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AGRICULTURAL SCIENCES

THE EFFECTIVENESS OF THE USE OF NITROGEN FERTILIZER IN COMBINATION WITH PRE-SOWING WITH THE TREATMENT OF PEA SEEDS

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Abstract

The results of a field experiment to establish the separate and joint effect of nitrogen doses and pre-sowing treatment of seeds with the preparation rizotorphin on the seed productivity of sown peas are presented. The study was carried out in the conditions of sod-podzolic medium-loamy soil with a leafless variety of Corduroy forage purpose. The effectiveness of seed inoculation with the bacterial preparation rizotorphin was proved, the yield increase was +0.04...0.36 t/ha. When using nitrogen in doses of 30-60 kg/ha, there is a significant increase in the yield of pea grain by 0.06...0.32 t/ha. Due to the application of nitrogen fertilizer, the content of raw protein in the grain increased by 1.2-1.3 times, when treating seeds with the bacterial preparation rizotorphin – by 1.1%.

Keywords: nitrogen doses, rhizotorphin, seed peas, grain yield, crude protein content.

Introduction. The special value of leguminous crops lies in the high protein content in the seeds, leaves and stems of these plants [1]. Peas are considered one of the main leguminous forage crops in Russia. Its grain has high feed qualities, and therefore it is highly valued in feeding farm animals and poultry [2]. Pea protein contains a large amount of essential amino acids and is well absorbed by animals [3]. Pea grains contain natural sugars and saturated fatty acids, beta-carotene, vitamins A, E, H, PP, group B, micro- and macronutrients [4]. Pea grain shells contain insoluble dietary fibers, which consist of cellulose (83.78%), hemicellulose (7.34%) and lignin (8.85%) [5]. Pea grain is the main protein component of domestic compound feeds for the needs of animal husbandry. A kilogram of pea grain is equal to 1.15 k units and contains 195 g of digestible protein [6].

Material and research methods. The study was conducted in 2016 on the experimental field of the Perm State Agricultural Academy in the conditions of sod-podzolic medium loamy soil. The content of humus in the arable layer (according to Tyurin in the Nikitin modification) is 1.84%, pH_{KCl} is 5.6-5.8, the content of mobile phosphorus and potassium (according to Kirsanov) is 142 and 234 mg/kg, respectively.

The aim of the study was to study the effect of nitrogen doses and the drug rizotorphin on the productivity of Corduroy seed peas. To achieve it, a 2-factor field experiment was laid down according to the following scheme. Factor A – treatment of the seed material with the preparation rizotorphin: A_0 – without treatment; A_1 – with treatment. Factor B-nitrogen dose, kg/ha: B_0 –

N_0 , B_1 – N_{30} , B_2 – N_{45} , B_3 – N_{60} , B_4 – N_{75} , B_5 – N_{90} , B_6 – N_{105} , B_7 – N_{120} . In the presence of 4-fold repetition, the variants were presented on 64 plots located in 2 tiers. The total area of the plot was 150 m², the accounting area was 90 m². The object of research in the experiment was a leafless variety of forage Corduroy. Nitrogen was introduced in the form of N_{aa} (34.4% d.v.), for pre-sowing cultivation. The processing of the seed material with the microbiological preparation rizotorphin was carried out manually on the day of sowing according to the attached instructions. The cultivation of peas was carried out according to the technology of cultivation of grain crops for the conditions of the Non-Chernozem zone. Sowing was carried out in an ordinary way with a seeding rate of 1.2 million. germinating seeds per 1 ha in the second decade of May. Harvesting was carried out by direct combining, together with the direct method of crop accounting. The amount of crude protein was calculated by multiplying the total nitrogen content by a coefficient of 6.25, according to GOST 13496.4-93. The mathematical processing of the research results was carried out according to the algorithm of variance analysis.

Results and discussion. The introduction of nitrogen increases the productivity of pea plants. It is believed that the treatment of pea seeds rizotorphina, peas needs in the mineral nitrogen in the first stage of development until is formed a symbiotic apparatus, in subsequent periods of development peas goes on nutrition and symbiotic nitrogen fertilization inhibits the processes of nitrogen fixation and the activity of symbiotic bacteria (Table. 1).

Table 1.

The influence of the level of nitrogen nutrition and the treatment of seeds strain of microorganisms on yield of grain sowing peas, t/ha

Доза азота (фактор В)	Обработка ризоторфином (фактор А)		Среднее по В, НСР ₀₅ гл. эфф. = 0,13
	без обработки	с обработкой	
N ₀	1,31	1,41	1,36
N ₃₀	1,37	1,73	1,55
N ₄₅	1,46	1,56	1,51
N ₆₀	1,59	1,63	1,61
N ₇₅	1,34	1,43	1,39
N ₉₀	1,52	1,66	1,59
N ₁₀₅	1,50	1,43	1,47
N ₁₂₀	1,38	1,42	1,40
Среднее по А, НСР ₀₅ гл. эфф. = 0,04	1,43	1,53	-
НСР ₀₅ для частных различий для фактора	А		0,12
	В		0,19

The level of grain productivity of peas in the experiment ranged from 1.31 t/ha on the variant without treatment with a bacterial preparation and without nitrogen fertilizers to 1.73 t/ha on the variant with seed treatment with a bacterial preparation and nitrogen application at a dose of 30 kg per hectare. Based on the main effects of factor A, the effectiveness of seed inoculation with the bacterial preparation rizotorphin was proved (the increase in yield was 0.1 t/ha, with LSD₀₅ = 0.04). The indicated trend is due to the fact that the bacterial preparation contains a strain of microorganisms that is adaptive for sod-podzolic soils.

Based on the main effects of factor B, when using nitrogen at doses of 30, 45 and 60 kg per hectare, there is a significant increase in the yield of pea grain by 0.19, 0.15 and 0.25 t/ha, respectively. With an increase in the nitrogen dose to 75 kg/ha, there was a decrease in productivity to the level obtained without applying nitrogen fertilizers. This feature is associated with the

limited development of the root rhizobial apparatus and a decrease in the number of nodules on the roots of plants as a result of excessive nitrogen nutrition. In the variant with the introduction of nitrogen at a dose of 90 kg per hectare, there is an increase in grain yield by 0.20 t/ha with an LSD₀₅ equal to 0.13 t/ha, compared with the N₇₅ variant. This jump in yield is associated with the transition of pea plants to feed on nitrogen introduced with fertilizers. When applying N₁₀₅ and N₁₂₀, a decrease in grain yield was observed by 0.12 and 0.19 t/ha. In these variants, pea plants formed a high vegetative mass to the detriment of seed productivity.

The most important indicator for the qualitative characteristics of feed grain of peas is the content of raw protein. It reflects the sum of all nitrogenous compounds, which include protein and non-protein compounds (Table 2).

Table 2.

The effect of the level of nitrogen nutrition and seed treatment with a strain of microorganisms on the content of crude protein in the grain of seed peas, % on dry matter

Дозы азота (фактор В)	Обработка ризоторфином (фактор А)		Среднее по В, НСР ₀₁ гл. эфф. = 0,85
	без обработки	с обработкой	
N ₀	14,1	15,4	14,6
N ₃₀	18,8	17,5	18,1
N ₄₅	16,5	17,0	16,9
N ₆₀	21,1	18,0	19,5
N ₇₅	18,9	15,0	17,0
N ₉₀	21,6	16,8	19,4
N ₁₀₅	17,4	18,6	17,9
N ₁₂₀	15,0	17,1	16,1
Среднее по А, НСР ₀₁ гл. эфф. = 0,31	18,0	16,9	-
НСР ₀₁ для частных различий для фактора	А		0,88
	В		1,21

The content of crude protein in pea grain varied from 14.1% (in the variant without the treatment of seeds with the bacterial preparation rizotorphin and without the application of nitrogen fertilizers) to 21.6% (in the variant without the treatment of seeds with rizotorphin and with the introduction of nitrogen at a dose of 90 kg per hectare). Based on the main effects of factor A, it was proved that when seeds were treated with the bacterial preparation rizotorphin, the crude protein content was 1.1% higher. When nitrogen was added in all variants of the experiment, the crude protein content significantly increased, the greatest increase was characterized by the variant with the introduction of N at a dose of 60 kg/ha, the increase was 4.9%.

Conclusions. The maximum yield of pea grain in the experiment (1.73 t/ha) was obtained by combining pre-sowing seed treatment with rhizotorphin and applying nitrogen fertilizer at a dose of 30 kg/ha. Due to the inoculation of seeds with the bacterial preparation rizotorphin, the increase in the yield of pea grain was +0.04...0.36 t/ha. When using nitrogen in doses of 30-60 kg / ha, there is a significant increase in the yield of pea grain by 0.06...0.32 t/ha. Due to the introduction of nitrogen fertilizer, the content of raw protein in the grain increased by 1.2-1.3 times, when treating seeds with the bacterial preparation rizotorphin – by 1.1%.

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EARTH SCIENCES

DETERMINATION OF PRESSURE LOSS IN A SPATIALLY CURVED DEVIATED WELL

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ОПРЕДЕЛЕНИЕ ПОТЕРЬ ДАВЛЕНИЙ В ПРОСТРАНСТВЕННО ИСКРИВЛЕННОЙ НАКЛОННОЙ СКВАЖИНЫ

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Abstract

The article considers the issue related to the determination of hydrodynamic losses in the wellbore of deviated and horizontal wells, taking into account space curvature.

Based on the studies of hydrodynamic losses, a dependence was obtained in the borehole of deviated and horizontal wells, which allows one to determine the magnitude of pressure losses in bored wells.

The calculations showed that taking into account the spatial curvature of the well bore, when calculating the hydrodynamic pressures, leads to an increase of $5 \cdot 10^0$

Аннотация

В статье рассматривается вопрос, связанный с определением гидродинамических потерь в стволе наклонно-направленных и горизонтальных скважин с учетом кривизны пространства.

На основе исследований гидродинамических потерь получена зависимость в стволе наклонно-направленных и горизонтальных скважин, позволяющая определить величину потерь давления в пробуренных скважинах.

Расчеты показали, что учет пространственной кривизны ствола скважины при расчете гидродинамических давлений приводит к увеличению на $5 \cdot 10^0$

Keywords: pressure, profile, flushing, hydraulic resistance, spatial angle.

Ключевые слова: давление, профиль, промывка, гидравлическое сопротивление, пространственный угол.

В последние годы при бурении горизонтальных скважин с целью входа в пласт по горизонтали следует развернуть скважину по зенитному и азимутальному углу, как показано на рис.1,2.

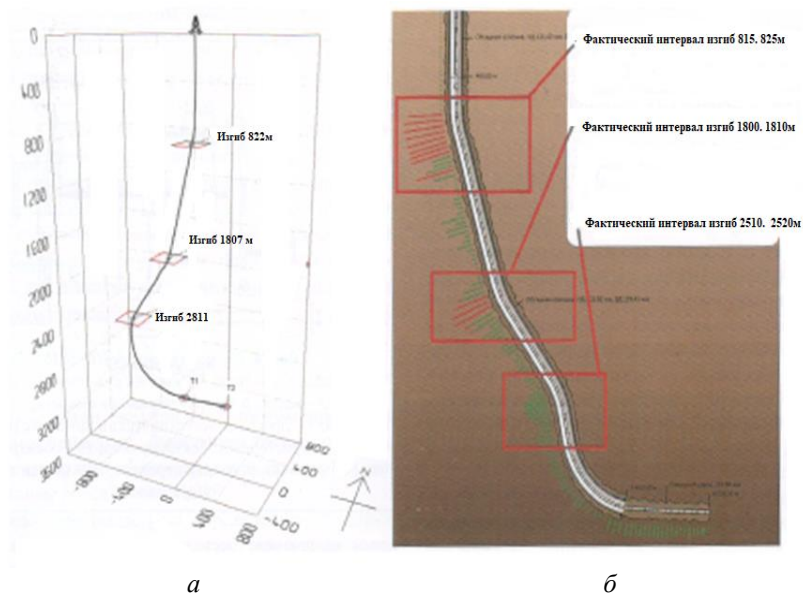


Рис.1. Интервалы изгиба буровых труб
а – профиль скважины; б – интервалы изгибов

Schlumberger

Smith Production Technology

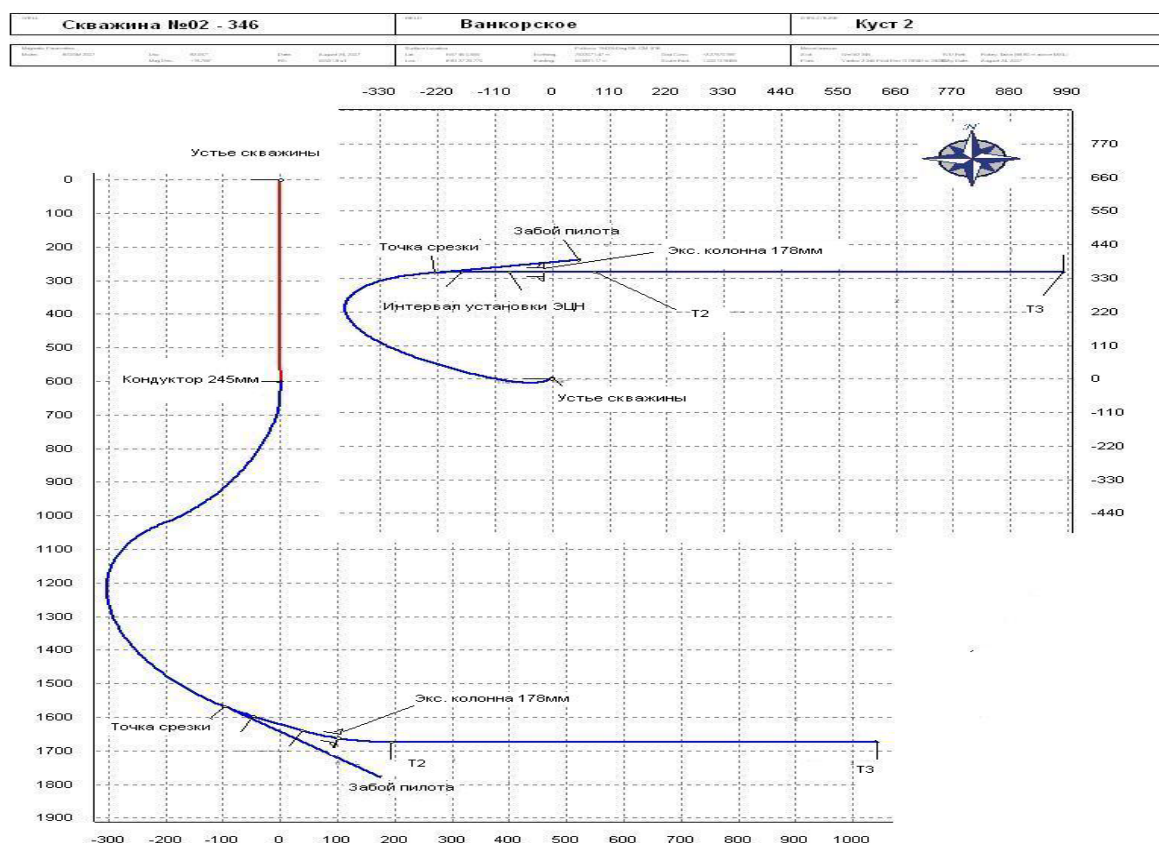


Рис.2. Наклонная и вертикальная проекция скважин

Это зависит от многих факторов; геологии, глубины скважин применяемого оборудования, конструкции и т.д.

