional players in the game of King of Glory. In 2022, Wang Yanbo et al. applied deep reinforcement learning technology to the medical insurance fund allocation decision problem, and the empirical results showed that the results given by reinforcement learning can greatly save time and labor costs, providing decision support for medical insurance fund allocation work.

II. Empirical Research on Commercial Bank Risk Pricing Based on Digital Twins and Reinforcement Learning

2.1 Business Understanding

In their long-term operations, commercial banks have gradually formed a variety of risk pricing schemes represented by the cost-plus method and the benchmark interest rate method. The cost-plus method is obtained by comprehensively examining the financing costs, operating costs and customer default costs of the loan, and then adding a certain expected profit. This method pays less attention to factors such as horizontal competition factors and market pricing levels, and thus has a stronger introverted characteristic. The benchmark interest rate method is to first select an appropriate benchmark interest rate,

and then consider the impact of the default risk premium and term risk premium; this pricing method has a strong market orientation, but often pays less attention to various costs required for loans, which may result in certain risk exposure.

In this context, this paper innovatively proposes the use of a combined framework of digital twins and reinforcement learning for risk pricing of commercial bank loans. The study selected real data from a branch of a national joint-stock commercial bank to construct a digital twin simulation environment for three different loan types: mortgage loans, consumer loans and personal loans, and used the Deep Deterministic Policy Gradient (DDPG) method to determine the best interest rate in order to help commercial banks improve their loan risk pricing capabilities.

2.2 Data Understanding

For specific loan business scenarios and corresponding market conditions, it is first necessary to conduct an in-depth analysis of the influencing factors, and then construct a simulation environment for commercial banks under different conditions. Through research, it can be seen that the factors that affect the simulation environment of commercial bank loan pricing mainly include capital cost, degree of loan risk, loan term, loan amount, degree of competition in the lending market, macroeconomic factors, etc. This paper extracts statistical data and factor data including branch interest rates from January 2010 to March 2022, loan conditions and non-performing conditions at different interest rate levels, one-year LPR, five-year LPR, GDP, CPI index, CSI 1000 index, three-month SHIBOR, one-year SHIBOR, M2 money supply, cumulative city-wide GDP, cumulative city-wide GDP growth, electricity consumption (financial, real estate, business and resident services industries), cumulative total retail sales of consumer goods, cumulative personal income tax, and cumulative rural and urban per capita disposable income, covering three major categories of economic indicators including macro, industry and region.

2.3 Construction of Digital Twin Simulation Environment Model

The simulation construction of the digital twin environment mainly involves two

modules: loan supply model construction and credit risk model construction. In terms of the loan supply model, this paper uses the XGBoost model to build models for three specific loan businesses: mortgage loans, consumer loans and personal loans. During the modeling process, considering that risk shocks will affect the overall supply of commercial bank loan projects in the market, the model simulated the relationship between interest rate pricing and the total loan amount at this interest rate, i.e., the customer supply of different businesses under different time periods and different interest rate pricing, thus building a supply model in the simulation environment. The model constructed in this paper can automatically explore the relationship between factors. The research results show that although the weights of factors in supply models of different loan types are different, the most important influencing factor is the lending interest rate.

In terms of the credit risk model, since external macro and micro factors will also affect the credit risk of commercial bank loan customers, macro and micro factors are also selected as explanatory variables when modeling. The data includes bank-related statistics and macroeconomic factors such as CPI, CSI 1000 Index, one-year and five-year LPR, and combined with the bank's own loan policy and pricing situation, the model simulates the relationship between interest rate pricing and the non-performing rate at that interest rate, i.e., the credit risks of customers of different businesses under different time periods and different interest rate pricing, thereby building a credit risk model in the simulation environment. At the same time, the model optimizes some abnormal situations, so that when the interest rate is very low or very high, the non-performing rate can be consistent with the highest non-performing rate in history.

2.4 Deep Reinforcement Learning Model Construction

This paper makes adaptive improvements to the DDPG model in deep reinforcement learning, transforming the original algorithm part aimed at discrete decision space into one for continuous decision space, and using the Monte Carlo simulation method to replace the original “temporal difference

learning” mechanism. Combining the actual situation of commercial bank mortgage loans, consumer loans and personal loans, this paper focuses on the total default rate and total income of different loan businesses, and takes this as the optimization objective of reinforcement learning, i.e., to ensure that commercial banks can optimize various indicators as much as possible under the premise of meeting the operational indicator regulatory requirements, so as to reduce the default rate while increasing the total income.

The algorithm flow chart of the reinforcement learning model used in this paper is as follows:

1. Randomly initialize network, network, network and network parameters; initialize the experience pool
2. In each simulation round, loop:
 - 2.1 Initialize the environment and obtain the initial state.
 - In each decision round, loop:

- 2.2 Calculate the decision, $a = \mu(s) + N$, where N is random noise following a normal distribution;

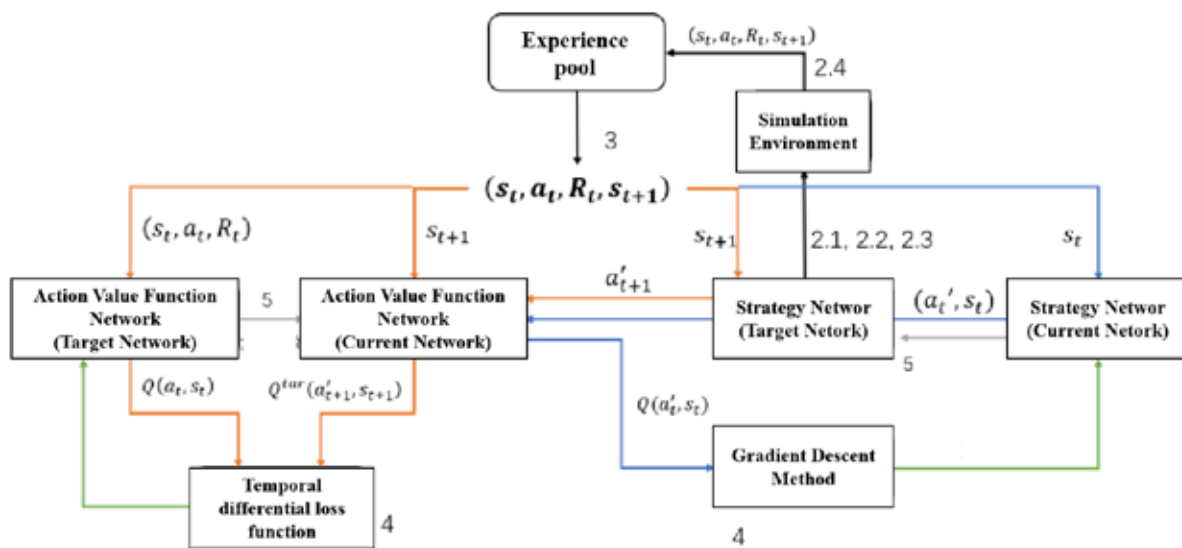
- 2.3 Interact with the environment to obtain the current round’s reward and the information of the next round’s environmental state;

- 2.4 Store the quadruple in the experience replay pool, and when the experience pool is full, clear and train the network.

3. Sample a batch of training samples uniformly from the experience replay pool, and update the parameters of the AC network according to the parameter update formula, and periodically perform soft updates on the target network of the AC.

4. When the non-performing rate and income output by the simulation model exceed the non-performing rate and income under the bank’s pricing, the training can be stopped.

Figure 1. DDPG Algorithm Model Framework



2.5 Experimental Results Analysis

This paper selects the data from December 2020 to February 2022 as the test set, based on the constructed commercial bank digital twin simulation environment, and uses the deep reinforcement learning framework to give the agent the optimal risk pricing for different loan businesses at different time stages in commercial banks, and outputs the different loan business total income results and

bank loan total non-performing rate results produced by the agent’s pricing strategy and the commercial bank expert strategy. Among them: the red line represents the strategy results output by reinforcement learning, and the blue line represents the actual pricing situation of the commercial bank.