При бурении таких скважин с целью выбора типа насоса и его цилиндров, необходимо определить все возможные потери в стволе бурящейся скважины. К этим потерям относятся: потери в манифольдной системе, в буровых трубах, в замках буровых труб, в утяжеленных трубах, в ведущих

трубах, в насадках долота, в турбобуре и в заколонном пространстве.

Некоторые из этих зависимостей по определению гидравлических потерь во многом зависят от длины и диаметра (такие как ведущая труба, буровая колонна, заколонное пространство) другая часть зависит от местных потерь в замках, долоте, турбобуре и т.д.

Величину потерь в циркуляционной системе определяются по известной формуле [1]

$$\Delta P_{\Sigma} = P_{от} + P_{кл} + P_{убт} + P_3 + P_д + P_{об} + P_{заб.дв} \quad (1)$$

где

$P_{от}$ – потери давлений в буровых трубах

$P_{кл}$ – потери давлений в кольцевом пространстве

$P_{убт}$ – потери давлений в утяжеленных буровых трубах

P_3 – потери давления в замках

$P_д$ – потери давлений в долоте

$P_{об}$ – потери в обвязке

$P_{заб.дв.}$ – потери давлений в забойном двигателе

Это выражение справедливо при бурении вертикальных скважин. Однако при бурении наклонных скважин, как известно, происходит искривление ствола скважины, как в азимутальном, так и в зенитном направлении, то есть происходит пространственное искривление. В этом случае происходит не только увеличение длины скважины, но и появляются потери в местах изгиба, которые не учтены при расчёте гидравлических потерь при бурении скважин.

Величину потерь в искривлённых частях скважин определяют по формуле [2].

$$\Delta P_{изг.} = \frac{\lambda}{90} \cdot \frac{v^2}{2g} \quad (2)$$

λ – коэффициент сопротивления.

φ – азимутальный угол.

V – скорость течения бурового раствора.

g – ускорение свободного падения.

В этой формуле величина φ есть угол поворота (азимут) скважины. Это справедливо только если течение происходит в плоскости изменения азимута.

Цель работы. В нашем случае изменение происходит как по азимуту, так и по зенитному углу. Поэтому в основу этой формулы есть необходимость, включить угол пространственного искривления ствола наклонной скважины, который зависит от изменения зенитных и азимутальных углов.

Угол пространственного искривления $\Delta\beta$ определяется по формуле [3].

$$\Delta\beta = \sqrt{\Delta\alpha^2 + \Delta\varphi \cdot \sin^2 d_{cp}} \quad (3)$$

где $\Delta\alpha$ – изменение зенитного угла

$\Delta\varphi$ – изменение азимутальных углов.

α_{cp} – среднее значение зенитных углов.

Таким образом заменив азимутальный угол изменения стволов наклонных скважин (φ) на пространственный угол ($\Delta\beta$) получим следующие выражение.

$$\Delta P_{изг.} = \lambda \frac{\Delta\beta}{90} \cdot \frac{v^2}{2g} \quad (4)$$

Полученное выражение включено в выше приведенную формулу, по определению гидравлических потерь в циркуляционной системе.

В результате чего было получено следующее выражение.

$$\Delta P_{\Sigma} = (P_{от} + P_{кл} + P_{убт} + P_3 + P_д + P_{об} + P_{заб.дв.}) + \sum_1^n P_{изг.}^n \quad (5)$$

где n – число изгибов в профиле скважины

$P_{изг.}$ – потери давлений в местах изгиба скважины.

Заключение. Сделанные расчёты по определению гидродинамических давлений в стволе наклонно-горизонтальных скважин по проектным данным (рис1а) и сравнения их с величинами давлений фактически пробуренными скважинами имеющие ряд изгибов (рис1б) показали, что в последнем случае величина давлений увеличилось на 5-10%

Эти изменения могут привести к неустойчивой работы насосов, а также к изменению общих гидродинамических давлений в стволе скважин, что может в конечном итоге привести к осложнениям в скважине, связанные с поглощением бурового раствора.

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ECONOMIC SCIENCES

FORMATION OF ENTREPRENEURIAL CAPACITY IN REGIONS AS A KEY FACTOR OF DEVELOPMENT OF BUSINESS ENVIRONMENT IN THE CONTEXT OF INNOVATIVE TRANSFORMATIONS

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ФОРМИРОВАНИЕ ПРЕДПРИНИМАТЕЛЬСКОГО ПОТЕНЦИАЛА В РЕГИОНАХ КАК КЛЮЧЕВОГО ФАКТОРА РАЗВИТИЯ БИЗНЕС-СРЕДЫ В КОНТЕКСТЕ ИННОВАЦИОННЫХ ПРЕОБРАЗОВАНИЙ

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Abstract

This article is devoted to the study of the main features and perspective directions of the formation of entrepreneurial potential of the population in the regions of the Russian Federation. The theoretical definitions of the concept of "entrepreneurial potential", its main features, structural components of the entrepreneurial potential, factors that have a significant impact on its formation and development are considered. The important role of entrepreneurial potential as a key factor in the formation and effective development of the business environment of the regions of the Russian Federation is substantiated. The special role of Russian small and medium-sized enterprises in the effective implementation and successful development of innovative transformations in the national economy of the Russian Federation, both at the regional and federal levels, is considered. It is shown that small and medium business in modern crisis conditions in relations with developed countries becomes the main reserve of innovative development of the national economy of Russia. The peculiarities of formation and development of entrepreneurial potential in both urban and rural areas of the Russian Federation are investigated, promising directions of development of small and medium business in Russian cities and villages are determined. The main directions of the state policy on assistance to strengthening and effective development of small and medium business in the regions of the Russian Federation as the most important structural component of the regional business environment are determined.

Аннотация

Настоящая статья посвящена исследованию основных особенностей и перспективных направлений формирования предпринимательского потенциала населения в регионах Российской Федерации. Рассмотрены теоретические определения понятия «предпринимательский потенциал», его основные особенности, структурные составляющие предпринимательского потенциала, факторы, оказывающие существенное влияние на его формирование и развитие. Обоснована важная роль предпринимательского потенциала как ключевого фактора в формировании и эффективном развитии бизнес-среды регионов Российской Федерации. Рассмотрена особая роль российского малого и среднего предпринимательства в эффективном осуществлении и успешном развитии инновационных преобразований в национальной экономике Российской Федерации, как на региональном, так и на федеральном уровнях. Показано, что малый и средний бизнес в современных условиях кризиса в отношениях с развитыми странами становится основным резервом инновационного развития национальной экономики России. Исследованы особенности формирования и развития предпринимательского потенциала как в городских, так и в сельских территориях Российской Федерации, определены перспективные направления развития малого и среднего бизнеса в российских городах и селах. Определены основные направления государственной политики по содействию укреплению и эффективному развитию малого и среднего бизнеса в регионах Российской Федерации, как важнейшей структурной составляющей региональной бизнес-среды

Keywords: entrepreneurial potential, business environment, regional development, innovative transformations, small and medium business, public policy.

Ключевые слова: предпринимательский потенциал, бизнес-среда, региональное развитие, инновационные преобразования, малый и средний бизнес, государственная политика.

Сегодня российская экономика находится в достаточно сложном состоянии. Для выхода из сложившейся ситуации экономике крайне необходим инновационный прорыв. Но в условиях осложнения международных отношений, затруднения доступа к новейшим технологиям развитых стран основной упор можно делать только на внутренние ресурсы, важнейшим из которых является предпринимательский потенциал регионов РФ.

Под предпринимательским потенциалом региона будем понимать совокупную способность к изменению ресурсных возможностей отдельных индивидов, организаций, отраслей, предпринимательской культуры, институциональной среды. Ресурсные возможности индивидов определяются совокупностью психофизиологических особенностей, профессионально-квалификационного уровня и креативности населения региона, способного к занятию предпринимательской деятельностью. Ресурсные возможности отраслей и организаций региона определяются совокупностью их финансовых, материально-технических, кадровых ресурсов, инфраструктуры. Способность к изменению институциональной среды связана с тенденциями совершенствования нормативно-правовой

базы, улучшения социально-экономической и политической среды в регионе [2].

Уровень развития предпринимательского потенциала существенно влияет на степень развития бизнес-среды региона. При этом вклад предпринимательства в устойчивое развитие экономики региона очень зависит от условий, созданных для его развития на региональном уровне [2]. Особенное значение для формирования благоприятной социально-экономической ситуации в регионе имеет малый и средний бизнес. Функционирование такого бизнеса напрямую связано с процессами, происходящими в экономике страны и регионов [1].

В табл. 1 показана динамика развития малого предпринимательства по России в целом за период 2014-2019 гг. Из табл. 1 видно, что численность малых предприятий за период 2014-2019 гг. выросла в 1,5 раза, численность персонала - на 4,4 %, оборот предприятий - в 2,14 раза, а инвестиции в основной капитал - в 2,3 раза. Такой существенный прирост показателей развития предпринимательства свидетельствует о возрастании значения предпринимательства в национальной экономике России.

Таблица 1

Показатели развития малого предпринимательства в РФ

Год	Количество предприятий, тыс. ед.	Численность персонала, млн. чел.	Оборот предприятий, трлн. руб.	Инвестиции в основной капитал, млрд. руб.
2014	1836,4	11,48	22,61	431,55
2015	2003,0	11,68	23,46	521,54
2016	2063,1	11,70	24,78	574,93
2017	2103,8	11,74	26,39	664,43
2018	2770,6	11,04	38,88	801,62
2019	2754,6	11,99	48,46	998,50

К числу проблем, препятствующих развитию предпринимательского потенциала региона, относятся внешние и внутренние. Внешние проблемы обусловлены преимущественно сложностью регистрации субъектов бизнеса и недостаточно развитой инфраструктурой предпринимательства. Решение таких проблем возможно только в процессе взаимодействия государства и субъектов предпринимательства. Внутренние же проблемы обусловлены преимущественно низким уровнем управленческой культуры в бизнес-среде, что требует обучения предпринимателей и менеджеров эффективной работе в условиях высокой рыночной конкуренции [5].

Важной проблемой развития предпринимательства до настоящего времени является его неравномерность по регионам России. В Центральном федеральном округе сосредоточено 35,4% малых предприятий, а в Северо-Западном - 13,8%. Таким образом, почти 50% всего российского малого бизнеса сосредоточено в этих двух наиболее экономически развитых регионах страны. Из них в городах Москва и Санкт-Петербург - около 30%. Такая неравномерность развития малого бизнеса

свидетельствует о существенном недоиспользовании предпринимательского потенциала остальных регионов РФ.

В структуре бизнес-среды России важнейшее значение сегодня приобретает инновационное предпринимательство, которое использует технико-экономические процессы для создания наилучших технологий и товарных свойств путем практического применения инноваций. Малый и средний инновационный бизнес является очень перспективной формой малого и среднего бизнеса, поскольку быстро реагирует на изменения конъюнктуры рынка, ускоряет процесс внедрения новейших достижений НТР, наилучшим образом использует научно-технический потенциал региона [3]. В то же время в отраслевой структуре малого бизнеса научную деятельность осуществляют всего 20 тыс. предприятий или 0,73% от общей численности малых предприятий РФ. В то же время деятельность в сфере торговли и ремонта автотранспорта осуществляют 36,16% предприятий, в строительной отрасли работают 12,47% предприятий, а в производственной сфере (обрабатывающие производства) - только 8,25%. Таким образом, имеет место

существенное неиспользование научно-технического и инновационного потенциала российского малого бизнеса, основная часть которого занята в сферах торговли, строительства, операциях с недвижимостью, транспортировке и хранению.

Предпринимательский потенциал и бизнес-среда региона тесно взаимосвязаны, поэтому необходимо изменение принципов взаимодействия в системе «общество - бизнес - власть», совершенствование средств и методов государственного регулирования, расширение практики наибольшего благоприятствования, формирования и развития новых компетенций власти и бизнес-среды [5].

Мировой опыт показывает, что лишь гибкое регулирование, внедрение «мягкого» управления дает возможность создания благоприятной почвы развития бизнес-среды, придать предпринимательству социальную эффективность. Повышение предпринимательского потенциала зависит от ориентиров, определяющих мотивы предпринимательской деятельности. Сегодня в России отношение общества к свободному предпринимательству неоднородно, необходим переход смыслов и ценностей на новый уровень, осознание роли и функций бизнеса в социально-экономическом развитии страны [4]. Высокая предпринимательская активность отмечается преимущественно в крупных городах, что обусловлено недостаточной эффективностью региональной политики развития предпринимательской инициативы, отсутствием стратегии социально-экономического развития регионов, неразвитостью региональной инфраструктуры [4].

В сельской местности РФ предпринимательский потенциал отличается особой спецификой. Там имеется потенциальная основа реализации и развития частной предпринимательской инициативы. В селах есть группы индивидов, состоящие из действующих сельских предпринимателей, которые объединяют также индивидов, показывающих перспективу начала предпринимательской деятельности [6]. Однако между потенциальной возможностью и жизненными планами имеется большой разрыв. В российских селах все еще сохраняется взвешенно-консервативный подход к выбору стратегий жизнеобеспечения, слабо проявляется социальный вектор самостоятельной самореализации. Поэтому реформирование села в РФ должно носить комплексный характер, включая государственный протекционизм для развития бизнеса и интегративную самоорганизацию сельского социального пространства с использованием механизма внутреннего формирования социальных ориентаций, нацеленных на предпринимательскую деятельность [3].

Основные принципы государственной политики развития малого и среднего бизнеса в России должны предусматривать соответствие мер поддержки развития бизнеса потребностям бизнес-среды и состоянию экономики региона; обеспечение равнодоступных условий получения государственной поддержки всем субъектам малого и среднего бизнеса; усиление муниципального аспекта поддержания малого и среднего бизнеса с постепенным переносом конкретной поддержки на реги-

ональный уровень; комплексный подход к поддержанию малого и среднего бизнеса, направленный на удовлетворение потребностей бизнес-среды на различных стадиях ее развития; приоритет относительно реализации региональных проектов развития бизнеса, направленных на получение максимального синергетического эффекта; партнерские отношения между исполнительными органами региона, местного самоуправления, общественными организациями, объединениями предпринимателей и организациями инфраструктуры по поддержке бизнеса.

В условиях экономического кризиса и осложнения международных отношений РФ с развитыми странами инновационное развитие экономики должно базироваться преимущественно на внутренних ресурсах, ключевым из которых является предпринимательский потенциал российских регионов. Государство должно существенно повысить эффективность политики формирования и регулирования бизнес-среды в регионах с учетом существенных различий в городской и сельской местности. Высокий предпринимательский потенциал населения регионов необходимо реализовать, органически сочетая усилия общества и органов государственного управления. При этом следует эффективно применять хорошо зарекомендовавшие себя инструменты государственно-частного партнерства, активно привлекать внешних и внутренних инвесторов к развитию региональной бизнес-среды и повышению предпринимательской активности населения.

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NATIONAL STRATEGIES FOR SOCIO-ECONOMIC DEVELOPMENT IN THE CONTEXT OF SCIENTIFIC AND TECHNOLOGICAL PROGRESS AND THE GLOBAL ECONOMY

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Abstract

The article is devoted to the analyses of basic national long-term strategies for socio-economic development through scientific and technological progress in the context of globalization, based on long term world experience.

Keywords: long-term socio-economic development, world economy, science and technology progress, technologies, innovations, public policy, globalization, protectionism, import substitution

Introduction

Over the past 100 years, scientists have developed various concepts for economic growth and economic development models. For centuries, economists have tried to create model "cures for success" based on the analyzing of vast amounts of statistical information and applying a wide range of mathematical methods.

However, the number of economic development trajectories is so large, and the exogenous and endogenous influences on the interrelations between the elements of the economic system are so strong, that the world economic system is more characterized by a state of chaos than a state based on the stable development of laws and a finite range factors influencing the system's change. The world economy is more similar to nature in its essence, in which certain laws are acting, but the final results in it are unpredictable in the long term and sometimes in the short term.

Scientists have not yet come to a consensus on which strategies, approaches and socio-economic development models are the most effective: development based on globalization principles and participation in global value chains or based on protectionism and regional value chains, development based on liberal economic policy without government intervention or based on a strong government role in the economy, development based on a high level of competition or through the creation of transnational corporations or oligopolies.

However, scientists argue that long-term economic development is connected with scientific and technological progress and it is based on the combination of human, technological capital development and fixed capital accumulation.

Economic history has demonstrated that there has never been a fully open market-based economy[5], perfect competition. The world economy in the 21st century is controlled by transnational corporations and oligopolies, and historically successful economic policy was based either on "managing the markets" or on setting the "wrong prices" [8]. Economists increasingly agree that the "invisible hand of the market" and the subordination of state economic policy to the principles of the "model of comparative competitive advantage" and "globalization" has destroyed many stable regional economic systems, turning them either into suppliers of resources or into markets for goods and services of "System-World" countries. Economists are increasingly saying that it is national governments that are the "invisible hand of the market" that either push national economies to the heights of prosperity or push them into a "poverty trap". World history also proves that there is no successful development model. Countries select their own developmental strategies, forming unique condition combinations, mechanisms, and resources.

The State and National Strategies

In general, national strategies are aimed at the following objectives:

- Sustainable long-term socio-economic state development and national wealth growth;
- Ensuring high rates of capital accumulation in the economy and continuous technological national industry modernization;
- Scientific and technological country development, technological capital accumulation and reproduction, striving for the upper layers of the "global technological corridor";
- Significant increase in the per capita income level and life quality of its citizens, continuous human capital development;

- Ensuring high scientific and technological progress rates in the priority sectors for development, which have significant scientific, technological and production potential, as well as total factor productivity growth in the national economy;

- Income and welfare growth for national companies and the creation of the most comfortable conditions for them to do business in the territory of the state and beyond its borders;

- State support provision for the development of "nascent" and priority economic sectors and related industries, corresponding to current and future technological waves [7];

- Attracting direct foreign investment into the economy, considering the independent technological

control level, as well as proceeding from the necessity to ensure national economic security and the possibility of convergence between national and foreign technologies and knowledge;

- International trade development with simultaneous control level of openness of the national economy;
- State's competitive improvement in the world economic and political spaces;
- Ensuring national security.

On the one hand, national development strategies are not limited only by territorial boundaries, but are supranational in nature, i.e. they provide state interests that go beyond national borders. On the other hand, each state has a different capability to implement its national development strategy, since each country has a different combination of its own military, financial, economic, and technological advantages, as well as the ability to attract external resources for its development. Effective state national development strategies are aimed at the conditions formation, either of allowing the country to take a leading position in a new systematic accumulation cycle, a new long economic cycle, or allowing the state to ensure a current leading position, keeping in mind the long-term future.

It is possible to distinguish five basic socio-economic development strategies on the basis of scientific and technological progress:

- Development strategy based on domestic core technologies and radical innovations (USA, Japan);
- A strategy based on imitation of technology and innovations (China, Taiwan, South Korea);
- An intelligence resource provider strategy (India);
- A production factory strategy (China, Taiwan, Vietnam).
- A combined strategy.

Countries combine strategies based on the reasonability and cost-effectiveness and the potential return on investment on a national scale, seeking in the long term to occupy key positions in global value chains, as well as to form a set of advantages and opportunities that would provide an unconditional competitive advantage in certain technological areas and industries in the global market and obtain a "monopolistic type rent" based on their own technology and innovation.

Each basic strategy is characterized by a set of advantages and disadvantages, i.e. risks that countries take in order to extract the potential benefits. At the same time, protectionism, import substitution, publicity and export support policies are inherent companions of combined strategies.

Effective national development strategies peculiarities

The author's research showed that the most effective national development strategies have a number of common characteristics.

First. National development strategies are long-term in nature, determine the strategic development guidelines for at least one long economic cycle, which roughly corresponds to a technological wave time period. At the same time, in the author's opinion, national

development strategies should cover the period corresponding to the systemic capital accumulation cycle.

Second. National development strategies are built on the basis of possible efficiency realization of unique existing comparative competitive national advantages in resources, people, technology, knowledge, and previously accumulated capital. Development strategies include the protection and strengthening of competitive advantages, as well as new advantage acquisition.

Third. National development strategies are built on scientific and technological country development priorities, both at the use of national knowledge and technology, and at the use of foreign technological and intellectual capital, human capital development along with the fixed capital accumulation as a production factor. Therefore, national development strategies form the conditions for external knowledge, technology and human resources absorption, as well as the creation of new knowledge and new technology.

Fourth. National development strategies are based on international economic formation, political and scientific and technological alliances, considering the balance of interests and based on the need to combine countries' resources to achieve strategic political, economic and scientific-technological goals.

Fifth. National development strategies are based on a balance between national economic openness and closedness, as well as a balance between national company protection and foreign company access to the national market.

Sixth. National development strategies provide for mutual market capital penetration as an export/import mechanism, economic and production ties strengthening between partner countries, international trade development, as well as a national capital accumulation mechanism.

Seventh. National development strategies are based on technological, market specialization principles and on regional specialization. National strategies take into consideration the phases of economic cycles and the long trajectory for innovative development.

Eighth. Based on limited resources and opportunities, national strategies are based on the supporting several "emerging" and priority economic sectors, especially high-tech industries, providing a comparative advantage to such industries, both in relation to other national industries, and in comparison, with similar industries in other countries.

Ninth. National development strategies provide for the creation of new or significant participation in global value chains, while ensuring that key elements of regional value chains function and remain in control at the national level.

Tenth. National development strategies include meeting international legal requirements while preserving the rights and opportunities to protect national political and economic interests. In addition, national strategies strive and participate in international legislation in order to strengthen their own competitive position.

Necessity for technological and market specialization in national development strategy is based on the

limited resources available according to state and economic agents. On the basis of certain technological and market specialization, a set of sectoral, technological and product state development priorities is formed, the target for state support and its parameters for the short-term, medium-term and long-term periods are determined.

Regional specialization proceeds from the fact that different territories within one state have different scientific and technological, personnel, production capacities and potential. At the same time, in limited resources conditions, the state cannot simultaneously develop the same set of technology and support creating

the same production opportunities in all territorial formations, creating in them the same scale of innovation systems.

The "knowledge supplier" and "production factory" strategies

The "knowledge supplier" and "production factory" strategies allow developing countries to gain access to technology and cash flow. However, if access to technology owned by other technologically advanced countries is restricted, if production is shifted to other countries, or if export orders are withdrawn, these strategies can lead to profound issues.

Table 1.

Advantages and disadvantages of the "knowledge supplier" and the "production factory" development strategies

Strategy	Advantages	Disadvantages
"Knowledge supplier"	<ul style="list-style-type: none"> • Access to technology and knowledge through foreign investments; • Employment growth. Workers' incomes in some industries are higher than the national average; • Significant revenues to the national economy, primarily due to foreign exchange earnings from the services exports. • Opportunity to support other economic sectors and scientific and technological development, as well as the development in related economic sectors; • Developing skills and competencies in the national workforce. "Experience effect"; • Working out export supply chains and channels. Possibility to build a global intellectual services hub. 	<ul style="list-style-type: none"> • The strategy mostly works for small countries or former colonies; • Value added and labor productivity is lower compared to countries that have their own technology and produce final goods, intellectual ready-made solutions, or control of the supply service channels to final consumers; • Critical dependence on intellectual services exports; • The risk of «brain drain» abroad, national human capital reduction risk; • New knowledge created generally does not lead to national technological capital development; • Often high export license payments to the country, which is the right technology holder; • Development of one's own products and solutions is mainly based on foreign technology; • Attraction of foreign investment to significant public expenditures; • The necessity of expenses connected with the requirement to provide constant increase in the number of qualified labor resources; • Income growth rate from intellectual services, including exports, is lower than the income growth rate for the employed population.
«Production factory»	<ul style="list-style-type: none"> • Access to technology and technological modernization in national industries through foreign direct investments; • Employment growth. Workers' incomes at productions created by foreign companies are higher than the average income in the country; • Capital accumulation, investment growth in the economy; • Competence development in the national workforce. «Experience effect»; • Increased national production of components, materials, intermediate goods in related economic sectors; • Working out export supply chains and channels (if there are agreements with foreign investors). • The opportunity to create a global export hub for certain goods; • Possibility of further transition to imitation goods strategy through national and foreign technological capital convergence. 	<ul style="list-style-type: none"> • Insignificant national value-added share in global value chains; • Labor productivity is not generating explosive growth; • Barriers to further transition to commodity imitation strategy through domestic and foreign technology convergence; • Barriers to export channel development (in the re-export agreements absence); • Production factor prices will increase over time, which reduces comparative national advantages; • The existence of sufficiently high public expenditures associated with foreign capital attraction; • In the situation when foreign investors transfer production from the country's territory, significant economic losses are possible; • Increasing technological dependence and opening up of various domestic markets, for which the country has a comparative competitive advantage, to foreign companies in exchange for technology and investment.

Source: compiled by author

It is important to understand that in the context of globalization, the localization of the production of goods with a high share for added value in the country's territory and foreign investment does not mean receiving large profits. The lion's share goes to companies with basic technology and intellectual property rights. For example, in 2009, China produced iPhones worth 1.9 billion USD, but only 73.5 million USD was value-added from Chinese production.

For intellectual service providers, it is possible to recall the Indian and Irish experience. In 2018, these countries jointly exported about USD 155 billion in IT services. Ireland and India account for about 28% of all global IT service exports, including software exports. However, these countries are characterized by a share of value added in ICT output that is below the global average.

Development strategy based on domestic core technologies and radical innovations

Development strategy based on domestic core technologies and radical innovations is characteristic for countries with considerable accumulated technolog-

ical capital, developed human capital, significant production capacities and financial investment resources, sufficient for structural changes in the national and global production and economic system.

The strategy is mainly characteristic of countries that form the "System-World" core in the corresponding systemic capital accumulation cycle or a long economic cycle. The countries possessing basic technologies and radical innovations form new international cooperation in order to combine technological, human, production and resource capabilities, and also own a «technology cluster» and a «basic product portfolio», which form the basis of the corresponding world technological wave.

Such countries, within the systemic capital accumulation cycle or a long economic cycle, based on their goals and priorities, form (or seriously change) the international relationship rules, including in international trade, intellectual property circulation, create new global chains for value-added good production and service provision, while determining their partner network from other countries, change global investment, trade and financial flows.

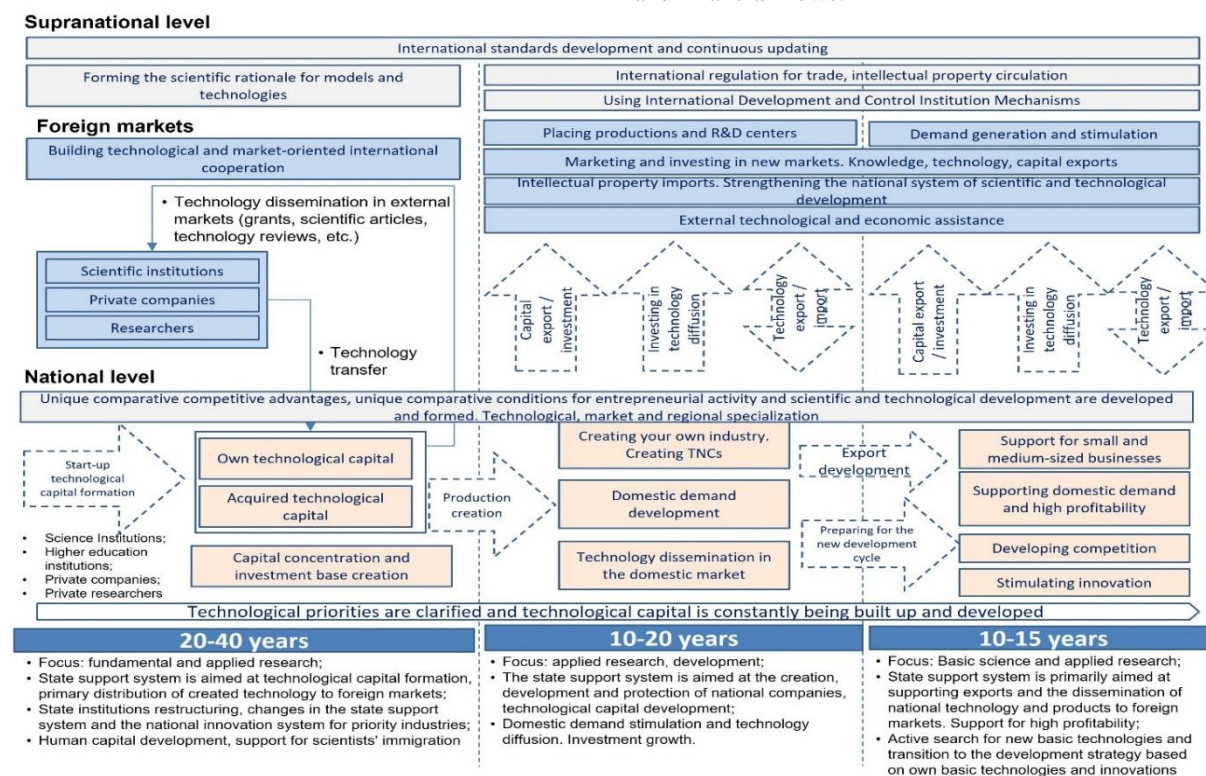


Figure 1. Development Model based on domestic core technologies and radical innovations

Source: compiled by author

The strategy provides for a fairly long implementation period - from 40 to 75 years, with each implementation stage corresponding to different tasks, approaches, and mechanisms used.

The first stage may last from 20 to 40 years, affecting the previous long economic cycle and technological wave. At this stage the basis for further structural changes in the national and global production and economic system is formed, resources are concentrated for a breakthrough, technological capital is accumulated, the focus is on fundamental and applied research, necessary human capital is formed, basic production

capabilities are developed based on a new combination of production factors, a comprehensive state support system is formed, and new conditions for business and industry are created.

The second strategy stage (up to 20 years) is mainly aimed at developing a set of products and services, to develop a «technological cluster», primarily by expanding R&D application, increasing investment in priority sectors in order to develop production capabilities, stimulating demand for new goods and services

and supporting national technology diffusion in domestic and foreign markets, including through the simultaneous technology and capital export.

At the third stage (up to 15 years) the strategy is aimed at maintaining high profitability in the economic sectors of highest priority, supporting domestic demand, aggressive policy in foreign markets, shortening

the life cycle of goods through improving innovation, and maximizing profit extraction. This stage is in preparation for a new development cycle. It seems important that for effective strategy implementation the technological priority clarification and technological capital accumulation should be carried out on an ongoing basis.

Table 2.