As shown in Figure 2 and Figure 3:

Figure 2. Agent Strategy vs. Commercial Bank Strategy Results (Total Loan Income)

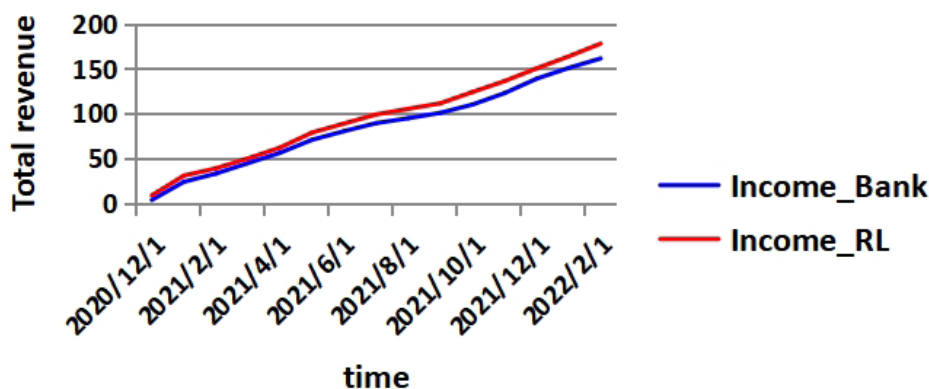
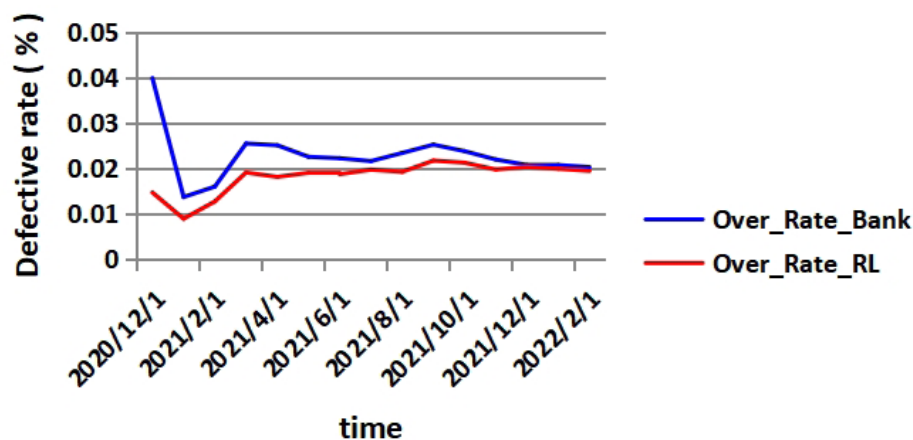


Figure 3. Agent Strategy vs. Commercial Bank Strategy Results (Non-performing Rate)



As shown in Figure 2, with the continuous development of the bank’s loan business, in different risk scenarios, both the agent and the expert strategies have given corresponding pricing strategies for different loan products. Due to the continuous accumulation of bank income, the total income generated by the agent’s decisions and the expert strategy results will continue to increase over time. Moreover, at different time points, the total accumulated loan income generated by the agent’s strategy is significantly higher than the expert decision result, and the difference between these two strategies is also constantly increasing, fully demonstrating that the interest rate pricing strategy given by the agent is significantly better than the current human expert strategy. This also further proves that within the observed time window, the agent can continuously optimize the pricing strat-

egy according to the market conditions, so that the allocation of loan resources in the market is more reasonable and effective.

III. Conclusion

This paper has constructed a simulation environment for the mortgage loan, consumer loan and personal loan business of a certain region of commercial banks based on digital twin technology, and used deep reinforcement learning technology for this scenario to give the bank’s risk pricing strategy that maximizes income under a certain non-performing rate threshold, achieving better results than the current human expert strategy. The relevant technology is not only applicable to the commercial bank risk pricing scenario, but also has a broad space for further migration to other fields in the financial industry.

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submitted 17.07.2024;
accepted for publication 12.06.2024;
published 26.06.2024
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Section 3. Chemistry

DOI:10.29013/ESR-24-5.6-30-33



THE INFLUENCE OF CERTAIN FUNCTIONAL GROUPS ON ADSORPTION PROCESSES AND MICELLE FORMATION IN AQUEOUS SOLUTIONS OF SURFACTANTS

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Cite: Derman S., Maryaskin Y.B., Maslak H., Netronina O. (2024). *The Influence of Certain Functional Groups on Adsorption Processes and Micelle Formation in Aqueous Solutions of Surfactants*. *European Science Review 2024, No 5–6*. <https://doi.org/10.29013/ESR-24-5.6-30-33>

Abstract

This work investigates the processes of adsorption and micelle formation in aqueous solutions of surfactants (SAS), which determine their technological properties. Through theoretical analysis based on a method proposed in the literature, the contribution of various functional groups to the change in Gibbs free energy of these processes was assessed. The results show that the change in free energy during micelle formation can be represented as the sum of changes in energy of the hydrophilic and hydrophobic components of the SAS molecules. A linear dependence between the change in free energy and the number of hydrocarbon groups was revealed, allowing the calculation of the energetic contribution of a single hydrocarbon group. The analysis showed no direct dependence between the number of hydrophilic groups and the change in free energy, indicating that only a certain portion of these groups integrate into the micelles. The study also emphasizes the difference in the technological properties of solutions when using anionic surfactants and offers a new understanding of the thermodynamic aspects of adsorption and micelle formation processes in aqueous solutions of molecular SAS.

Keywords: *surfactants, adsorption, micelle formation, Gibbs free energy, functional groups, hydrophilic and hydrophobic components, technological properties*

Introduction

Within the framework of studying aqueous solutions of surfactants (SAS), in which the key roles are played by the processes of

adsorption and micelle formation, determining their technological properties, an analytical work aimed at evaluating the contribution of functional groups to the reduction of

Gibbs free energy in these processes was conducted. The analysis is based on a method mentioned in sources (Lin I.J., Marszall L., 1978; Maryaskin Y., Derman S., 2019), which allows for a first approximation to represent the change in Gibbs free energy during micelle formation as the sum of changes in energy for the hydrophilic and hydrophobic components of the SAS molecules:

$$\Delta G_m^0 = \Delta G_m^{0,P} + \Delta G_m^{0,R}, \quad (1)$$

where ΔG_m^0 denotes the change in Gibbs free energy upon forming micelles from one mole of SAS, $\Delta G_m^{0,P}$ and $\Delta G_m^{0,R}$ respectively reflect the changes in Gibbs energy for the hydrophilic and hydrophobic parts of the molecules.

Research Part

In the context of the homologous series of SAS, the value of $\Delta G_m^{0,P}$ is considered a constant, while $\Delta G_m^{0,R}$ can be calculated as the change in free energy upon integrating one hydrocarbon group into the micelle ($\Delta G_m^{CH_2}$), considering the number of such groups in the molecule (n) and Avogadro's number (N_A).

From (1):

$$\Delta G_m^0 = \text{const} + n\Delta G_m^{CH_2} N_A, \quad (2)$$

From (2), it follows that in the coordinates $\Delta G_m^0 - f(n)$ a linear dependence should be observed, where the slope of the line allows for the calculation of the change in free energy upon transitioning one hydrocarbon group into the micelle, and the segment cut off on the ordinate axis corresponds to the value of $\Delta G_m^{0,P}$.

Table 1 presents the calculated values of ΔG_0 , $\Delta G_m^{0,P}$ and $\Delta G_m^{0,R}$ for a series of molecular SAS, using $\Delta G_m^{0,P}$ values from (Lin I.J., 1972).

The presented data indicate that all values of $\Delta G_m^{CH_2}$ are approximately the same (the average value of this magnitude is $-5.64 \cdot 10^{-21}$ J). This value of $\Delta G_m^{CH_2}$ was used in calculating $\Delta G_m^{0,R}$ for the studied SAS.

It should be noted that our value of $\Delta G_m^{CH_2}$ differs from those presented in (Maryaskin Y., Derman S., 2019; Maryaskin, Y.B., Danilov, F.I., 2004) for other classes of surfactant compounds. Likely, the nature of the hydrophilic parts of SAS affects the magnitude of this parameter.

Regarding the values of $\Delta G_m^{0,P}$, there is no correlation between the number of hydrophilic groups and the change in the system's

free energy. Likely, not all hydrophilic groups are integrated into the micelles, but only a certain part that ensures the maximum reduction of contact between the hydrocarbon radical and water. This limitation seems reasonable since the inclusion of hydrophilic groups in micelles is accompanied by an increase in Gibbs energy. Thus, the spontaneity of the micelle formation process in solutions of molecular SAS is conditioned by the fact that the absolute value of $\Delta G_m^{0,R}$ is greater than $\Delta G_m^{0,P}$.

It should also be noted that, unlike the solutions mentioned, the use of anionic SAS is accompanied by a decrease in the value of $\Delta G_m^{0,P}$. Possibly, this is one of the reasons for the difference in the technological properties of these solutions.