Advantages, opportunities, disadvantages and risks for development strategy based on domestic core technologies and radical innovations

Advantages	Disadvantages
<ul style="list-style-type: none"> • A country with basic technology and radical innovation can launch structural changes in the global economy; • «System-World» formation, in which the country is the leader. Leading positions in international technological and economic unions. Gaining strategic advantages in the global market; • Obtaining revenues on the basis of a «quasi-monopolistic type» in the long-term; • State and transnational companies created with its support actually control world markets; • The country forms new global value-added chains, while occupying positions that provide the highest income; • The country has a sufficiently long innovation lag, provided intellectual property protection and recognition by the established international rules of other countries in the intellectual property protection field; • Forming new international rules, including in an international trade. Creating new international development institutions, global technological standards; • Obtaining additional market and political power, gaining the ability to influence other countries. 	<ul style="list-style-type: none"> • Development solely on the basis of its own technology does not provide high economic growth rates in the long-term; • Emergence randomness in basic technologies and radical innovation, i.e. the need for huge investments with an ambiguous result; • The need to maintain a very high investment growth rate in R&D. Huge investments to adapt the national production and economic system to a new combination of production factors, as well as investment to support changes in the global market; • A long preparation period for the country's own human capital; • The emergence at the first stage of loss of labor productivity in traditional economic sectors; • Significant free resources required or free access to the resource base to build new industries on a national and global scale; • Huge investments necessary for new technology diffusion, both within the national and in foreign markets.
Features	Risks
<ul style="list-style-type: none"> • Basic technologies and radical innovation possession allows for the creation of fundamentally new economic sectors, fundamentally changing the quality of life and consumer mentality, providing the state with super profits in the long term; • Explosive productivity growth not only in the economic sectors that are basic to this technology and innovation, but also in related segments, which provides a significant increase in employee income and «accelerates» the economy; • Creates new jobs, both in new industries and in related industries. Changes the skill level and expands the national workforce's competencies; • Opportunities for additional development of sources through the windfall revenues. 	<ul style="list-style-type: none"> • Demand consumer lack for fundamentally new goods and services due to their inadequacy to meet consumers' needs. Mental unreadiness of the consumer market; • Lack the necessary sub-technologies set, restrictions by other countries on access to such sub-technologies; • Better technologies emerging in other countries that are more responsive to needs; • Countries with other similar technology (competing technology available) and significant resource capabilities may not allow to start a new technology cycle and new technology diffusion globally, protecting earlier investments in prior generation technology; • Lack of resources may leave developments based on new technologies at the prototype level; • Rapid technology and product imitation by other countries; • State development institutions and the national innovation system do not support the economic sectors development based on the new technology and radical innovation; • The state cannot provide new industries with a comparative advantage over other countries and other national industries.

Source: compiled by author

Talking about risks, it is possible to quote A. Grove, who said [4] that «American companies, realizing that production and engineering are cheaper in Asia than in America, began to move their engineering and production centers to Asian countries. American companies certainly benefited in profits, but the «job-creation machine» stalled because «Americans had too much faith in technology startups' ability to create new jobs».

According to the author, it is important to implement a number of conditions for the successful development strategy based on domestic core technologies and radical innovations.

First, basic technological capital and technological knowledge, which are essential to the formation of new national production and economic system should be hard to copy, which will increase the imitation lag and, therefore, increase the windfall revenues period. Technological knowledge should be protected by patents or through the introduction of different instruments to ensure that there are barriers to its imitation by other countries.

Secondly, public policy should aim, on the one hand, at lengthening the learning period in other countries in order to lengthen the imitation lag, and, on the other hand, at shortening the learning period in order to penetrate knowledge as quickly as possible for growth in consumption. That is, the policy should aim to ensure the rapid knowledge penetration in other countries, sufficient enough to understand the values of the new technological knowledge and new products and services, and consequently sufficient for the rapid penetration in foreign markets for these products and services, but not sufficient enough for the rapid technology, products or services to be imitated by other countries.

Thirdly, there should be constant reproduction for new technological knowledge through constant investment growth in R&D with simultaneous national production capacity development. At the same time, government policy should be targeted at supporting and developing the national demand for goods and services in order to lengthen the foreign reactionary lag, as well as to manage the propensity to import in the national market.

Fourth, the national production and technological system should permanently ensure the diversification of the national portfolio of goods and services, including expanding and improving and the number of pseudo-innovations.

Fifth, the state must provide manageable protection against the penetration of foreign technological knowledge into the country;

Sixth, the set of actions and mechanisms applied should be aimed at creating such conditions in which the imitation period and the cumulative costs of other countries' imitation reduce the potential imitation effect to the point where this effect for the imitator becomes insignificant and unprofitable;

Seventh, on the one hand, the state should create conditions and stimulate the flow of foreign technological knowledge into the country for its further processing or imitation and implement measures aimed at reducing the imitation lag for national companies. On

the other hand, it is necessary to stimulate and ensure national technological knowledge penetration into other countries in order to develop consumer demand in these countries for national goods and services created and provided on the national technological capital basis;

Eighth, an important condition for the successful strategy implementation is to develop and support the worldwide dissemination of new scientific economic theories and models, which are based on the new knowledge that the country possesses.

Development strategy based on imitation of technology and innovations

The development strategy based on imitation has become the primary one for the successful growth of a number of developing economies in the world, ensuring the convergence of countries on the technological and socio-economic development levels over the past 50 years at least. All of the countries around the world, including technological leaders, are engaged in imitation along with the development on their own technology. At the same time, the world is experiencing an increase in the volume of simulation with simultaneous simulation processes acceleration. As a result, there is a situation in which R&D costs for obtaining new technology and developing new innovative products is constantly growing, and the time lag for the innovator to make a super profit is constantly decreasing.

An imitation strategy is a consistent set of actions implemented jointly by entrepreneurs, national governments and system actors in scientific and technological development, which are aimed at the conscious choosing of a set of priorities related to simulated technologies considering national technological and production potential, providing access to these technologies, studying borrowed technologies and their convergence with national knowledge and technologies, their rapid copying and implementation in production, ensure penetration of imitated product at first in national market and in global market at subsequent stages.

A country which possesses basic technology and radical innovation provides the country which has chosen a development strategy on the imitation basis with technology, experience, knowledge, investment capital, extracting a certain set of benefits. Among such benefits, access to domestic and geographically related foreign markets, gaining access to specialized resources, technologies, knowledge, human capital available in the follower country, obtaining income from the intellectual property use, obtaining various tax and other benefits provided by the follower country, supplying equipment, intermediate goods, components and materials can be noted. The leading countries tend to transfer to other countries technologies from previous generations, reserving for themselves the possibility of further the windfall revenues through monopolistic type and preserving strategic competitive positions.

At the same time the follower countries strive to imitate commercially successful technologies and products, to have access to more modern technologies and intellectual property objects, which can be further processed using national technologies and knowledge.

States periodically increase foreign technology borrowing to develop their technological capital and increase potential combinations of knowledge, technology, and innovation, and some countries have been «global technology vacuums» for the past decades. For example, over 42% of Japanese goods and technologies owe their origin to foreign technologies that were imported into the country [3].

The countries which have chosen the imitation strategy pose a threat to the countries which are innovators, because they, even in the international legislation conditions on protection the intellectual property, cannot realize in full their opportunities on receiving the «monopolistic rent». In this case researchers note that innovator countries reduce these risks by improving policies and technology commercialization methods through using unique combinations of production factors, intellectual property protection and rapid expansion of technology diffusion in the global market, implementing «disposable products» or «planned obsolescence» technologies and goods concepts.

It is possible to note strategy features number of development strategy based on imitation.

At the first stage (about 20 years) the attracting foreign direct investments and large transnational corporations to the country in priority branches considering technological, market and regional specialization, which provides the basic technological capital, knowledge, fixed capital accumulation and national investment and production opportunities development, becomes of key importance.

Each country, using foreign direct investments mechanisms, determines what is acceptable for its country dependence on foreign investments and technologies. Proceeding from the given policy, the state, certainly, creating favorable conditions, for inflow to the country foreign direct investments as the technological and economic development factor, establishes access restrictions for foreign corporations on domestic markets and defines conditions for their activity in the country, including proceeding from national manufacturers protection necessity.

The policy choice depends on many factors and is related to the country's size and potential domestic market, the presence or potential development of own technological capital, the production potential level, investment opportunities, etc. International experience shows that countries that choose the significant dependence on foreign direct investment strategy form their local competencies and institutions by developing specialized infrastructure. Countries that have chosen a more independent policy are more focused on the technological

and human capital development, the borrowing and imitation policy of foreign technologies and products, their further processing and development on the convergent national production capabilities.

The key focus in R&D is development while conducting applied research. For example, in China for a long time there has been the following domestic spending distribution on research and development: 5% basic research, about 12.5% applied research and about 82.5% spent on development (82.7%).

In turn, the state support system is aimed at technology transfer and supporting their imitation and attracting foreign direct investments. At the same time the human capital development and the scientific-technological and innovation system modernization are carried out to support the national technological and product development trajectory. These processes are supported by a significant increase in national R&D expenditures, significant investments in high-tech economic sectors, domestic demand development for high-tech goods and services, as well as export development mechanisms.

The follower countries at the first stage ensure forming a critical entrepreneur's mass in the priority sectors, building up the research base, supporting small and medium entrepreneurship concentrated around large companies. Necessity to support the development of small and medium innovative business is that small innovative companies create 2.5 times more inventions than large companies, about 50% of all major technological innovations, while consuming a small part of national spending on R&D [2]. However solvent demand for these innovations is concentrated in large companies.

At the first stage special attention by the state is given to identify development restrictions and realize mechanisms on their elimination, including by providing national companies with access to technology and cheap investment credit resources. At the state level various strategic sectoral plans and scientific and technological development plans are formed, a system of restrictions and barriers designed to protect national companies in the domestic market is formed.

The follower countries, attracting foreign investment, in exchange for access to the domestic market and using their unique comparative competitive advantages, gradually provide through the state policy implementation an increase in the materials percentage, intermediate domestic goods in the production cost goods structure produced at the enterprises, created at foreign capital expense.

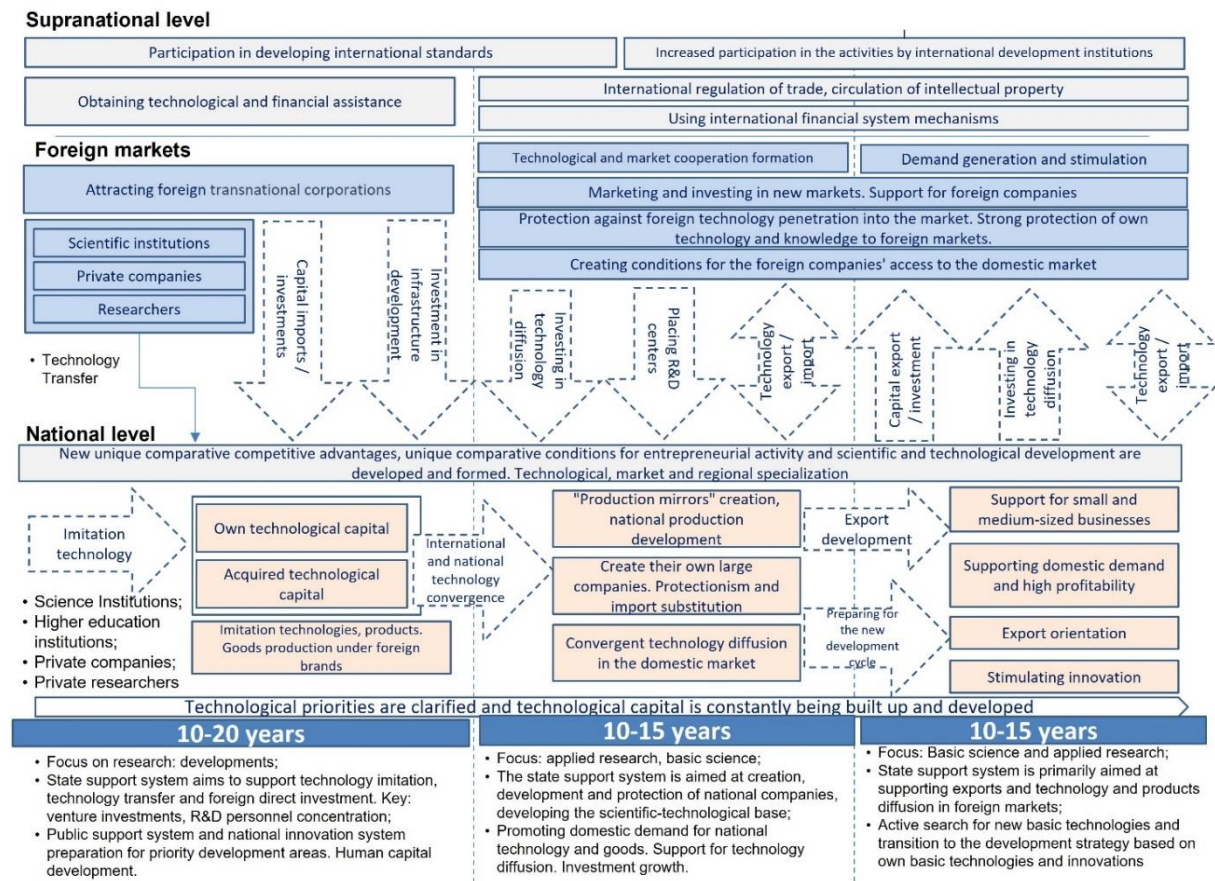


Figure 2.

Development model based on imitation of technology and innovations

Source: compiled by author

At the subsequent stages in the country strategy implementation gradually begin to pass to the development strategy on their own or convergent technology, actively involving national resources in the accumulation and development of their own technological capital, national production capabilities development. The state policy is mostly aimed at supporting national companies, forming national transnational corporations, supporting the domestic demand for goods produced on the basis of their own technological base, while pursuing an active policy on foreign markets. At this stage, follower countries begin to form their own technological and economic alliances and cooperation, competing with innovator countries in global markets. The focus

in R&D is shifting from development to fundamental and applied research.

Countries are increasingly limiting, through direct or indirect regulatory mechanisms, foreign access to the domestic market, as well as the weakening of opportunities for foreign companies in the national market, including those who used to invest in the national economy development. Gradually, the national technology contribution to the scientific and technological progress and to the economic growth rate begins to exceed the foreign technology contribution.

A national development strategy based on imitation is characterized by a number of advantages, opportunities, disadvantages and risks.

Table 3.