The assumption that the properties of SAS molecules are composed of the properties of their hydrophilic and hydrophobic parts can also be applied to the adsorption process. In this case:

$$\Delta G_a^0 = \Delta G_a^{0,P} + \Delta G_a^{0,R}, \quad (3)$$

where ΔG_a^0 – is the change in free energy upon adsorbing one mole of SAS; $\Delta G_a^{0,P}$ and $\Delta G_a^{0,R}$ – are the changes in free energy upon adsorbing the hydrophilic and hydrophobic parts of SAS, respectively.

For the homologous series of SAS, $\Delta G_a^{0,R}$ consists of the change in Gibbs free energy upon adsorbing one $-CH_2-$ group of the hydrocarbon chain, considering their number in the molecule (n) and the number of molecules in one g-mole of adsorbate, and $\Delta G_a^{0,P}$ is a constant magnitude:

$$\Delta G_a^0 = \text{const} + n\Delta G_a^{CH_2} N_A. \quad (4)$$

Values for the components of equation (4) are provided in Table 2. The calculations used of $\Delta G_a^{0,P}$ values from (Lin I.J., 1972).

From this table, it is evident that all values $\Delta G_a^{CH_2}$ are roughly the same (the average value of this magnitude is $-4.19 \cdot 10^{-21}$ J). This value $\Delta G_a^{CH_2}$ was used in calculating $\Delta G_a^{0,R}$ for the studied SAS.

Regarding the magnitude of $\Delta G_a^{0,P}$ – it is little dependent on the number of oxyethylene groups in the molecules of SAS. It can be assumed that approximately the same hydrophilic part of SAS molecules is placed at the phase boundary in all cases.

It is also worth noting that, unlike micelle formation, the adsorption of hydrophilic

groups of the studied SAS molecules is accompanied by a reduction in Gibbs free energy. This fact is what makes the adsorption process more thermodynamically favorable than micelle formation from a thermodynamic point of view.

Furthermore, it was shown in (Maslak, H. S., Maryaskin, 2023) that at the critical micelle concentration, the number of molecules that formed micelles is greater than those absorbed on the surface. There, it was also suggested that the presence of micelles in the solution volume might act as a barrier, hindering the delivery of molecules to the phase boundary, which affects the technological properties of SAS solutions.

Conclusions

Thus, through the conducted study, the contribution of functional groups to the change in Gibbs free energy during adsorption and micelle formation in aqueous solutions of surfactants was assessed.

The analysis demonstrated that the change in free energy during micelle forma-

tion can be represented as the sum of changes in energy for the hydrophilic and hydrophobic parts of SAS molecules. The obtained data indicate a linear dependency between the change in free energy and the number of hydrocarbon groups in the molecule, confirming the significance of hydrophobic interactions in the process of micelle formation.

It was also established that the magnitude of the change in free energy for hydrophilic groups does not show a direct correlation with their number, indicating the selective inclusion of these groups into micelles. The results emphasize the thermodynamic advantage of adsorption compared to micelle formation and suggest that the presence of micelles in the solution might affect the technological properties of SAS by limiting the delivery of molecules to the phase boundary.

Thus, the study provides new insights into the thermodynamic aspects of SAS behavior in aqueous solutions, important for understanding and optimizing their technological applications.

Table 1. Values of $\Delta G_m^{CH_2}$, $\Delta G_m^{O,R}$ and $\Delta G_m^{O,P}$ for molecular surfactants ($T=298$)

Surfactant formula	Dependency equation $\Delta G_m^0 - f(n)$	$\Delta G_m^{CH_2} * 10^{21}$, J	$\Delta G_m^{O,R} * 10^{-3}$, J/mol	$\Delta G_m^{O,P} * 10^{-3}$, J/mol
$C_8H_{17}O(C_2H_4O)_3H$			-27.16	
$C_{10}H_{21}O(C_2H_4O)_3H$	$\Delta G_m^0 = 1850 - 3210n$	- 5.33	-33.95	1.85
$C_{12}H_{25}O(C_2H_4O)_3H$			-40.74	
$C_8H_{17}O(C_2H_4O)_6H$			-27.16	
$C_{10}H_{21}O(C_2H_4O)_6H$	$\Delta G_m^0 = 6960 - 3510n$	-5.83	-33.95	6.96
$C_{12}H_{25}O(C_2H_4O)_6H$			-40.74	
$C_8H_{17}O(C_2H_4O)_8H$			-27.16	
$C_{12}H_{25}O(C_2H_4O)_8H$	$\Delta G_m^0 = 7569.3 - 3509.6n$	-5.83	-40.74	7.57
$C_{14}H_{29}O(C_2H_4O)_8H$			-47.53	
$C_8H_{17}O(C_2H_4O)_{10}H$			-27.16	
$C_{10}H_{21}O(C_2H_4O)_{10}H$	$\Delta G_m^0 = 6060 - 3280n$	-5.45	-33.95	6.06
$C_{12}H_{25}O(C_2H_4O)_{10}H$			-40.74	
$C_{14}H_{29}O(C_2H_4O)_{10}H$			-47.53	
$C_8H_{17}O(C_2H_4O)_{12}H$			-27.16	
$C_{10}H_{21}O(C_2H_4O)_{12}H$	$\Delta G_m^0 = 6933 - 3375.5n$	-5.61	-33.95	6.93
$C_{12}H_{25}O(C_2H_4O)_{12}H$			-40.74	
$C_{14}H_{29}O(C_2H_4O)_{12}H$			-47.53	
$C_8H_{17}O(C_2H_4O)_{14}H$			-27.16	
$C_{12}H_{25}O(C_2H_4O)_{14}H$	$\Delta G_m^0 = 9280 - 3480n$	-5.78	- 40.74	9.28
$C_{14}H_{29}O(C_2H_4O)_{14}H$			- 47.53	

Table 2. Values of $\Delta G_a^{CH_2}$, $\Delta G_a^{0,R}$ and $\Delta G_a^{0,P}$ for molecular surfactants ($T=298$)

Surfactant formula	Dependency equation $\Delta G_a^0 - f(n)$	$\Delta G_a^{CH_2} * 10^{21}$, J	$\Delta G_a^{0,R} * 10^{-3}$, J/mol	$\Delta G_a^{0,P} * 10^{-3}$, J/mol
$C_8H_{17}O(C_2H_4O)_3H$			-20.18	
$C_{10}H_{21}O(C_2H_4O)_3H$	$\Delta G_a^0 = -21547 - 2375n$	-3.94	-25.22	-21.55
$C_{12}H_{25}O(C_2H_4O)_3H$			-30.27	
$C_8H_{17}O(C_2H_4O)_6H$			-20.18	
$C_{10}H_{21}O(C_2H_4O)_6H$	$\Delta G_a^0 = -20258 - 2437.5n$	-4.05	-30.27	-20.26
$C_{12}H_{25}O(C_2H_4O)_6H$			-35.31	
$C_8H_{17}O(C_2H_4O)_8H$			-20.18	
$C_{12}H_{25}O(C_2H_4O)_8H$	$\Delta G_a^0 = -15371 - 2854.6n$	-4.74	-30.27	-15.37
$C_{14}H_{29}O(C_2H_4O)_8H$			-35.31	
$C_8H_{17}O(C_2H_4O)_{10}H$			-20.18	
$C_{10}H_{21}O(C_2H_4O)_{10}H$	$\Delta G_a^0 = -20149 - 2546n$	-4.23	-25.22	-20.15
$C_{12}H_{25}O(C_2H_4O)_{10}H$			-30.27	
$C_{14}H_{29}O(C_2H_4O)_{10}H$			-35.31	
$C_8H_{17}O(C_2H_4O)_{12}H$			-20.18	
$C_{10}H_{21}O(C_2H_4O)_{12}H$	$\Delta G_a^0 = -18716 - 2591.5n$	-4.30	-25.22	-18.72
$C_{12}H_{25}O(C_2H_4O)_{12}H$			-30.27	
$C_{14}H_{29}O(C_2H_4O)_{12}H$			-35.31	
$C_8H_{17}O(C_2H_4O)_{14}H$			-20.18	
$C_{12}H_{25}O(C_2H_4O)_{14}H$	$\Delta G_a^0 = -21730 - 2325n$	-3.86	-30.27	-21.73
$C_{14}H_{29}O(C_2H_4O)_{14}H$			-35.31	

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submitted 17.07.2024;

accepted for publication 12.06.2024;

published 26.06.2024

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Section 4. Linguistics

DOI:10.29013/ESR-24-5.6-34-40



A FEMINIST STYLISTIC ANALYSIS OF THE GOD OF SMALL THINGS

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Cite: *Ying Wu. (2024). A Feminist Stylistic Analysis of The God of Small Things. European Science Review 2024, No 5–6. <https://doi.org/10.29013/ESR-24-5.6-34-40>*

Abstract

Arundhati Roy's work *The God of Small Things* is a book about love and loss. The characters in the work desire love and pursue it, but due to the caste system and the so-called law of love in Indian society at that time, these loves end in tragedy. This paper takes a feminist stylistic perspective on this novel, analyzing the oppression of women in a patriarchal society in terms of lexical, phraseology, and discourse.

Keywords: *feminist stylistic, gender inequality, the God of Small Things*

Introduction

The God of Small Things is a post-colonial novel published in 1997 by the acclaimed Indian author Arundhati Roy. The *Financial Times* once called it "A gripping tale of love and loss, moored in anguish but told with compelling wit, eroticism and consummate tenderness". Beginning with the funeral of their cousin Sophie Mol, *The God of Small Things* tells the tortuous childhood experiences of twin siblings Rahel and Estha in a small village in southern India, revealing the secret of the love between their mother Ammu and the carpenter Velutha, and how, in this socially hierarchical environment, the two children were inadvertently induced to participate in the destruction of this poignant love, and paid a heavy price for it. The book draws out the humility and suffering of a family, and even a nation, through the

lives of twins, with a deep, ancient, tearful sadness flowing between the lines. Through a multi-faceted narrative approach, the author clearly outlines two story lines spanning several decades, presenting a family history full of trivial details and full of tragedy.

Feminist Stylistics

Since the rise of feminism in the 1960s, most feminists have argued that women as a group have been oppressed and treated differently from men, and have endured discrimination from individuals and institutions. Western feminist stylistic studies are the product of a combination of feminist theory and several branches of linguistic theory, particularly critical linguistics and critical discourse analysis theory. In order to analyze the hidden gender roles and gender identities in language, Sara Mills published the book *Feminist Stylistics* in

1995, with the aim of drawing attention to the ways in which gender is presented and, hopefully, changing them.

She mainly analyzes the gender differences in the text from the three levels, the first is gender differences at the lexical level, such as the use of male and female personal pronouns, the misuse of generic pronouns and referents, the choice of positive and negative words for men and women, and the taboo words for men and women; the second is gender connotations at the phrase and sentence level, where words are placed in specific contexts to investigate their meanings. The third is gender tendency at the level of discourse, inquiring into the construction of the text through the discourse codes inside and outside the text. For example, the portrayal of male and female characters, the difference in the representation of male and female status, and the narrative style of male and female characters.

Through the analysis of the above three aspects, it shows the oppression and discrimination suffered by women due to the unequal social status, and makes readers re-examine the text from the perspective of gender.

The God of Small Things made a huge impact as a Booker Prize-winning book. However, the current research on it mainly analyzes it from the perspective of post-colonialism (Zhao, 2017), trauma narrative (Feng, 2022; Yu, 2016) and spatial narrative (Li, 2015). However, at present, there are no articles from the perspective of feminist stylistics to deeply explore the power inequality between men and women reflected in the lexical, phrase and discourse of this novel.

Lexical Level of Interpretation

Feminist stylistics argues that masculinity is largely used as the norm in language. For example, the full pronoun he and the full noun man can themselves refer to both males and all humans. But people rarely think of women when they use these terms. Mills (1995) argues that the description of women as someone's wife makes them subordinate to their husband and in a marked position. This narrative is more commonly accepted, and thus women are invariably at a disadvantage compared to men. This is very evident in this article. (The example sentences selected

for this article are all from Arundhati Roy's novel *The God of Small Things*, published in 1997, and are therefore followed only by the page numbers.) There are many women who appear in the novel, including Ammu, Rahel, Mammachi, Baby Kochamma, Levin's wife Kalyani, and so on. Through the descriptions in the article we can see how the use of vocabulary puts the female characters in a subordinate position.

(1): She was Rahel's baby grandaunt, her grandfather's younger sister. Her name was really *Navomi*, Navomi Ipe, but everybody called her Baby. She became Baby Kochamma when she was old enough to be an aunt (p 2).

(2): The Loss of Sophie Mol stepped softly around the Ayemenem House like a quiet thing in socks. It hid in books and food. In Mammachi's violin case. In the scabs of the sores on Chacko's shins that he constantly worried. In his slack, *womanish* legs (p 15).

(3): Though Ammu did as much work in the factory as Chacko, whenever he was dealing with food inspectors or sanitary engineers, he always referred to it as *my* Factory, *my* pineapples, *my* pickles. Legally this was the case, because Ammu, as a daughter, had no claim to the Property (p 57).

(4): They looked cheerful in the photographs, Lenin and *his wife*. As though they had a new refrigerator in their drawing room, and a down payment on a DDA flat (p 131).

(5): They were all there the deaf amoomas, the cantankerous, arthritic apoopans, the pining *wives*, scheming uncles, children with the runs. The fiancées to be reassessed. The teacher's husband still waiting for his Saudi visa. The teacher's husband's *sisters* waiting for their dowries. The wire-bender's pregnant *wife* (p 138).

Example 1 is the only place in the entire article to introduce the baby Kochamma's real name, she has her own name Navomi Ipe, but no one called her so, everyone called her baby, and she herself is accustomed to this situation, and did not ask others must be called his real name, indicating that this character actually does not have a strong sense of self. The key word in example 2 is "womanish". Chuck is the adult male in the family, and he is obese. The passage describes Chuck's obese and flabby calves, but the author intriguingly chooses the word "womanish". It seems to make the

flabby calves the preserve of women, but it has nothing to do with men and women, but with excessive obesity. But it is this choice of wording that further illustrates the important impact of lexical choice. This simple word can be seen in the fact that perhaps the words associated with women in this novel can have a certain negative undertone. Example 3 reveals the current situation of Indian society at that time. The husband Ammu married was not a good one, but after Ammu married, she still needed to take her husband's surname, and could only choose to change back to her father's surname after divorce, with no autonomy for the woman. In feudal China, women were also required to take their husband's surname after they married, which fully reflects the current situation of Indian society where women were dependent on men for survival. Example 4 This dialogue occurs when Pillai introduces Rahel to others. Pillai introduces Rahel not in terms of Rahel herself, but must place her in a subordinate position, whose "granddaughter" Rachael is. Instead of being an independent individual. Examples 5 illustrate that women many times do not even have their own names. They usually appear as the wife, sister or fiancée of some man, etc. Men, on the other hand, appear mostly independently. Feminist stylistics holds that women are generally considered to be variations on the male norm and are usually specifically marked. Yuan (2019) argues that it seems that to outsiders, women were more of an appendage of men and did not even have the possibility to exist by their own names, from which the absolute dominance of men over women at that time can be seen.

In this novel, female characters are generally looked down upon and made subordinate to male characters. The saddest thing is that it is not only men who cause oppression to women, but there is even oppression among women. Baby Kochamma was once a brave rebel, but after her failed courtship, she gradually accepted her fate. When she learned that Ammu actually dared to have sex with the untouchable Velutha, she immediately hated them and wanted to kill Velutha. Although Ammu has a certain sense of rebellion, she does not succeed in getting together with her beloved one under the social system of male superiority and female inferiority in India at that time.

Phraseology Level of Interpretation

Feminist stylistics often use Halliday's systemic theory of language and transitivity in their analysis of texts (Zhang, 2016). In his book *Language Function and Literary Style*, Halliday mentions that there are three kinds of meta-functions of language: conceptual, interpersonal, and discourse functions (Halliday, 1971). Among them, the conceptual function refers to the function of language to express people's experiences in the real world. The tangent is a semantic system that expresses the conceptual function. It serves to divide what people see, hear, and do in the real world into several processes and to specify the "participants" and "environmental components" associated with each process (Hu et al., 1989). Sara Mills (1995) argues that material selection involves "the extent to which the character is a passive victim of the environment, or the extent to which the character actively controls the environment, makes decisions, and takes action". By drawing on functional stylistic theories of object analysis, feminism can not only understand women's actions, internal thoughts, and the environment involved in the language process, but also provide insight into how women are oppressed and discriminated against. Therefore, in this paper, we will analyze three fragments of the text and their materiality at the level of material processes to reveal the power relations between men and women.

(6): Pappachi would not help her with the pickle-making because he did not consider pickle-making a suitable job for a high ranking ex-Government official. He had always been a jealous man, so he greatly resented the attention his wife was suddenly getting. He *slouched* about the compound in his immaculately tailored suits, *weaving* sullen circles around mounds of red chilies and freshly powdered yellow turmeric, *watching* Mammachi supervise the buying, the weighing, the salting and drying, of limes and tender mangoes. Every night he *beat* her with a brass flower vase. The beatings weren't new. What was new was only the frequency with which they took place. One night Pappachi *broke* the bow of Mammachi's violin and *threw* it in the river (p 29).