Advantages, opportunities, disadvantages and risks for development strategy based on imitation of technology and innovations

Advantages	Disadvantages
<ul style="list-style-type: none"> • Lower total cost for basic technological capital formation and the cost to organize the goods production. For innovative products, the cost to copy, on average, is 65% of the innovation cost, and the borrowing time cost is about 70% less compared to the time it takes to create a new product [6]. The borrowing cost will be less the higher the human capital quality [6], and the cost to copy technology will be less the greater the trade volume between the leading country and the follower country [6]; • The lack of the «primary randomness factor» due to the imitation of commercially successful goods and services, for which there is already a demand; • The predictable assessment of technology and innovation diffusion rate; • More efficient available resource use; • Approaching the «global technological corridor» upper boundaries through foreign capital and foreign technology; • Modern high-tech production formation in the country's territory. Lower adaptation costs of the national economy to new combination of production factors; • Appearance of new «points of economic growth», national economy structure diversification; • National exports development through goods re-export produced by industrial enterprises set up with the foreign capital participation. Working out export supply chains and channels. 	<ul style="list-style-type: none"> • A lack of the windfall revenues based on monopolistic rents from basic technology and radical innovation. Lower total imitation costs are associated with lower potential returns, but as long as the share of national innovations and technology in products is negligible; • Lower labor productivity and lower return on technology compared to countries with basic technology and radical innovations; • Output per worker in the follower country does not reach the output level in the leader country. The level of per capita consumption in the follower country in most cases is also less than the consumption level in the leader country [6]. However, it's possible in the follower country with very strong state regulation and a significant domestic consumption market; • The model works for a limited, though significant, time period, until the countries possessing the basic technology don't feel threatened by the country imitating technologies. Then the innovator countries limit access to their technologies and innovations; • Significant exports of goods and services are carried out over a long time period not by national, but by foreign companies that have placed their production facilities in the follower country; • Dependence on foreign investment, foreign technology, key imported materials, components and equipment.
Features	Risks
<ul style="list-style-type: none"> • Opportunity to access advanced technologies, knowledge and experience through foreign direct investments; • National capital accumulation opportunity at the external sources with the simultaneous possibility of investing into the national scientific and technological support system, educational system, national companies support at the internal financial resources; • The possibility to modify foreign technologies, their convergence with national technologies, to create alternative productions («production mirror») with a significant share using national technologies, materials, intermediate goods; • Higher economic growth rates due to the simultaneous foreign and national technologies applications. 	<ul style="list-style-type: none"> • Lack risks to access to advanced basic technologies and innovations, as well as restrictions on access to sub-technologies set, which will not allow successful imitation and competitive quality products production; • Lack risks of experience and national human capital required to build industries based on imitated technologies; • International rules violations on the intellectual property use can lead to serious economic and political consequences; • Restrictions risks by innovator countries on follower countries' access to foreign markets; • Lack risks of demand for simulated technologies and products; • Risks associated with system unreadiness of scientific and technological development and the national innovation system to support the development processes and national technological capital commercialization and convergence processes between national and foreign technologies; • Insufficient internal resources for development; • Readiness lack of the national economic agents to develop national production capabilities and invest into R&D; • Decrease lack in the propensity to invent, a decrease in the activity of researchers [6].

Source: compiled by author

«Opportunity windows» and a national strategy for development based on imitation

World history suggests that there are several «opportunity windows» for implementing the imitation strategy as public policy for national industrial development and economic growth.

First, the «opportunity window» opens at the depression stage, the forming of new «technological clusters», at the initial trajectory stages of product development and low technology diffusion. The reasons the presence of the combination of factors characteristic of several countries or economic agent groups, including the alternative technology availability, basic technologies rapid licensing, appropriate production availability, investment opportunities and human capital. First «opportunity window» can be defined as a «rapid second».

The second «opportunity window» for the follower countries, on the one hand, is associated with a

set of factors and the availability of comparative competitive advantages, primarily related to factor prices, a significant domestic market or the availability of raw materials, new materials, etc., and on the other hand - associated with the signs of decreasing capital returns, decreasing productivity rates and decreasing income growth rates in certain industries in innovative countries (or if innovator countries, for example, have the strategy to relocate production to low-wage economies). In this «opportunity window», there is an increase in foreign direct investments, which allows some countries to access to capital, technology, and knowledge and launch imitation strategy. However, this opportunity is open if the country has unique comparative advantages, political and economic factors, as well as the national government's will presence expressed in real practical actions both to form more favorable in comparison with other countries conditions for doing business in certain economic spheres and to carry out structural reforms.

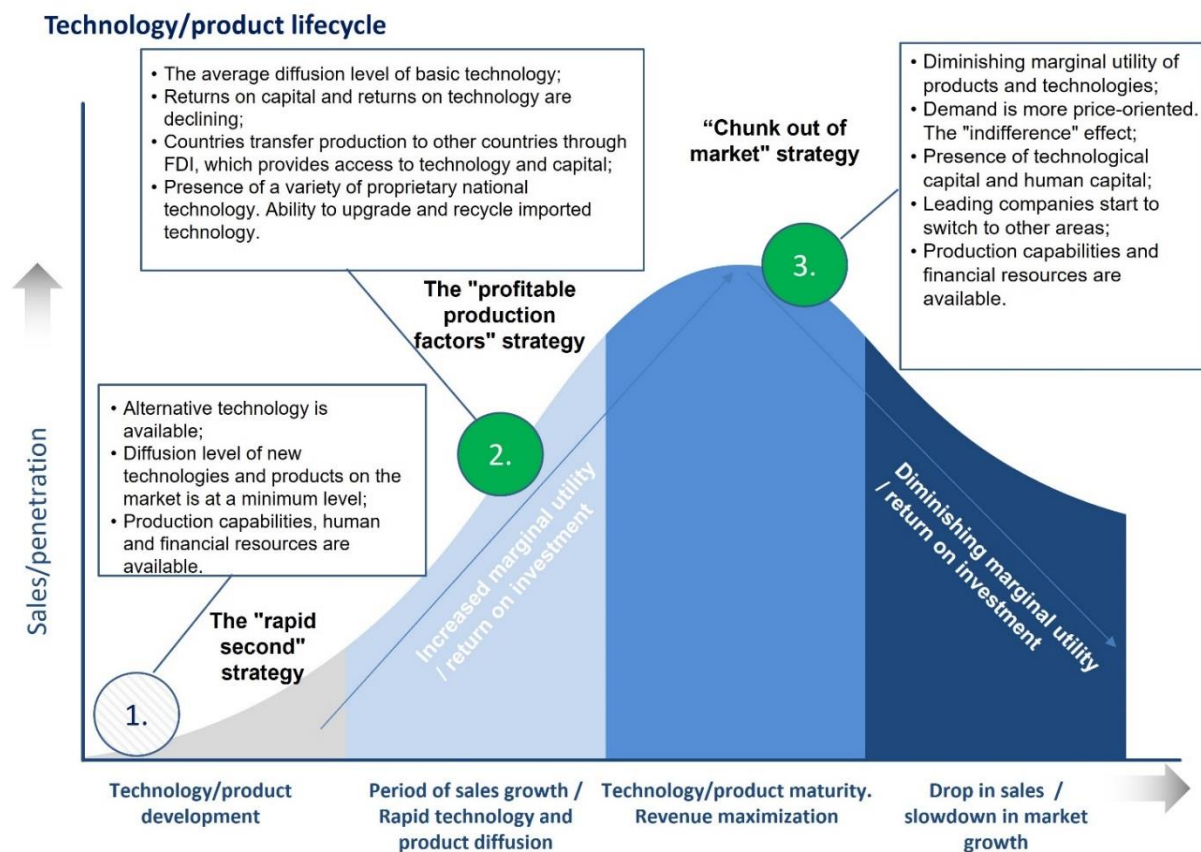


Figure 3. "Opportunity windows" for implementing the imitation strategy

Source: compiled by author

The third «opportunity window», which can be characterized as «chunk out of market». This «opportunity window» arises at the diminishing returns on capital and investment stage, a decrease in the labor productivity growth rate due to the emergence of diminishing returns on the technologies used, a decrease in the technology diffusion rate and the diminishing marginal utility of goods and services produced (provided) on the obsolete technologies basis. At the same time the penetration level for a set of technologies in the market is already high enough, but the market still

has opportunities for growth. Consumers have an «indifference effect», and price becomes one of the dominant factors.

At this time, the leading countries or technological leaders begin to switch to other technological and market areas. At the same time, other countries, which occupy some share in the technological market segment, have accumulated sufficiently significant national technological capital, human resources, have production and financial capabilities.

In the third «opportunity window» there may be realized a situation of real needs and values mismatch

to the opportunities offered in the goods and services by technologies combination with simultaneous limits approach of technological development for one technology group and marginal utility reduction for another technology group. In this period, countries can implement imitation strategy in a particular technological field or set of technological areas, using their comparative competitive advantages, while increasing their market share and displacing the leaders. As an example, we can take Chinese mobile device manufacturing company Huawei, which in just 8 years (2010-2018), according to statista.com, increased its global market share almost 9-fold from 1.5% to 13%, using the second and third «opportunity windows» under the Chinese government's public policy.

Conclusion

On the one hand, global economic development history has shown that there is no typical national development model with typical conditions, approaches, resources, and state support tool combinations. This is due to the fact that countries differ in size, technology ownership level, size of accumulated technological capital and production capabilities, qualification level of human capital, and investment opportunities. Therefore, countries independently design national development strategies, forming unique conditions, approaches, resources and mechanism combinations. However, the study showed that the number of basic development strategies in the scientific and technological progress context are limited. And the choice of each basic development strategy as a priority is characterized by different benefits, drawbacks, opportunities and risks set.

Completely «open» or completely «closed» economies have failed or collapsed. Countries that have succeeded have been those that have been able to combine growth models that provide, on the one hand, protection of national producers and, on the other, a manageable level of country openness. A country benefits from globalization only by having strong national production, a set of unique competitive advantages and accumulated comparative advantages in certain world economic sectors. Some countries, effectively using the «imitation strategy» and «development strategy based on domestic core technologies and radical innovations» combination, were able to profitably realize their comparative competitive advantages, create their own large high-tech industrial enterprises and ICT-companies, capable of producing competitive products and providing competitive services in domestic and foreign markets.

Countries that built their strategy solely on borrowing technology failed to make an economic breakthrough. However, the convergence of their own and foreign technology generates a synergistic effect, which allows for about 20-30 years to make a qualitative leap forward and ensure sufficiently high growth rates. Researches show that only relying on one's own technology, it is possible to provide economic growth rates at a level of no more than 2-3% a year, while borrowing simultaneously from effective foreign technology (technology transfer with imitation and processing possibility) it is possible to reach economic growth rates of 6-8% a year [1].

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IMPLEMENTATION OF DIGITAL TECHNOLOGIES IN INFORMATION SYSTEMS FOR SUPPLY CHAIN MANAGEMENT**Sizov P.***Postgraduate student,**Ural State University of Economics,**620144, Russia, Yekaterinburg, 8 Marta str./Narodnaya Volya, 62/45,*DOI: [10.24412/2701-8369-2021-18-25-26](https://doi.org/10.24412/2701-8369-2021-18-25-26)**Abstract**

The article discusses the current problems of supply chain management in modern conditions. A review of the literature on the use of digital technologies in supply chain management. The relevance of the use of automated systems in supply chain management.

Keywords: Logistics systems; digital technologies; digital logistic; blockchain;

Introduction

Supply chain management as the main end-to-end material business process is becoming a key competence of economic entities. In recent years, the number of “transactions” associated with the transportation of goods and other logistics operations has significantly increased, which in turn affects the formation of the final cost of goods for the consumer, and is in one way or another related to supply chain management.

Companies increase the responsiveness to the needs of customers, fulfill their requirements for the delivery of the right product to the right place at the right time, build a model of the logistics network and create a system for its information support, into which, in turn, the economic and mathematical apparatus is integrated, and digital technologies such as blockchain, installation of sensors for recording events and transmitting information online, web technologies, cloud technologies, distributed data exchange, storage and processing of big data, artificial intelligence concept, etc. can be applied.

Digital Technologies in Logistics

In order to effectively manage supply chains, you need to track and process vast quantities of information. Naturally, the greater the quantities of information, the more critical the issue of the need to use effective tools for analyzing and processing data becomes. These tools include various information systems that automate the processes of accounting, planning, control, and optimal decision-making.

The paper “Conceptual Framework for Supply Chain Management in E-Commerce” points out the relevance and need for the development of information systems in supply chain management, because it is a resource for reducing logistics costs of the goods distribution process, which e-commerce provides without the involvement of commercial intermediaries and personnel in their traditional form. The implementation of information technologies brings control in supply chains to a new level, generates relevant data for making operational decisions, it becomes possible to optimize production based on demand information monitoring [1].

World market needs for the implementation of modern information systems that allow purchasing at enterprises. The standardization and centralization of

procurements at the enterprise opens up new opportunities for management in logistics and supply chains, but at the same time there is a large quantity of information that needs to be processed quickly, which is impossible without the use of information systems [2].

As for the buyer, as the end user of the product, the trend of introducing the Internet into logistics makes it possible to show the transparency of the transportation process. Firstly, he will be able to trace the point of origin of the product – whether the product is counterfeit or fake. Secondly, when the logistics company installs temperature change sensors, the recipient can check whether the conditions of transportation of the product have not been violated. For example, when considering the transportation of iron ore concentrate, which freezes during winter transportation and leaves an impressive part of the cargo on the sides of a railway carriage, information about the temperature and method of delivery can become essential in deciding on the choice of a logistics company. [3]

Shipping and delivery multinational companies including DHL, TNT, UPS, Federal Express, SeaLand, and others open their systems with programmable APIs, allowing customers to access, track and share logistics information in a variety of innovative ways. Webcasting and publishing techniques allow anyone interested to be aware of situations requiring attention. And these systems continue to develop, elements of artificial intelligence are introduced into them – algorithms that themselves will make optimal decisions in difficult situations without the involvement of specialists.

Blockchain digital technology provides the formation and maintenance of a digital register of transactions with any assets in several places at the same time. Most often, blockchain is referred to as money transactions, but this technology can be extended to any interconnected information blocks. Recently, blockchain has begun to be actively used in transport logistics to ensure transparency of cargo operations along the entire supply chain, integration of market, commercial and production information to reduce risks and switch to intelligent and paperless technologies for the relationship of all participants in the economic turnover. At the moment, digital technologies are being implemented especially actively in maritime transport. This is due to the fact that many segments of the shipping

industry have limited margins, and digitalization can increase the competitive advantage. For example, CMA CGM, one of the world's largest shipping companies in terms of maritime traffic, is migrating its services to the Freightos digital platform, which will allow customers to access information on prices, routes, and availability of carrying capacity. In the future, the service of freight transportation on key trade lines will operate in the mode of passenger lines, when customers can book any service online almost instantly.

Among the priority areas of blockchain application for transport logistics is the digitalization of transactions, which are currently recorded on paper. For example, in maritime transport, paper bills of lading are usually used. According to experts, the costs of processing documents and transactions reach 20 % of the total shipping costs.

The main threat in freight transportation is the lag in the transmission of digital information from the actual movement of the freight train.

In the paper "Blockchain in Logistics", the authors point out that the main fundamental feature of the introduction of blockchain technology is the supply of uninterrupted flow of information between partners and the improvement of the quality of processes at present. Blockchain increases the degree of trust among all elements of the chain and simplifies the process of making and communicating decisions at every stage by providing one-time access to digital information. [4]

When implementing blockchain technology in the supply chain, the following opportunities will be provided:

- tracking the product from the place of its production to the end consumer, protecting the buyer of the product from non-original goods and fraud;
- dispersion, which makes it possible for all elements of the delivery process to take part in real time: tracking the movement of vehicles or purchased goods, drawing up the required package of documents in the form of smart contracts, destroying illegal elements in the delivery process;
- security through the use of cryptography and the lack of the ability of elements to make changes to the delivery process.

In the study "Creation of a Single Information Space of Digital Logistics Using Databases of Intelligent Transport Systems" Rozhko O.N. describes digital technologies for managing information flows in logistics, noting that traditionally information flows in logistics are managed by various integrated hardware and software systems known as digital control systems. The modern digital management toolkit for a single information space is formed on the basis of:

- – the concept of the *Storage Area Network* (SAN) architecture for exchanging data supported by client file systems attached to storage servers;

- – *Cloud Computing* technologies, which provide customers with secure servers for storing and processing information;

- – *Block Chain* technologies with data storage dispersed on users' devices, the chain of which is available to all *SCM* participants and is protected by cryptographic mechanisms, and only the complete history of data changes is stored. [5]

SAN is a dedicated high-speed network that provides block-level data access for storage. SANs are typically made up of hosts, switches, storage elements, and storage devices that are interconnected using a variety of technologies, topologies, and protocols. The SAN presents storage devices to the host so that the storage appears to be locally attached. This simplified presentation of storage to the host is achieved through the use of various types of virtualization. [6]

Conclusion

The digital logistics technologies considered in this paper can increase and accelerate the interaction between all participants in the supply chains, simplify the processes of transportation, control, and decision-making in emergency situations. Ultimately, all this will reduce the logistics costs included in the cost of the product for the consumer. However, during digitalization, it is necessary to take into account the principles of green logistics to preserve the ecosystem on the planet, security issues of storage and transmission of data of companies and individuals, the possibility of alternative (manual) control of processes in the event of an information system failure.

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WORLD EXPERIENCE IN REGULATION OF AIC AND ITS USE IN THE REPUBLIC OF KAZAKHSTAN**Ualiyeva B.***Al-Farabi Kazakh National University**Doctoral student of High School of economics and business**Khadzhimukan str., 49 - 71, Almaty, Republic of Kazakhstan,*DOI: [10.24412/2701-8369-2021-18-27-31](https://doi.org/10.24412/2701-8369-2021-18-27-31)**МИРОВОЙ ОПЫТ РЕГУЛИРОВАНИЯ АПК И ЕГО ИСПОЛЬЗОВАНИЕ
В РЕСПУБЛИКЕ КАЗАХСТАН****Уалиева Б.Б.***Казахский национальный университета им. Аль-Фараби**докторант Высшей школы экономики и бизнеса**ул. Хаджимукана 49 кв. 71, Алматы, Республика Казахстан***Abstract**

State support of the agro-industrial complex is a prerequisite for effective functioning in most countries. The purpose of writing this article is to study the experience of state support for the agro-industrial complex of developed countries, and to determine which current concept of organizing production support will allow Kazakhstan to dynamically develop the agro-industrial complex. In our opinion, the creation of a digital platform that unites all interested persons will increase business activity in the industry, the investment attractiveness of agribusiness entities, create new tools for interaction between business and government, business and credit organizations, will allow without additional costs from producers of goods and services, improve the standard of living of rural residents, increase the competitiveness of producers by optimizing costs.

Аннотация

Государственная поддержка АПК является предпосылкой для эффективного функционирования в большинстве стран. Цель написания статьи - изучить опыт государственной поддержки агропромышленного комплекса развитых стран, и определить какая актуальная концепция организации поддержки производства позволит Казахстану динамично развивать АПК. На наш взгляд, создание цифровой платформы, объединяющая всех заинтересованных лиц повысит деловую активность в отрасли, инвестиционную привлекательность субъектов агробизнеса, создаст новые инструменты взаимодействия бизнеса и власти, бизнеса и кредитных организаций, позволит без дополнительных затрат со стороны производителей товаров и услуг, повысить уровень жизни сельских жителей, повысить конкурентоспособность производителей за счет оптимизации затрат.

Keywords: agro-industrial complex, governmental support, government regulation, digital platform**Ключевые слова:** агропромышленный комплекс, государственная поддержка, государственное регулирование, цифровая платформа

Во многих странах агропромышленный комплекс является объектом государственного регулирования. Формы государственной поддержки сельского хозяйства должны создавать благоприятные условия для организационно-экономического характера функционирования отечественных товаропроизводителей, в том числе условия для эффективного использования выделенных бюджетных, кредитных и иных финансовых ресурсов, поскольку убыточное состояние многих сельскохозяйственных организаций им не позволяет использовать средства бюджетной поддержки. Как известно, методы государственного регулирования делятся на прямые и косвенные.

Согласно принятой классификации Организации экономического сотрудничества и развития (ОЭСР) прямые меры государственной поддержки включают субсидирование доходов сельхозпроизводителей, к которым относятся: возмещение ущерба от стихийных бедствий; выплаты за ущерб,

связанный с реорганизацией производства; другие прямые компенсационные выплаты.

В системе государственной поддержки развитых стран, как правило, преобладают косвенные меры поддержки, такие как: ценовая и тарифная политика, компенсация текущих затрат, содержание инфраструктуры сельской местности.

В Республике Казахстан существует необходимость в повышении эффективности сельскохозяйственного производства и дальнейшем укреплении существующих связей по мере развития аграрного сектора, а также финансовых и экономических отношений в этом секторе.

В Государственной программе развития агропромышленного комплекса Республики Казахстан на 2017-2021 годы [1] указано, что за период Независимости были разработаны девять программных документов, на основе которых реализовывалась государственная политика в сфере АПК: Программа социально-экономического развития «Аул»

на 1991- 1995 годы и на период до 2000 года, Концептуальная программа развития АПК на 1993-1995 годы и до 2000 года, Программа развития сельскохозяйственного производства на 2000-2002 годы, Государственная агропродовольственная программа на 2003-2005 годы, Государственная программа развития сельских территорий на 2004-2010 годы, Концепция устойчивого развития АПК на 2006- 2010 годы, Программа первоочередных мер по реализации Концепции устойчивого развития АПК РК на 2006-2010 годы, Программа развития АПК на 2010-2014 годы и Программа по развитию АПК в РК «Агробизнес – 2017».

В данной программе отмечено, что в целях увеличения объемов сельхозпроизводства с акцентом на наиболее востребованные виды продуктов питания и развитие экспорта переработанной сельскохозяйственной продукции, в предстоящий период необходимо обеспечить максимальный охват сельхозтоваропроизводителей государственной поддержкой путем создания благоприятных условий и инфраструктуры для производства первичной переработки, хранения и сбыта конкурентоспособной продукции [1].

Особенностью деятельности сельхозпроизводителей является то, что практически каждый из них нуждается и получает в той или иной форме государственную поддержку из бюджетов всех уровней, как и в любой другой экономически развитой стране. Эффективное использование бюджетных средств, выделяемых на поддержку сельского хозяйства, имеет особое значение в сложных экономических условиях. Чрезвычайно важно не только выделить господдержку, но и эффективно использовать его в каждом из регионов Казахстана.

В 2021 году в период пандемии COVID-19, программа государственной поддержки сельхозпроизводителей в РК состояла из следующих мер:

- освобождение производителей сельскохозяйственной продукции от земельного налога на земли сельскохозяйственного назначения до 31 декабря 2020 г.;
- приостановление начисления пени по неисполненным в срок налоговыми обязательствам до 15 августа 2020 года и перенос срока сдачи налоговой отчетности на 3 квартал 2020 г.;
- включение в перечень импортируемых товаров, по которым НДС уплачивается методом зачета, крупного рогатого скота и племенных цыплят;
- установление ставки НДС по социально-значимым продовольственным товарам в размере 8% до 1 октября 2020 г.;
- вместе с тем для всех субъектов малого и среднего бизнеса предоставлена отсрочка по уплате налогов и социальных платежей до 1 июня 2020 г., а также приостановлены все меры принудительного взимания налоговой и таможенной задолженности;
- на период с 01.01.20-01.01.23 гг. лица, применяющие специальные налоговые режимы и признаваемые субъектами микропредпринимательства или малого предпринимательства, в том числе плательщики единого земельного налога освобождены от уплаты налогов на доходы (статья 57-4 Закона РК «О введении в действие Кодекса Республики

Казахстан «О налогах и других обязательных платежах в бюджет» (Налоговый кодекс). [2].

Увеличение объемов господдержки позволит хозяйствам динамично развиваться, постепенно обновлять парк сельхозтехники, внедрять современные технологии, укреплять кормовую базу и увеличивать поголовье сельскохозяйственных животных.

Но, несмотря на положительные сдвиги в АПК Казахстана имеются еще и негативные тенденции развития. Одной из основных причин сложившейся ситуации является неразвитость системы заготовки и продвижения сельскохозяйственной продукции от производителя к рынкам сбыта, включая предприятия по переработке сельскохозяйственного сырья. Усиление роли посредников в реализационной сети практически полностью исключило взаимосвязь производителей и переработчиков сырья. Низкие закупочные цены на сельскохозяйственную продукцию не стимулируют увеличение объемов их производства, что в итоге ведет к низкой доле переработки сельскохозяйственного сырья, недозагруженности мощностей перерабатывающих предприятий и в конечном счете к высокой доле импорта продовольственных товаров. Следовательно, необходимы эффективные средства государственной поддержки, что не всегда проявляется только в экономическом росте. Для решения данной проблемы по опыту развитых стран необходимо внедрение цифровых платформ в АПК.

До принятия в октябре 2015 года Закона РК «О сельскохозяйственных кооперативах» действовали две модели механизма государственной поддержки развития сельской кооперации:

- по линии Министерства сельского хозяйства РК через АО «Аграрная кредитная корпорация» путем предоставления льготного кредитования под 5% на 5-7 лет на создание сельского потребительского кооператива;

- по линии региональных АО «НК «Социально-предпринимательская корпорация» («Оңтүстік», «Жетысу», «Ертыс», «Тобол», «Батыс», «Сары-Арка», «Каспий») путем создания сервисно-заготовительных центров по предоставлению агросервисных услуг сельским потребительским кооперативам [1].

Однако, несмотря на предпринятые меры государственной поддержки, сельская кооперация не получила должного развития. Анализ позволил выявить основные проблемы, сдерживающие их развитие:

- недоверие сельхозпроизводителей и сельского населения к кооперированию из-за недостаточной работы по разъяснению преимуществ кооперации и механизмов функционирования кооперативов;

- низкая профессиональная подготовка управленческого персонала и недостаток специалистов;

- недостаточное стимулирование государством процессов кооперирования;

- нарушение основных кооперативных принципов (добровольность, демократичность, 1 член = 1 голос и др.);

-создание «лжекооперативов» в интересах одного крупного хозяйства, которое является инициатором, залогодателем, фактически собственником кооператива, распорядителем всей прибыли от деятельности кооператива, поскольку именно это хозяйство осуществляет закуп и сбыт продукции;

-недостаточное или неликвидное залоговое обеспечение;

-отсутствие стимулирования объединения сельхозпроизводителей в сельскохозяйственные кооперативы, в частности, отсутствие возможности распределения чистого дохода кооператива между его членами в связи с некоммерческим статусом кооператива [1].

Как показывает опыт развитых государств, сельское хозяйство является объектом государственного регулирования. Будущее сельских территорий ЕС обусловлено быстрыми изменениями в социальной и экономической эволюции во всем мире, а также экономической политикой, основанной на региональной интеллектуальной специализации или, другими словами, в пользу самых крупных урбанизированных территорий с точки зрения обеспечения продовольствием, среди прочего. Поскольку сельское хозяйство остается основным источником занятий землепользованием, развитие сельского хозяйства в идеале должно осуществляться рядом с городом, сопровождаемым распространением новых моделей, таких как короткие производственно-сбытовые цепочки или местное производство продуктов питания. [3]. В Европе созданы социально-экономические условия для реализации модели биоэкономики, которая внедряет инновации за счет применения агроэкологических знаний. В частности, сельские районы должны вводить новшества в организационной, социальной и институциональной областях, основываясь на конкретных экологических ресурсах и обновленных связях между местными жителями - субъектами в рамках локализованных агропродовольственных систем. Фермеры должны участвовать в моделях совместного производства знаний (с участием ученых, практиков, предприятий, землеустроителей и потребителей), чтобы повысить уровень кооперативного производственного поведения и развития мощных местных сетей, направленных на более широкое вовлечение и вовлечение местного населения в процессы принятия решений [4].

Анализ методологии и нормативной базы государственной аграрной политики США позволил выявить следующие ключевые характеристики.

1. Концептуальные основы устойчивости. Рост производительности в сельскохозяйственном секторе США имеет решающее значение для развития мировых рынков. Такой подход можно увидеть в положениях стратегии, которые включают: обеспечение высокого качества питания и для жителей США, как обеспечение продовольствием населения во всем мире; рост благосостояния в сельских районах, увеличение государственных инвестиций в развитие сельских районов; обеспечение доступа детей к безопасному и сбалансированному питанию и т. д.

2. Развитые инструменты финансирования деятельности и поддержки доходов товаропроизводителей. Прямое финансирование включает: страхование сельскохозяйственных рисков и потери стоимости; страхование органического растениеводства; льготное кредитование фермерских хозяйств и предоставление грантов; сопровождение в закупке услуг по закупке семян, удобрений, скота, кормов, оборудования; предоставление прямых кредитов сельским общинам для развития инфраструктуры.

3. Ориентация на многофункциональное сельское хозяйство как основу для достижения цели устойчивого развития. Было обнаружено, что многофункциональное сельское хозяйство способствует сохранению экосистем и ограничивает влияние глобальных пищевых цепочек за счет прямых продаж сельскохозяйственной продукции. При этом следует учитывать, что переход на виды деятельности, не предусматривающие производство продукции, при отсутствии разумного планирования может привести к убыточности отрасли целого региона или района.

4. Сотрудничество товаропроизводителей в рамках программ маркетинга, производства и продаж. Кооперативы в Соединенных Штатах создаются для удовлетворения потребностей в тех ресурсах и услугах, рынок которых не функционирует эффективно. Несмотря на сокращение численности, их преимущества остаются очевидными при решении следующих задач: адресное государственное финансирование; обеспечение исследований и разработок в целях устойчивого развития; создание и ведение базы знаний участников; техническая помощь; и противодействие монополии и устранение диспропорций в ценах в пищевой цепочке.

5. Эффективное ценообразование на основе паритетного мониторинга. Мониторинг осуществляется путем расчета получаемых сельхозпроизводителями индексов цен на реализованную продукцию, индекса цен на средства производства и индекса паритета. Также Агентство по управлению рисками выполняет прогнозирование ценовой ситуации на рынках, а результаты используются при расчете страховых выплат, покрытия доходов сельхозпроизводителей и цен фьючерсных контрактов.

6. Стабилизация рынка на основе биржевых и внебиржевых инструментов. Установлено, что до начала мирового продовольственного кризиса 2007-2008 гг. и 2010-2011 гг. там была тенденция к либерализации и сокращению регулирующей функции государства, что делало практически невозможным быструю стабилизацию ситуации и приводило к экономическим и социальным потерям. В связи с этим система регулирующих органов в США в настоящее время укрепляется во всех областях, включая: обеспечение прозрачности нормативной базы и методологии; обеспечение доступности необходимой рыночной информации для субъектов предпринимательства; производственное планирование; усиление полномочий регулирующих органов. В рамках биржевого регулирования

устанавливаются общие правила доступа, осуществляется мониторинг и прогнозирование фьючерсных контрактов и цен, выявляется влияние спекулятивных сделок. Внебиржевые сделки и товарные свопы стандартизированы и выполняются на специализированных зарегистрированных платформах. Существенными недостатками регулятора являются: усиление влияния финансовых рынков и инвестиций на цены товарных фьючерсных контрактов, а также разрыв в стоимости фьючерсных и денежных операций, искажающий процесс ценообразования.