(7): On one such night, Ammu, aged nine, *hiding* with her mother in the hedge, *watched*

Pappachi's natty silhouette in the lit windows as he flitted from room to room. Not content with *having beaten* his wife and daughter (Chacko was away at school), he *tore down* curtains, *kicked* furniture and *smashed* a table lamp. An hour after the lights went out, disdaining Mammachi's frightened pleading, little Ammu *crept* back into the house through a ventilator to rescue her new gumboots that she loved more than anything else. She *put* them in a paper bag and *crept* back into the drawing room when the lights were suddenly switched on. Pappachi had been *sitting* in his mahogany rocking chair all along, *rocking* himself silently in the dark. When he *caught* her, he didn't *say* a word. He *flogged* her with his ivory-handled riding crop (the one that he had held across his lap in his studio photograph). Ammu didn't *cry*. When he finished *beating* her he made her bring him Mammachi's pinking shears from her sewing cupboard (p 181).

(8): "Ammukutty... what is it –" She *went* to him and laid the length of her body against his. He just *stood* there. He didn't *touch* her. He was *shivering*. Partly with cold. Partly terror. Partly aching desire. Despite his fear his body was prepared to take the bait. It wanted her. Urgently. His wetness wet her. She *put her arms around him*.

He tried to be rational. What's the worst thing that can happen?

I could lose everything. My job. My family. My livelihood. Everything. She could hear the wild hammering of his heart. She *held* him till it calmed down. She *unbuttoned* her shirt. They stood there. Skin to skin. Her brownness against his blackness. Her softness against his hardness. Her nut-brown breasts (that wouldn't support a toothbrush) against his smooth ebony chest. She *smelled* the river on him. His Particular Paravan smell that so disgusted Baby Kochamma. Ammu *put out* her tongue and *tasted* it, in the hollow of his throat. On the lobe of his ear. She *pulled* his head down toward her and kissed his mouth. A cloudy kiss. A kiss that demanded a kiss-back. He *kissed* her back (p. 334).

Example 6 is mainly a description of how Pappachi got along with Mammachi when he was still alive. There are six material processes in this example. A material process is the process of doing something. The materi-

al process usually consists of an actor and a target, and can reflect the actor's control and influence on the objective world. Of these six material processes, two of the actions are used to describe Pappachi's own state, two to describe Pappachi's beating of Mammachi, and two to describe Pappachi's breaking of Mammachi's violin. The target of Pappachi's material processes, other than his own state, is Mammachi and Mammachi's beloved objects. Pappachi is a respectable government official on the outside, but he comes home and beats his wife wantonly. We know from the novel that Mammachi is actually a very capable woman who plays the violin very well and runs a factory all by herself. But this is also the root cause of her beatings by Pappachi's. Her excellence challenged Pappachi's self-esteem and authority as a man. Example 7 is a description of the current situation of Ammu and Pappachi's life at home. This has a total of 16 material processes, of which Ammu emits 6 actions and Pappachi emits 8 actions. Mammachi is not the only one at home who suffers beatings from Pappachi; little nine-year-old Ammu is also not immune. Ammu's actions all happened when she tried to take out her rubber boots after the beating. She had to sneak into the house and was caught by Pappachi, who rightfully beat up Ammu again, and not only that, but also cut up Ammu's beloved rubber boots. From these two descriptions we can see Pappachi's absolute leadership in this household. He can beat his wife and children at will and dispose of their belongings at will. This reflects the low status of women in India and the hardships of their lives. The Pappachi family was a Brahmin class, and the living conditions of women in even lower caste families were only more difficult. But the situation in Example 8 is a little different, because Example 8 depicts the relationship between Ammu and Velutha. There are 12 material processes in this example, of which Ammu dominates 8 actions, while Velutha dominates only 4 actions. We can see that Ammu is clearly dominant during the relationship between Ammu and Velutha. But the reason for this was not the sudden improvement in the status of women in India, but the deep-rooted caste system in India, where Velutha's status as a Dalit was extremely low.

From the phraseology level interpretation we can see that although women may also dominate the action in the novel, this dominance is also limited by caste. In general, this reflects the lack of control of women over their surroundings and events in the context of a patriarchal society, where women are always bound to domestic chores and live under the shadow of male violence.

Discourse Level of Interpretation

Mills (1995) notes that male characters tend to be depicted in costume and body parts, while female characters are depicted with sexual connotations. In the depiction of male characters, the point of view is face-to-face contact with the male, while female characters are described as objects of gaze, especially the male gaze. The descriptions of males and females in *The God of Small Things* fit this point, so this paper selects six fragments of this novel that describe the appearance of women and men as examples.

(9): “It’s a little too late for all this, don’t you think?” he said. He spoke the coarse Kottayam dialect of Malayalam. He stared at Ammu’s breasts as he spoke. He said the police knew all they needed to know and that the Kottayam Police didn’t take statements from veshyas or their illegitimate children. Ammu said she’d see about that. Inspector Thomas Mathew came around his desk and approached Ammu with his baton. “If I were you,” he said, “I’d go home quietly.” Then he tapped her breasts with his baton. Gently. Tap tap. As though he was choosing mangoes from a basket. Pointing out the ones that he wanted packed and delivered. Inspector Thomas Mathew seemed to know whom he could pick on and whom he couldn’t. Policemen have that instinct (p. 7).

(10): On other days she had deep dimples when she smiled. She had a delicate, chiseled face, black eyebrows angled like a soaring seagull’s wings, a small straight nose and luminous, nut-brown skin. On that sky-blue December day, her wild, curly hair had escaped in wisps in the car wind. Her shoulders in her sleeveless sari blouse shone as though they had been polished with a high-wax shoulder polish. Sometimes she was the most beautiful woman that Estha and Rahel had ever seen. And sometimes she wasn’t (p. 45).

(11): She was a lush, beautiful woman with golden-brown skin and huge eyes. Her long frizzy hair was damp and hung loose down her back, plaited only at the very end. It had wet the back of her tight, deep-red blouse and stained it a tighter, deeper red. From where the sleeves ended, her soft arm-flesh swelled and dropped over her dimpled elbows in a sumptuous bulge. Her white mundu and kavath were crisp and ironed. She smelled of sandalwood and the crushed green gram that she used instead of soap. For the first time in years, Chacko watched her without the faintest stirring of sexual desire. He had a wife (Ex-wife, Chacko!) at home. With arm freckles and back freckles. With a blue dress and legs underneath (p. 270).

(12): He was a small man, but well built. Pleasant-looking. He wore old-fashioned spectacles that made him look earnest and completely belied his easygoing charm and juvenile but totally disarming sense of humor. He was twenty-five and had already been working on the tea estates for six years (p. 39).

(13): In the only photograph they had seen of him (which Ammu allowed them to look at once), he was wearing a white shirt and glasses. He looked like a handsome, studious cricketer. With one arm he held Estha on his shoulders. Estha was smiling, with his chin resting on his father’s head. Rahel was held against his body with his other arm. She looked grumpy and bad-tempered, with her baby legs dangling. Someone had painted rosy blobs onto their cheeks (p. 84).

(14): It was the summer of his final year at Oxford. He was alone. His rumpled shirt was buttoned up wrong. His shoelaces were untied. His hair, carefully brushed and slicked down in front, stood up in a stiff halo of quills at the back. He looked like an untidy, beatified porcupine. He was tall, and underneath the mess of clothes (inappropriate tie, shabby coat) Margaret Kochamma could see that he was well-built. He had an amused air about him, and a way of narrowing his eyes as though he was trying to read a faraway sign and had forgotten to bring his glasses. His ears stuck out on either side of his head like teapot handles. There was something contradictory about his athletic build and his disheveled appearance. The only sign that a

fat man lurked inside him was his shining, happy cheeks (p. 241).

Of the six examples above, the first three are descriptions of female appearance in the book, while the last three are descriptions of male figures in the book. In Example 9, Ammu went to the police station, but was belittled by the police and had to baton Amu on the breast, even more than once. The description in Example 10 illustrates that Ammu is a very beautiful woman, but this description is full of sexual connotations, fully describing Ammu's beautiful face, silky skin and beautiful shoulders. It shows that Amu is very attractive to men. Example 11 shows Chacko's examination of Lenin's wife, Kalyani, as Chacko stares at someone else's wife's hair, tight blouse, and the flesh on her arms. The latter also mentions that this is the first time Chacko has not had sexual urges towards her, indicating that Chuck used to have sexual urges towards Kalyani on a regular basis. The last three examples of Rahel's father and Chacko's descriptions are much more ordinary, with the author just routinely describing their dress, body type and condition without the slightest hint of sexual innuendo. The depiction of men in this way is basically a face-to-face, holistic portrayal, which not only does not have any sexual connotation, but also shows a strong sense of male manhood. Therefore, in the depiction of the discourse, women are also in a position of dependence on men and their individuality is very weak (Hu, 2014).