7. Регулирование рынка скоропортящихся товаров. Закон о скоропортящихся сельскохозяйственных товарах запрещает недобросовестную и мошенническую практику при продаже скоропортящихся товаров, регулируя деятельность грузоотправителей, дистрибьюторов и розничных торговцев. Это гарантирует, что сельхозпроизводители работают в партнерстве с обрабатывающей промышленностью и практикуют справедливую торговлю посредством обучения, посредничества, арбитража, лицензирования и правоприменения. Частью этого механизма является практика долгосрочных маркетинговых соглашений, которые инициируются отраслью для обеспечения стабильных поставок молока, фруктов, овощей и являются обязательным регулятором для всей отрасли в регионе. В рамках долгосрочных договоров обеспечивается поддержание высокого качества продукции; стандартизация упаковки; создание программ хранения резервных копий; маркетинговые исследования и разработка рекламы.

8. Информационная поддержка экспорта сельскохозяйственной продукции и продуктов питания, которая предусматривает: обеспечение прозрачности ситуации (прогнозы экспорта и импорта по странам и секторам; мультипликаторы торговли сельскохозяйственной продукцией, которые обеспечивают оценку влияния на занятость и прибыльность смежные отрасли; данные о ценах и объемах импорта, а также происхождении); мониторинг критериев безопасности и качества продукции, ввозимой в США; мониторинг двусторонних и многосторонних торговых соглашений и использования выгод.

Реализация программы поддержки сельского хозяйства осуществляется по трем направлениям:

- прямые, кредитные и циклические платежи: прямые платежи - размер фиксированных платежей, не влияющих на уровень цен;

- платежи по кредиту - платежи по обеспечению, которые производятся, когда ставки по обеспечению выше уровня рыночных цен;

- циклические платежи - если рыночная цена ниже уровня цен, установленного государством, сельхозпроизводители получают дополнительный доход.

Государство пересматривает аграрную политику страны примерно раз в пять лет. Эта программа координируется Министерством сельского хозяйства США и Конгрессом США. В дискуссии

также принимают участие фермеры и представители агропромышленного комплекса. «Стабилизация доходов фермеров» - одна из важнейших сельскохозяйственных программ. По программе выделяется 30-50% бюджета на финансирование аграрного сектора. Еще одна форма поддержки агропромышленного комплекса страны - льготное налогообложение фермеров. Это означает, что предоставляются налоговые скидки, снижается уровень налогообложения, а стоимость сельхозтехники снимается с налоговой базы. В зарубежных странах система страхования играет особую роль. Страхование не является субсидией, но тем не менее представляет собой значительную поддержку для фермеров. Сельхозпроизводители платят налог не с дохода, а с прибыли. Мелкие фермеры не могут конкурировать с крупными коммерческими фермами. Поэтому правительство США предлагает ограничить субсидии крупным производителям, которые получают не менее 75% своих доходов от сельского хозяйства. В США лидируют субсидии на производство молока. Это способствует увеличению доходов молочной отрасли и созданию крупнейших в мире молочных ферм. На территории более 40 тысяч молочных ферм страны, где содержится около 9 миллионов голов крупного рогатого скота и производится около 100 миллионов тонн молока. Несмотря на сокращение поголовья крупного рогатого скота (КРС) и количества ферм, производство молока увеличивается примерно на 1,5% ежегодно за счет увеличения продуктивности КРС. Крупнейшие компании США в области сельского хозяйства стремятся создать систему «умного» сельского хозяйства, то есть цифровизации, которая основана на сборе и обработке информации о почвенных условиях, климатических условиях и т. д.

Для объединения всех заинтересованных лиц необходимо создание цифровой платформы. Цифровая платформа – это организационно-техническая система, работающая на принципах виртуальной организации, объединяющая предприятия, организации, индивидуальных предпринимателей, сообщества и государственные органы, непосредственно связанные с агропромышленным комплексом. Программа цифровизации будет реализована в виде специального веб-портала в сети Интернет, содержащего классификатор по типу объектов, полнотекстовый поиск, описание объектов с фотографиями, видеоматериалы и обзоры, статистику важнейших социально-экономических показателей. Каждое сельскохозяйственное предприятие, зарегистрированное на веб-портале цифровой платформы, получает уникальное имя пользователя и пароль для дальнейшей идентификации в сети. Цифровые платформы облегчают процессы принятия решения как производственных, так и экономических задач агропромышленного сектора экономики посредством коммуникаций между субъектами системы [5].

Для решения насущных проблем АПК Республике Казахстан необходимо изучить опыт США и других передовых государств, что позволит внести

коррективы в государственную поддержку агропромышленного комплекса. Сельское хозяйство должно оставаться приоритетом в государственном регулировании. Для решения проблем финансирования сельскохозяйственных предприятий необходимо поставить новые задачи и принципы экономической политики государства, обеспечить благоприятный инвестиционный климат.

Мировой опыт показывает, что развитие сельского хозяйства возможно только при широком внедрении инноваций и модернизации производства. Наиболее эффективные агротехнические механизмы используются в зарубежной практике. Поэтому для РК использование инструментов из зарубежного опыта играет важную роль.

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MATHEMATICAL SCIENCES

PASCAL – LIKE GOLDEN RATIO NUMBER TRIANGLE

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Abstract

Among several amusing real numbers that we know Golden Ratio plays an important role both in mathematics as well as in other branches of science and technology. In this paper, I have introduced a number triangle consisting of Golden Ratio and whose elements are constructed using the concept analogous to Pascal's triangle. With this simple construction, I had proved five new and interesting results which will add more glory upon understanding Golden Ratio.

Keywords: Golden Ratio, Binomial Coefficients, Pascal – Like Number Triangle, Centred Numbers, Hockey Stick Property.

1. Introduction

The concept of Golden Ratio and other metallic ratios has been study of great interest among amateur as well as well trained mathematicians for several centuries. Hundreds of books and research articles have been published about metallic ratios in general and Golden Ratio in particular. The idea of Golden Ratio has emerged from ancient times and continues to inspire several mathematicians and students even today. In this paper, I will construct a simple number triangle using Golden Ratio and generate new entries of the triangle using a rule similar to that of constructing Pascal's triangle. This new triangle turns out to have very interesting mathematical properties which will be proved in this paper.

2. Definitions

2.1 Golden Ratio is a real number defined to be the positive real root of the quadratic equation $x^2 - x - 1 = 0$. If we denote the Golden Ratio by φ then we notice that the roots of the equation $x^2 - x - 1 = 0$ are given by $\varphi = \frac{1+\sqrt{5}}{2}$ (2.1) and

$$1 - \varphi = \frac{1 - \sqrt{5}}{2} \quad (2.2).$$

$$\varphi^2 = \varphi + 1$$

2.2 The entries of the well known Pascal's triangle are known as binomial coefficients since they form coefficients of the binomial expansion $(a+b)^n$. The binomial coefficients are given by
$$\binom{n}{r} = \frac{n!}{r! \times (n-r)!} \quad (2.3).$$
 Note that $\binom{n}{r} = 0$ if either $r < 0$ or $r > n$.

3. Construction of Number Triangle

In this section, I construct a number triangle analogous to the construction of Pascal's triangle but using Golden Ratio. We assume the row number to be n and let $t_{n,m}$ be the n th row, m th position entry in such number triangle where n, m are natural numbers and $1 \leq m \leq n$. With these assumptions the following number triangle is constructed which, I call as Pascal – Like Golden Ratio Number Triangle.

$$\begin{array}{ccccccc}
 & & & & 1 & & \\
 & & & & & & \\
 & & & 1 & & \varphi & \\
 & & 1 & & 1+\varphi & & \varphi \\
 & 1 & & 2+\varphi & & 1+2\varphi & & \varphi \\
 & & \searrow \swarrow & \searrow \swarrow & \searrow \swarrow & & \\
 & 1 & & 3+\varphi & & 3+3\varphi & & 1+3\varphi & & \varphi \\
 & & \searrow \swarrow & \searrow \swarrow & \searrow \swarrow & \searrow \swarrow & & \\
 & 1 & & 4+\varphi & & 6+4\varphi & & 4+6\varphi & & 1+4\varphi & & \varphi \\
 & 1 & & 5+\varphi & & 10+5\varphi & & 10+10\varphi & & 5+10\varphi & & 1+5\varphi & & \varphi \\
 & \dots & & \dots & & \dots & & \dots & & \dots & & \dots & & \dots
 \end{array}$$

Figure 1: Pascal – Like Golden Ratio Number Triangle

We notice that from second row, but for initial and final entry which are 1 and φ , each entry is sum of two previous row entries (as indicated by arrows in third, fourth and fifth rows). This rule is analogous to the construction of Pascal's triangle. In fact, the n th row, m th position entry of Pascal – Like Golden Ratio number triangle in

Figure 1 is given by $t_{1,1} = 1$ and for $n \geq 2, 1 \leq m \leq n$ we have $t_{n,m} = \binom{n-2}{m-1} + \binom{n-2}{m-2} \varphi$ (3.1).

From (3.1), for all $n \geq 2$ we see that $t_{n,1} = \binom{n-2}{0} + \binom{n-2}{-1} \varphi = 1$, $t_{n,n} = \binom{n-2}{n-1} + \binom{n-2}{n-2} \varphi = \varphi$

In upcoming sections, I will prove some of the interesting properties related to Pascal – Like Golden Ratio Number triangle introduced in this paper.

4. Theorem 1 (Row Sum Property)

For $n \geq 2$ the row sum of Pascal – Like Golden Ratio Number triangle is $2^{n-2} \varphi^2$.

That is, $\sum_{m=1}^n t_{n,m} = 2^{n-2} \varphi^2$ (4.1), $n \geq 2$.

Proof: By (3.1) and using the identity $\sum_{r=0}^n \binom{n}{r} = 2^n$, for $n \geq 2$, we have

$$\begin{aligned} \sum_{m=1}^n t_{n,m} &= \sum_{m=1}^n \left[\binom{n-2}{m-1} + \binom{n-2}{m-2} \varphi \right] = \sum_{m=1}^n \binom{n-2}{m-1} + \varphi \sum_{m=1}^n \binom{n-2}{m-2} \\ &= \left[\binom{n-2}{0} + \binom{n-2}{1} + \binom{n-2}{2} + \cdots + \binom{n-2}{n-2} + \binom{n-2}{n-1} \right] \\ &\quad + \varphi \left[\binom{n-2}{-1} + \binom{n-2}{0} + \binom{n-2}{1} + \cdots + \binom{n-2}{n-3} + \binom{n-2}{n-2} \right] \\ &= \sum_{r=0}^{n-2} \binom{n-2}{r} \times (1 + \varphi) = 2^{n-2} \varphi^2 \end{aligned}$$

This completes the proof.

5. Theorem 2 (Alternate Sum Property)

For $n \geq 3$ the alternating sum of row entries of Pascal – Like Golden Ratio Number triangle is zero. That is,

$$\sum_{m=1}^n (-1)^{m-1} t_{n,m} = 0 \quad (5.1), \quad n \geq 3.$$

Proof: Using (3.1) and the fact that sum of alternate binomial coefficients is zero, we have

$$\begin{aligned} \sum_{m=1}^n (-1)^{m-1} t_{n,m} &= \sum_{m=1}^n (-1)^{m-1} \left[\binom{n-2}{m-1} + \binom{n-2}{m-2} \varphi \right] = \sum_{m=1}^n (-1)^{m-1} \binom{n-2}{m-1} + \varphi \sum_{m=1}^n (-1)^{m-1} \binom{n-2}{m-2} \\ &= \left[\binom{n-2}{0} - \binom{n-2}{1} + \binom{n-2}{2} - \cdots + (-1)^{n-2} \binom{n-2}{n-2} + 0 \right] \\ &\quad + \varphi \left[0 - \binom{n-2}{0} + \binom{n-2}{1} - \cdots + (-1)^{n-2} \binom{n-2}{n-3} + (-1)^{n-1} \binom{n-2}{n-2} \right] \\ &= 0 - \varphi \times 0 = 0 \end{aligned}$$

This completes the proof.

6. Theorem 3

The centred numbers of Pascal – Like Golden Ratio Number triangle is given by

$$t_{2k-1,k} = \binom{2k-3}{k-1} \varphi^2 \quad (6.1), \quad k \geq 2$$

Proof: The centred numbers of Pascal – Like Golden Ratio number triangle are numbers of the form $t_{2k-1,k}$

. Now using (3.1), we have

$$\begin{aligned} t_{2k-1,k} &= \binom{2k-3}{k-1} + \binom{2k-3}{k-2} \varphi = \binom{2k-3}{k-1} + \binom{2k-3}{k-1} \varphi \\ &= \binom{2k-3}{k-1} (1 + \varphi) = \binom{2k-3}{k-1} \varphi^2 \end{aligned}$$

This completes the proof.

7. Theorem 4

For $n \geq 2$, the sum of squares of n th row entries of Pascal – Like Golden Ratio Number triangle is given by

$$\sum_{m=1}^n t_{n,m}^2 = \left[\binom{2n-3}{n-2} + \binom{2n-4}{n-3} \right] \varphi + 2 \binom{2n-4}{n-2} \quad (7.1)$$

Proof: To prove (7.1) we make use of following two identities related to binomial coefficients and use (3.1).

$$\begin{aligned} \sum_{k=0}^n \binom{n}{k}^2 &= \binom{2n}{n}, \quad \sum_{k=1}^n \binom{n}{k-1} \binom{n}{k} = \binom{2n}{n-1} \\ \sum_{m=1}^n t_{n,m}^2 &= \sum_{m=1}^n \left[\binom{n-2}{m-1} + \binom{n-2}{m-2} \varphi \right]^2 \\ &= \sum_{m=1}^n \binom{n-2}{m-1}^2 + \sum_{m=1}^n \binom{n-2}{m-2}^2 \varphi^2 + 2\varphi \sum_{m=1}^n \binom{n-2}{m-2} \binom{n-2}{m-1} \\ &= \sum_{k=0}^{n-2} \binom{n-2}{k}^2 + \sum_{k=0}^{n-2} \binom{n-2}{k}^2 \varphi^2 + 2\varphi \sum_{k=1}^{n-2} \binom{n-2}{k-1} \binom{n-2}{k} \\ &= \binom{2n-4}{n-2} + \binom{2n-4}{n-2} \varphi^2 + 2\varphi \binom{2n-4}{n-3} \\ &= \binom{2n-4}{n-2} + \binom{2n-4}{n-2} (\varphi + 1) + 2\varphi \binom{2n-4}{n-3} \\ &= \left[\binom{2n-4}{n-3} + \binom{2n-4}{n-2} + \binom{2n-4}{n-3} \right] \varphi + 2 \binom{2n-4}{n-2} \\ &= \left[\binom{2n-3}{n-2} + \binom{2n-4}{n-3} \right] \varphi + 2 \binom{2n-4}{n-2} \end{aligned}$$

This completes the proof.

8. Theorem 5 (Hockey Stick Property)

$$\sum_{r=m}^n t_{r,r-m+1} = t_{n+1,n-m+1} \quad (5.1)$$

Proof: For proving (5.1), we make use of the identity $\sum_{k=0}^r \binom{n+k}{k} = \binom{n+r+1}{r}$ (for proof see [3]) and

(3.1), to get

$$\begin{aligned}
\sum_{r=m}^n t_{r,r-m+1} &= \sum_{r=m}^n \left[\binom{r-2}{r-m} + \binom{r-2}{r-m-1} \right] \varphi \\
&= \left[\binom{m-2}{0} + \binom{m-1}{1} + \binom{m}{2} + \cdots + \binom{n-3}{n-m-1} + \binom{n-2}{n-m} \right] + \\
&\quad \left[\binom{m-2}{-1} + \binom{m-1}{0} + \binom{m}{1} + \binom{m+1}{2} + \cdots + \binom{n-3}{n-m-2} + \binom{n-2}{n-m-1} \right] \varphi \\
&= \sum_{k=0}^{n-m} \binom{m-2+k}{k} + \left[\sum_{k=0}^{n-m-1} \binom{m-1+k}{k} \right] \varphi \\
&= \binom{n-1}{n-m} + \binom{n-1}{n-m-1} \varphi = t_{n+1,n-m+1}
\end{aligned}$$

This completes the proof.