Although the women in the novel play important roles and contribute much to their families, they still cannot escape being sexually harassed and gazed at by men. Moreover, the women in the novel, after being oppressed, except for Ammu who bravely resists, Mammachi and Baby Kochamma instead begin to persecute women. Mammachi refers to the women workers who had sex with her son as prostitutes, and even opened a back door for Chacko to hang out with these women. Even Chacko's ex-wife is not spared, and Mammachi sees any woman who approaches her son as an enemy. She secretly stuffs money into Margaret's clothes as a way to comfort herself that Margaret is also a prostitute. It is a tragedy that women live

in such a low-pressure and abusive environment for a long time.

Conclusion

The above analysis reveals that the interpretation of *The God of Small Things* with the help of feminist stylistic theory can reveal more objectively the phenomenon of sexism in the novel and the oppression of women in the male-dominated society. In terms of lexical, the use of positive and negative words reflects the sexism and inequality between men and women in the language; the use of appellatives reflects the subordinate status of women in society, and women are not even allowed to have their own names in many cases, and are forced to become the appendages of men.

At the phraseology level, the analysis of objectivity reveals the unequal power relationship between male and female characters, with men in a dominant position and women in a passive and vulnerable position. At the level of discourse, the novel portrays two different kinds of women, those who have adapted to the suffocating environment like Mammachi and Baby Kochamma and become the defenders of the patriarchal system in turn, and those new women with the spirit of resistance who fail to escape the domination of the patriarchal society and achieve their own liberation. Like Ammu in the book, she bravely falls in love with the "untouchable" Velutha and has sex with him. However, due to the social environment at that time, Amu is not destined to be happy, so at the end of the article, Velutha dies quite tragically and Amu also dies alone of illness. From these three levels of analysis, we can see the oppression of women by men and the difficult situation of women in a society where men are superior to women.

Conflict of Interest

The authors declare no conflict of interest.

Acknowledgment

The author of this paper is very grateful to the Northwestern Polytechnical University teachers for their guidance. Special thanks to my tutor Professor Liu.

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submitted 17.07.2024;
accepted for publication 05.04.2024;
published 19.04.2024
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Section 5. Psychology

DOI:10.29013/ESR-24-5.6-41-49



PHILOSOPHICAL ISSUES OF POVERTY: SOCIAL, ETHICAL, AND POLITICAL ASPECTS

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Cite: *Jumayev O.M. (2024). Philosophical Issues of Poverty: Social, Ethical, and Political Aspects. European Science Review 2024, No 5–6. <https://doi.org/10.29013/ESR-24-5.6-41-49>*

Abstract

This article examines poverty as one of the most acute and pressing issues in contemporary society. It discusses measures to mitigate the factor that poses a dangerous impact on economic and technological progress. The research analyzes the phenomenon of poverty through the philosophical lens, focusing on its social, ethical, and political dimensions. The article considers poverty as a multifaceted philosophical issue, exploring its social, ethical, and political aspects. It reviews the perspectives of philosophers, economists, sociologists, and other scholars, investigating the historical and contemporary theoretical viewpoints on poverty. Additionally, it delves into the complex nature of poverty, identifying both social and natural conditions and highlighting the interconnections between these factors in its formation and persistence.

Poverty is deeply rooted in social structures and inequalities influenced by economic conditions, educational opportunities, healthcare, and social justice. These social factors are crucial for understanding the persistence of poverty across different historical periods and societies. The ethical analysis of poverty includes examining moral responsibilities towards the poor and society's obligations. This involves discussions on human rights, social justice, and the moral imperatives for eradicating poverty through fair distribution of resources and opportunities. The political aspect of poverty considers the role of governance, policy-making, and state intervention in alleviating poverty. The study critiques various political systems and policies, assessing their effectiveness in eliminating poverty and ensuring social equality.

The article identifies a significant gap in existing literature regarding the natural conditions of poverty, such as environmental factors and geographical conditions. It emphasizes the need to integrate these aspects with social factors to form a comprehensive understanding of poverty. The article proposes a new definition of poverty as a complex social phenomenon characterized by a lack of material and spiritual resources necessary to meet human needs. This definition includes social and natural conditions as well as the mechanisms of poverty formation and proliferation. By integrating social, ethical, and political analyses, the article provides a holistic view of poverty, offering insights into its root causes and proposing multifaceted strategies for

alleviation. It calls for a more inclusive approach that encompasses both social and natural aspects of poverty to create effective and sustainable solutions.

Keywords: *poverty, “new poor,” “philosophy of poverty,” inequality, philosophical concept of poverty, cyclical poverty, philosophical lens*

Introduction

When the phenomenon of poverty is studied from a socio-philosophical perspective, it necessitates a deeper analysis of its essence, content, and various forms as a result of the interaction of many processes inherent in human existence. Regardless of the stage of development, every society encompasses poverty as one of its fundamental aspects. In today’s post-industrial information society, the nature of poverty has evolved to include new qualitative indicators. Poverty now manifests not only in material deprivation but also in the spiritual dimensions of human existence.

A specific issue is the emergence of the “new poor,” i.e., skilled professionals who are either unemployed or earning low wages. A comprehensive analysis of the problem of the “new poor” indicates that its solution must be sought within the complex deterministic relationships between economic, social, political phenomena, and the processes of human and societal development, including values and value systems.

The concept of “poverty” still lacks a precise scientific interpretation. Political framing of the essence of poverty and accepting it solely as an economic phenomenon does not contribute to the development of a national strategy to combat this issue.

Typically, government approaches to addressing poverty problems are based on economic methods. However, the use of such methods, as social-historical practice shows, not only fails to solve the problem but also does not always lead to a reduction in poverty. Understanding the socio-philosophical issues of the poverty phenomenon as a catastrophic state affecting all levels of sociality, deprived of one or more components – economic, spiritual, moral – of the individual, society, and human civilization’s social values, contributes to their effective resolution.

This research begins with several considerations and reflections on the social philosophy of poverty. It examines the social aspects of poverty, such as inequality, social exclusion,

and the structural causes of poverty. The study analyzes how certain social mechanisms support and exacerbate poverty in society and how poverty influences social relations and the overall dynamics of society. Additionally, it addresses the ethical dimensions of poverty and the related moral issues. Various ethical principles applicable to the problem of poverty, including justice, social responsibility, and human rights, are discussed. The ethical obligations of society and individuals towards the poor, and the moral aspects of actions to combat poverty, are analyzed.

In the political philosophy of poverty, the role of the state and policy towards poverty, anti-poverty policies, and social programs, as well as their effectiveness and moral foundations, are examined. The political principles and values guiding the development of social policies and programs aimed at reducing poverty are also discussed.

Research Methodology

The philosophical problem of poverty and its social, ethical, and political aspects are scientifically and theoretically analyzed based on various perspectives and approaches. Additionally, the essence of the related reflections and analyses is explored more broadly through philosophical analysis.

The methodology includes the following key components:

- General information on literature sources;
- Literature review: an extensive examination of existing literature on poverty from philosophical, social, ethical, and political perspectives.

This involves collecting books, academic journals, articles, and various viewpoints to create a theoretical foundation. Qualitative research methods such as interviews, focus groups, and field studies have been used to gather in-depth information from individuals experiencing poverty, social workers, policy-makers, and philosophers. This helps in understanding the experiences and subjective aspects of poverty. To provide a holistic view

of poverty, relevant concepts from disciplines such as sociology, economics, and political science are included. This interdisciplinary approach enriches philosophical analysis with empirical data and practical insights.

The research methodology for studying poverty as a philosophical problem includes a multifaceted approach that integrates literature analysis, philosophical and qualitative analysis, comparative and thematic analysis, and interdisciplinary concepts. This comprehensive methodology aims to contribute to a deeper understanding of the social, ethical, and political dimensions of poverty and to finding more effective solutions.

Literature Review

Although poverty was recognized as a global problem in the 20th century, its impact remains one of the main factors contributing to socio-economic and political instability. Experts acknowledge that the scale of the problem has expanded, leading to increasingly catastrophic consequences. Poverty is linked to primitive desires and limited spiritual needs, often stemming from a lack of familial educational potential, insufficient communication, underdeveloped social intelligence, and inadequate comprehensive education. This can result in an inability to adapt to the pace and dynamics of societal development.

The issue of poverty as a social phenomenon has been studied and researched by numerous thinkers and specialists. Notably, philosophers such as Karl Marx (Karl Marx, 1867), Aristotle (Aristotle 2001), Mahatma Gandhi (Mahatma Gandhi, 2020), and Amartya Sen (Amartya Sen, 1999) have expressed their views on the dangers of poverty to societal life.

Poverty is a multifaceted social phenomenon characterized by limited access to resources, social discontent, restricted personal and educational development, lack of initiative, resignation, and a tendency towards victimhood. Poverty is naturally defined as a state, either permanent or temporary, that is opposite to wealth. It has a dual basis: material (access to resources) and spiritual (moral, educational, and socio-psychological qualities).

Poverty is characterized by the restriction or absence of access to material, social,

and spiritual benefits, which are available in greater quantities to others in the same society. People living in poverty often experience dissatisfaction with their lives and lack social engagement, leading to feelings of social discomfort, injustice, and tension.

Individuals living in poverty often show a lack of social initiative and responsibility necessary for their development and self-awareness. Among them, there is a tendency to devalue their lives, lose the meaning of life, develop a dependent psychology, and exhibit a high degree of resignation (seeing themselves as victims of circumstances).

The topic of the “philosophy of poverty” is very broad and can be examined from various perspectives, including philosophical, sociological, economic, and even religious aspects. Some possible approaches to studying this topic include:

1. **Philosophical Concept of Poverty:** Analyzing and interpreting various philosophical views on the nature of poverty. This includes classical philosophy (e.g., Aristotle’s concept of justice), modern philosophy (e.g., social contract theory or critiques of capitalism), and ideas from various cultural and religious traditions.

2. **Sociological Analysis of Poverty:** Studying the social and structural aspects of poverty in society, such as racial, ethnic, gender, and other inequalities that may be fundamental to understanding the causes and consequences of poverty.

3. **Economic Analysis of the Philosophy of Poverty:** Examining economic theories and models related to poverty, such as theories of income distribution, human capital theory, and cyclical poverty, as well as their philosophical and social implications.

4. **Ethical and Spiritual Dimensions of Poverty:** Discussing ethical issues related to poverty, including justice, social responsibility, human rights, and society’s responsibility towards the poor.

5. **Historical Perspective:** Analyzing the historical conditions and evolution of the concept of poverty in different cultures and societies, as well as the history of efforts to eliminate poverty and develop social policies and programs.

6. **Religious and Cultural Aspects of Poverty:** Studying traditional and contemporary

religious and cultural views on poverty and the role of religion and culture in combating it.

Analysis and Results

Poverty, as a social phenomenon, represents a state of social existence that deprives individuals of the wholeness and completeness of human existence, standing in stark contrast to wealth. It manifests destructively across all spheres of society and personal life. Poverty at a higher social level quickly impacts interpersonal and individual levels. In turn, due to its interconnected nature, it influences the higher social levels, transitioning from one domain of human and societal life to another. This principle is clearly evident in the world of human life, encompassing both everyday reality and the institutional and normative systems.

Poverty, entrenched in daily consciousness as a prevailing idea, can be addressed not only through material solutions but also by improving social existence and developing individuals' moral and spiritual dimensions through theoretical reflection.

Despite its widespread impact, poverty remains an integral part of social life for both society and its individual members. Under conditions of private ownership of the main means of production, the disparity in the quality of life persists across all levels of sociality. While it may be impossible to completely eradicate relative poverty, society at every level must create conditions to mitigate its consequences.

Key Considerations for Alleviating Poverty.

Material Solutions: Meeting the material needs of individuals and communities by ensuring access to essential resources such as food, shelter, healthcare, and education.

Theoretical Considerations: Understanding and addressing the structural and systemic causes of poverty through critical thinking and reflection. This includes developing policies and foundations that ensure social justice and equality.

Moral and Spiritual Development: Supporting the moral and spiritual growth of individuals to foster compassion, solidarity, and a sense of community. This can be achieved through education, cultural programs, and initiatives that promote ethical values.

Interconnectedness of Social Levels: Recognizing the interconnectedness of individual and social levels of sociality and implementing strategies that address poverty holistically. This involves collaborative efforts among various sectors of society, including government, the private sector, and civil society.

Subsystem Interventions: Developing targeted measures for different subsystems of human interaction, such as environmental sustainability initiatives, social integration programs, and mental health support services.

By adopting a multifaceted approach that considers both the material and non-material aspects of poverty, society can work towards reducing the prevalence and impact of poverty, thereby striving for a more just and inclusive world. In a market economy, the influence of economic factors on human life, as well as the surrounding social and natural environments, is increasing. Generally, people are involved in economic activities that include the constant buying, consuming, producing, selling, and exchanging of production activities' products.

In a civilized society, economic relations are always formalized through legal documents. Among these, the natural rights that individuals receive at birth hold prominent positions. These include the right to life, the right to work and occupational freedom, the right to personal freedom, the right to marry, and the right to freedom of conscience. Additionally, individuals have the right to own property granted by society, the right to enter into contractual relationships, the right to economic freedom, the right to fair income distribution, and the right to the inviolability of housing.

A philosophical and economic analysis of citizens' rights shows that they are based on concepts common to both economics and social philosophy and sociology. These concepts include freedom and coercion, wealth and poverty, rationality and choice, labor and alienation, desire and need, economic ethics, economic culture, and socio-economic inequality.

The philosophical conception of poverty encompasses various aspects of understanding this phenomenon through the lens of philosophy. Some key elements of this conception include:

1. Freedom and Coercion: Examining how poverty can limit individual freedoms and the ways in which societal structures can coerce individuals into poverty.

2. Wealth and Poverty: Analyzing the dichotomy between wealth and poverty and their respective impacts on social structures.

3. Rationality and Choice: Understanding how rationality and decision-making processes are influenced by economic status.

4. Labor and Alienation: Investigating the relationship between labor conditions, alienation, and poverty.

5. Desire and Need: Differentiating between human desires and needs in the context of poverty.

6. Economic Ethics: Exploring the ethical considerations in economic behaviors and policies related to poverty.

7. Economic Culture: Studying the cultural aspects of economic activities and their role in perpetuating or alleviating poverty.

8. Socio-Economic Inequality: Addressing the broader issues of inequality and their connection to poverty.

Ethical Analysis of Poverty: Philosophers have engaged with the ethical issues related to poverty, discussing the fairness and unfairness of wealth distribution in society, as well as the responsibilities of society and individuals towards the poor. This raises the question of which ethical principles and values should guide society in addressing the problems of poverty.

Social Philosophy of Poverty: Philosophers analyze the social and structural aspects of poverty, such as inequality, discrimination, and social exclusion. They explore the factors and mechanisms that contribute to the creation and maintenance of poverty within society.

Political Philosophy of Poverty: Philosophers consider the role of the state and politics in relation to poverty. This includes discussing the government's responsibilities towards poor citizens, the effectiveness of social programs, and the ethical and political aspects of resource distribution and anti-poverty policies.

Cultural Philosophy of Poverty: Some philosophers study the cultural aspects of poverty, such as stereotypes and misconceptions about the poor, as well as the cultural

identities of poor individuals and their connection to social and economic conditions. Martha Nussbaum, a professor of philosophy at the University of Chicago, refers to anthropological research that highlights the tendency of human nature to build harmful hierarchies and discriminations.

Historical Perspective: Philosophers examine the historical contexts and evolution of the concepts of poverty in various cultures and societies. They analyze the dominant ideas and notions in different historical periods and how these have shaped contemporary understandings of poverty.

The philosophical conception of poverty helps us better understand the roots and causes of this phenomenon, as well as develop ethical and socially grounded approaches to address it.

Current Global Social Threat: Poverty is a significant global social threat. Unemployment, economic and social instability, unfulfilled hopes, and broken plans are driving the process of societal marginalization. Poverty hinders society's ability to realize its potential, linking it to regression in social development. Today, there is a significant disparity between the rich and the poor, leading to anger and discontent among the impoverished.

Joseph Stiglitz points out the increasing inequality and the growing segment of the poor population in the United States, urging the study of experiences from Scandinavian countries, Singapore, and Japan to learn how to ensure full employment and restore justice and harmony in society.

Other studies emphasize the role of "inclusive" institutions that serve the political and legal interests of all social layers in achieving sustainable economic prosperity.

The history of poverty can be traced back to the emergence of society itself. However, historical data on the recognition of poverty and the development of measures against it vary.

By addressing poverty through its material and non-material dimensions, society can strive to mitigate its spread and impact, ultimately working towards a more just and inclusive world. In market relations, the influence of economic factors on human life and the social and natural environment is intensifying. People are generally involved in economic activities, continually buying,

consuming, producing, selling, and exchanging products.

In a civilized society, economic relations are always formalized through legal documents, with natural rights received at birth holding a prominent place. These include the right to life, the right to work and occupational freedom, the right to personal freedom, the right to marry, and the right to freedom of conscience. Additionally, individuals have the right to own property granted by society, the right to enter into contractual relationships, the right to economic freedom, the right to fair income distribution, and the right to the inviolability of housing.

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Multifaceted Approaches to Addressing Poverty: Poverty results from a complex and interrelated set of causes, which scholars categorize into several groups:

- **Economic:** Unemployment, low wages, low labor productivity, and industrial competitiveness;
- **Social-medical:** Disabilities, old age, and high morbidity;
- **Demographic:** Single-parent families and high dependency ratios within households;
- **Socio-economic:** Low levels of social security and protection;
- **Educational:** Low levels of education and insufficient professional training.
- **Political:** Military conflicts and forced migration;
- **Regional-geographic:** Uneven development across different areas.

In its usual sense, poverty refers to the inability of a family to meet its basic needs for food, clothing, and shelter with their current income. This definition of poverty emerged in England at the end of the 19th century and dominated both theoretical and social policy perspectives throughout the first half of the 20th century. The evolution of ideas about poverty has led to various assessments of its scale.

One of the most significant reasons for different assessments of poverty levels is the differing approaches to defining the concept of poverty. There are numerous definitions of poverty, among which three main concepts can be distinguished: absolute, relative, and subjective poverty.

Absolute Poverty: This concept is based on comparing the minimum necessary needs with the resources required to meet these needs. People are considered poor if their income is below the cost of these minimum needs and if their basic needs are not adequately met.

When studying absolute poverty, two key issues must be addressed:

1. Developing an indicator that can be used as the poverty line.
2. Creating a system of indicators to compare with the poverty line.

Relative Poverty: This concept is linked to the level of material well-being in a particular country. Unlike absolute poverty, relative poverty levels rise with increases in overall income. This approach is more often used to compare socio-economic development across different periods within a country. Additionally, while absolute poverty may be overcome through appropriate government policies, the concept of relative poverty always assumes a certain portion of the population will be considered relatively poor.

Subjective Poverty: Developed by economists and statisticians at Leiden University in the Netherlands during the 1970s, this approach to defining poverty is based on the hypothesis that people participating in sociological surveys are fully qualified to judge what constitutes poverty. According to the Leiden method, based on a representative household survey, the income level perceived by the population as sufficient to meet their needs is determined.

Research indicates a correlation between people's subjective views and their objective living standards, such as income and needs. Conversely, some individuals with incomes below the poverty line may not consider themselves poor, while others may feel poor despite having incomes above the poverty line, depending on their living standards.

Understanding the Causes of Poverty: To combat and eliminate poverty, it is essential

to understand its causes. Repeated sociological surveys have shown that people attribute poverty to various factors, including government policies, corruption, laziness, national mentality, alcoholism, mafia influence, and monopolies.

The objective economic basis for the expansion of poverty and its transformation into a national issue exists in all countries with transitional economies. Therefore, prospects for reducing poverty are primarily linked to economic development. One significant cause of poverty is the lack of access to quality education. Official statistics show that the higher the educational level of the working-age population, the lower their risk of poverty. Resource allocation through assistance programs is implemented in three main areas.

Addressing poverty through both material and non-material dimensions allows society to strive to mitigate its spread and impact, ultimately working towards a more just and inclusive world. In market relations, the influence of economic factors on human life and the surrounding social and natural environment is intensifying. People are generally involved in economic activities, continuously buying, consuming, producing, selling, and exchanging products.

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First Direction:

A portion of income, as perceived by the population, is attributed to labor, but the vol-

ume of stipulated needs is also taken into account.

Second Direction:

The paid funds are not specifically related to the work of a particular individual, but the amount of these payments is considered to address the need for assistance. These payments encompass various groups such as many employed workers, single mothers, subsidies for specialized treatments for children, expenses for raising children, and government subsidies for maintaining children in boarding schools and hostels. The amount of these subsidies depends on the number of children and the financial status of parents.

The third direction involves directly providing benefits and services to the population in the form of tangible goods and services. This portion of allocated funds constitutes additional income. They do not exceed the state budget and are not subject to discretionary spending. Such income is distributed without considering individual labor contributions and is allocated based on perceived societal benefits and needs at a certain historical period. The recipients of state assistance are not all workers in general, but rather those at a particular level of need. For example, those who are frequently and severely ill and cannot afford medical services often seek free medical assistance, while children of school age, especially those from low-income families, often seek assistance from school institutions.

Analytical conclusions summarize that the following strategies are identified to combat corruption:

- Creating conditions to ensure the degree of prosperity for all families capable of working;
- Elaborating guarantees for the effective support of vulnerable groups in society without unnecessary financial constraints;
- Fostering cooperation between laborers, especially women, elderly parents of young children, single-parent families, and ensuring the role of the state in securing the rights of young workers by promoting collective agreements in the field of labor rights;
- Reducing corruption in the labor market by increasing the minimum wage

and reducing the number of workers vulnerable to unemployment;

- Increasing community cohesion;
- Improving the system of providing direct social assistance to vulnerable groups such as the elderly, disabled individuals, single parents, migrants, and others.

Finally, by analyzing the research and discussing the basic conclusions, the philosophical significance of combating corruption is emphasized, and some directions for further research in this area are proposed.

In addressing corruption, it is crucial to develop a comprehensive approach that takes into account both social and ethical aspects. This research delves into the philosophy of corruption, examining its societal, ethical, and political dimensions, thereby facilitating a better understanding of the nature of the problem and the formulation of effective strategies to address it.

Analyzing the causes of corruption demonstrates that these reasons can be attributed to several distinct categories, each with its own set of internal factors. These categories encompass external objective factors, internal individual factors, and societal factors, incorporating economic, legal, cultural, educational, healthcare, and administrative aspects.

Researchers identify the causes of corruption extensively, considering historical, civilizational, and socio-economic perspectives. These causes can be allocated to various groups based on their nature and impact. They arise from natural phenomena inherent to society and its environment, such as disasters, conflicts, and natural phenomena.

This research offers the possibility of devising effective strategies for combating corruption by understanding its root causes and addressing them comprehensively.

Factors such as chronic illnesses, mental and physical disabilities, can hinder a person's ability to escape poverty. Unemployment and the failure of social support systems exacerbate corruption.

Insufficient legal protection and lack of access to rights can exacerbate corruption, especially for those with weak legal protection.

In shaping cultural values, national customs, and ethical-economic environments,

play a significant role in influencing the level of corruption.

The level of education significantly influences the prevalence of corruption, with lower levels of education correlating with higher levels of corruption.

Inadequate healthcare services not only undermine people's health and productivity but also contribute to corruption. Corruption persists due to ineffective government systems described as corrupt administration and management, which fail to provide essential government services and assistance.

Conclusion

The causes of corruption are diverse and multifaceted, encompassing external, internal, and social factors. Fighting corruption requires a comprehensive approach that takes into account all these factors. Corruption is a complex social phenomenon influenced by both natural and social factors. While historical social conditions and consequences have been primarily considered in historical perspectives, natural factors have not received sufficient attention. This study aims to address this gap by analyzing the interdependence of both scales and suggesting strategies to mitigate corruption. Analyzing historical perspectives on corruption reveals that while social conditions (such as economic conditions, social structures, and policies) have been extensively studied, natural conditions (ecological factors, geographic conditions, and biological aspects) have not been adequately considered. In various historical periods, many researchers have emphasized the role of social factors in the emergence of corruption. They attribute this to economic disparities, social injustices, and inadequate healthcare systems. Economists and sociologists argue how these social conditions contribute to corruption and perpetuate it.

Research on the natural conditions of corruption reveals a significant gap in research. Environmental degradation, natural disasters, and geographical isolation are factors that can affect corruption, but aspects that have not been fully explored. The lack of attention to these natural factors hinders a comprehensive understanding of the full scope and complexity of corruption.

Analysis suggests that understanding corruption as a complex social phenomenon requires describing it as a complex social phenomenon based on the scarcity of material and spiritual resources necessary to meet human needs. It is based on social and natural conditions and continues through social and natural mechanisms, resulting in a range of social and natural consequences.

The research demonstrates that combating corruption requires a comprehensive approach based on natural and social factors. Obtaining and resolving mutual dependencies between these scales can lead to the development of more effective strategies to combat corruption.

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submitted 17.07.2024;

accepted for publication 30.05.2024;

published 13.06.2024

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