9. Conclusion

In this paper, after introducing number triangle containing Golden Ratio and constructed with a rule similar to that of in Pascal's triangle, I had proved five interesting new results. In particular, the row sum of the entries of the Pascal – Like Golden Ratio Number triangle is the product of power of two and square of Golden ratio as proved in (4.2) of theorem 1. Similarly, from third row onwards, I had proved that the alternate sum of entries of Pascal – Like Golden Ratio Number triangle is always 0 through (5.1) of theorem 2. In theorem 3, I had obtained a compact formula for determining centred numbers and in theorem 4, I had obtained an expression for determining the sum of squares of entries of Pascal – Like Golden Ratio Number triangle.

Finally, using the hockey stick property of binomial coefficients in usual Pascal's triangle, in theorem 5, I had established the hockey stick property for m th slant South – East diagonal entries of Pascal – Like Golden Ratio Number triangle. These new results would be additional resource towards exploring the fascinating Golden Ratio.

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MEDICAL SCIENCES

FEATURES OF THE FAMILY ENVIRONMENT IN ADOLESCENTS HOSPITALIZED BY EMERGENCY PSYCHIATRIC TEAMS IN CONNECTION WITH INCOMPLETE SUICIDAL ATTEMPTS

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ОСОБЕННОСТИ СЕМЕЙНОГО ОКРУЖЕНИЯ У ПОДРОСТКОВ, ГОСПИТАЛИЗИРОВАННЫХ БРИГАДАМИ СКОРОЙ ПСИХИАТРИЧЕСКОЙ ПОМОЩИ В СВЯЗИ С НЕЗАВЕРШЕННЫМИ СУИЦИДАЛЬНЫМИ ПОПЫТКАМИ

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Abstract

The article discusses the issues of suicidal behavior and mental pathology in adolescents 15-17 years old, features of the microsocial environment

Аннотация

В статье обсуждаются вопросы суицидального поведения и психическая патология у подростков 15-17 лет, особенности микросоциальной среды

Keywords: adolescents, suicidal attempts, family environment

Ключевые слова: подростки, суицидальные попытки, семейная среда

Считается, что в мире от самоубийств погибает больше людей, чем во всех конфликтах. А по данным ВОЗ количество случаев суицида за последние 50 лет выросло на 60%. Так согласно опубликованному в 2014 году докладу ВОЗ вследствие самоубийства каждые 40 секунд погибает человек. По сведениям Росстата, в 2017 году общий коэффициент смертности по причине самоубийства для всех возрастов, рассчитываемый на 100 000 населения, составил 16, но среди подростков 15-19 лет этот показатель выше. К факторам риска совершения суицидов у подростков принято относить комплекс разнообразных показателей (наследственность, пол, психическое здоровье, возраст, стрессовые события), в том числе социальные – семейные, средовые, культуральные. Для юных суицидентов весьма значимыми факторами являются межличностное насилие и употребление психоактивных веществ [1]. Полагают, что через самоповреждение подросткам удастся повысить контроль над собственными эмоциями и таким способом улучшить психологическое самочувствие на непродолжительное время [2]. При этом наиболее распространенными ситуациями, способствующим манифестации аутоагрес-

сивного поведения у несовершеннолетних, согласно некоторым исследованиям, являются тяжелые конфликты с родителями [3,4]

Целью исследования было получение данных об особенностях микросоциального окружения у подростков, совершивших суицидальную попытку и госпитализированных в психиатрический стационар бригадами скорой психиатрической помощи.

Материал и методы: юноши и девушки 15-17 лет (143 чел. – 88 дев. и 55 юн.), проходившие стационарное лечение в связи с суицидальным поведением. Основным методом исследования – клинико-психопатологический, учитывались анамнестические сведения, данные медицинской документации.

Результаты. На момент госпитализации средний возраст пациентов составлял 16,6 года. Суицидальное поведение наиболее часто имело место в возрастном интервале от 16 до 18 лет, на который приходилось 83,5% суицидальных попыток. Данные нозологического распределения в группе подростков обоего пола были следующими: наибольшую долю составляли больные с психогенными реакциями в рамках расстройств адаптации (F4) – 28,7%, на втором месте с незначительным отставанием находились подростки с формирующимся расстройством личности (F6) – 26,6%, третье место

занимали в два раза реже встречающиеся расстройства шизофренического спектра (F2) – 13,3%. Далее в убывающем порядке следовали органические непсихотические расстройства (F0) – 11,1%, аффективные расстройства настроения (F3) – 10,5%, последние места принадлежали таким диагностическим категориям, как поведенческие и эмоциональные расстройства с началом в детском и подростковом возрасте (F9) – 5,6% и умственная отсталость (F7) – 4,2%. (Гендерное распределение несколько различалось в зависимости от нозологии). Следует подчеркнуть, что преобладали подростки с пограничными психическими расстройствами (89,5%), и лишь у 10,5% несовершеннолетних суицидальная активность отмечалась на фоне психотического состояния. Психические расстройства считаются одним из значимых факторов, predisponирующих к суициду, в наших наблюдениях тяжелая психическая патология не играла главенствующую роль в суицидальном поведении большинства подростков, наиболее часто оно идентифицировалось в рамках психогенной реакции, дезадаптации личности в условиях конфликта. Более чем у половины больных (55,3%) провоцирующим импульсивную суицидальную реакцию фактором служил конфликт с родителями или замещающими их лицами. Как известно, именно семья является важнейшей социальной средой, в которой происходит становление личности, формируется умение противостоять внешним стрессовым обстоятельствам.

Анализ микросоциальной ситуации показал, что у большинства (в 2/3 случаев) подростков с суицидальными проявлениями внутрисемейные условия представлялись неблагоприятными. Более половины подростков воспитывались в неполных семьях, либо проживали в интернате для сирот или приемных семьях (59,5%), в том числе в асоциальных с неблагоприятным микроклиматом. Отношения в семье даже с двумя родителями нередко были конфликтными, сопровождалась ссорами или драками, иногда имело место делинквентное поведение родителей. Систематическое пьянство, употребление ПАВ одного или обоих родителей отмечалось в семье у 30,4% несовершеннолетних, в некоторых случаях алкоголизм носил семейный характер. Среди родственников подростков выявлялись случаи разнообразной психической патологии и завершённые суициды (у 13,9% больных). В большей части случаев (67,8%) тип эмоционального взаимодействия подростка с родителями или замещающими их взрослыми можно было охарактеризовать как отчужденный и холодный, отношения с матерью могли быть напряженными и враждебными (у 28,1%). Таким образом, семейная среда, в условиях которой происходил процесс взросления, затрудняла становление у подростков гармоничной идентичности, не формировался опыт конструктивного и терпеливого преодоления трудностей. В анамнезе 85,5% юношей-суицидентов выявлялись

разнообразные поведенческие девиации – употребление алкоголя, ПАВ, ранние и беспорядочные половые связи, эпизоды воровства, прогулы, уходы из дома, агрессивное поведение, группирование с асоциальными сверстниками. Раннее обогащение сексуальным опытом, частая смена партнеров, а в некоторых случаях – даже заражение венерическими болезнями наблюдались почти у половины (42%) девушек. Нередким было сочетание аутоагрессивных девиаций и аддиктивных расстройств: более половины юношей (58,2%) и девушек (63,6%) угрожали и реализовывали аутодеструктивные намерения в состоянии алкогольного или наркотического опьянения.

Выводы. Проведенное исследование позволяет увидеть, что деструктивная семейная среда способствует с большой вероятностью становлению у подростков дезадаптивных (с ограниченным репертуаром способов противостояния трудностям) типов реагирования на психологические проблемы, ориентированных прежде всего на достижение быстрого разрешения эмоционального дискомфорта – импульсивному суицидальному поведению и аддиктивным нарушениям. Таким образом, исследование особенностей семейных отношений подростков с аутоагрессивными проявлениями и разработка специализированных психосоциальных интервенций является актуальной задачей клиницистов. Вектор внимания специалистов в области профилактики суицидального поведения в подростковой среде – психотерапевтов, психологов, психиатров, наркологов, – должен быть направлен на помощь в обретении смысла жизни, формировании адекватных копинг-стратегий и умения сопротивляться негативным обстоятельствам среды.

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COMPARATIVE ANALYSIS OF APPROACHES TO THE TREATMENT OF ALCOHOL DEPENDENCE IN THE USA AND IN REPUBLIC OF KAZAKHSTAN**Sabyrova M.***Resident of psychiatry Medical University Semey,
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г. Семей, кандидат медицинских наук (к.м.н.), врач психиатр,
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In this article, we tried to analyze the approaches to the treatment of alcohol dependence in the world and in Kazakhstan. The main goal was to identify similarities and differences in the provision of care for patients with alcoholism. Relevance: Alcoholism is an acute problem in the modern world. According to the Ministry of National Economy of the Republic of Kazakhstan, due to the onset of the coronavirus pandemic, the number of people who drink alcohol in the Republic of Kazakhstan increased from 21.5% to 35.7% in November-January 2020 compared to 2018-2019. The article describes the methods of treating alcoholism and their effectiveness, according to the sources found, also describes a new method of treating alcohol dependence using gene therapy.

Аннотация

В данной статье мы попытались провести анализ подходов к лечению алкогольной зависимости в мире и в Казахстане. Основной целью было выявить схожесть и различие в оказании помощи пациентам с алкоголизмом. Актуальность: Алкоголизм является острой проблемой современного мира. По данным МНЭ РК в связи с началом пандемии коронавирусной инфекции количество лиц, употребляющих алкоголь в Республике Казахстан выросло с 21.5 % до 35,7 % в ноября-январе 2020 года по сравнению с 2018-2019 годами. В статье описываются методы лечения алкоголизма и их эффективность, согласно найденным источникам, также описывается новый метод лечения алкогольной зависимости с помощью генной терапии.

Keywords: alcoholism, disulfiram, hypnotherapy.**Ключевые слова:** алкоголизм, дисульфирам, гипнотерапия.

Введение: «...Алкоголизм – это заболевание, которое характеризуется возникновением изменения толерантности организма, непреодолимого патологического влечения к спиртным напиткам, проявлениями алкогольного абстинентного (похмельного) синдрома и развитием алкогольной деградации личности.». Алкоголизм является огромной проблемой, пути к решению которой ищут во всем мире. Синдром зависимости: сочетание физиологических, поведенческих и когнитивных явлений, при которых употребление алкоголя начинает занимать первое место в системе ценностей индивидуума.[1]

Цель работы: Проведение сравнительного анализа подходов к лечению алкогольной зависимости в мире и в Казахстане, провести параллель в подходах лечения и оценить эффективность терапии алкогольной зависимости.

Задачи:

1. Сравнительный анализ подходов к лечению алкогольной зависимости в мире и в Казахстане

2. Провести параллель в подходах лечения и оценить эффективность терапии алкогольной зависимости.

3. Описать новые и экспериментальные методы лечения алкоголизма.

Методы исследования: анализ, имеющейся информации.

Актуальность: Алкоголизм является острой проблемой современного мира. По данным МНЭ РК в связи с началом пандемии коронавирусной инфекции количество лиц, употребляющих алкоголь в Республике Казахстан выросло с 21.5 % до 35,7 % в ноября-январе 2020 года по сравнению с 2018-2019 годами. Согласно Государственной программе развития здравоохранения Республики Казахстан 20020-2025 планируется снизить употребление алкоголя до 15.6% в год. В сравнении по данным Министерства Здравоохранения США каждый

12 совершеннолетний американец является зависимым от алкоголя. По подсчётам Администрации Безопасности Дорожного Движения, по причине употребления спиртных напитков умерло порядка 18 тысяч человек.

Термин «хронический алкоголизм» был впервые применён в 1849 году шведским врачом и общественным деятелем М. Гуссом (M. Hüss), обозначившим так совокупность патологических изменений, происходящих в организме человека при длительном, неумеренном употреблении спиртных напитков. В XIX и начале XX веков алкогольная зависимость в целом называлась *дипсомания*, но сейчас этот термин имеет иной смысл. Алкоголизм был утверждён ВОЗ как болезнь в 1952 году. Лечение алкоголизма состоит из купирования острых алкогольных расстройств и противорецидивной терапии, т.е. это характерно для любой страны. В США существуют два пути по которым может пойти человек с зависимостью от алкоголя -это лечение в частной клинике(реабилитационном центре) и федеральные закрытые центры. В Казахстане это наркологические реабилитационные центры. В протоколе диагностики и лечения РЦРЗ в 1 этап лечения алкогольной зависимости включают детоксикацию и лечение абстинентного синдрома. Для сопутствующих аффективных расстройств применяются антиконвульсанты бензодиазепинового ряда (карбамазепин, диазепам), в редких случаях используют нейролептики и антидепрессанты. В качестве терапии астенического синдрома применяются пирацетам, депротеинизированный гемодериват из телячьей крови и комплекс пептидов, полученных из головного мозга свиньи. В свою очередь, хочется отметить, что на территории США ноотропы не применяются, более того они не одобрены FDA и зарегистрированы как БАДы. На 2 этапе лечения проводятся противорецидивные мероприятия психотерапевтического характера. Согласно исследованиям господина Храмцова В.В. в его статье «Психокоррекция алкогольной зависимости»: «...Среди прошедших курс психотерапии пациентов количество ремиссий длительностью 12 месяцев составило 78 человек, что составляет 83,5% выборки, ремиссия длительностью 24 месяца наблюдается у 71 человека, что составляет 76% выборки.» [3]. Существует несколько методов в психотерапии алкогольной зависимости - это индивидуальный рациональный и семейная психотерапия. В первом случае это стандартное личное общение пациента с психотерапевтом, где основным вектором служит отказ от употребления алкоголя, внушение мысли о его вреде и обучение способам борьбы с патологическим влечением к алкоголю. В случае с семейной психотерапией, работа проводится с семьей пациента и направлена на уничтожение патологических стереотипов и преодоление созависимости партнера. Также существуют симптоматические методы, которые используют суггестивные стратегии. К ним относятся трансовые методики, гипноз и аутотренинг. В свою очередь в США, Израиле и Германии широко распространена программа «12 шагов». Работа проходит в

специальных анонимных группах. Исследователи неоднозначно относятся к этой программе, эффективность колеблется по разным данным от 5 % до 67%. Медикаментозное противорецидивное лечение, проводится опираясь на механизм возникновения зависимости, т.е. действием на нейротрансмиттеры, такие как допамин, серотонин, опиоидные пептиды, глутамат и ГАМК. В США одобрено 3 препарата: дисульфирам, налтрексон и акампрокат. Налмефен одобрен в Европе. [4]. Механизм действия дисульфирама заключается в ингибирующем влиянии на фермент алкоголь дегидрогеназу, в связи с чем повышается концентрация ацетальдегида в плазме крови. В двойном слепом рандомизированном плацебо-контролируемом исследовании эффективности и переносимости дисульфирама и цианамида под руководством Крупицкого Е.М. было выявлено, что нет различий в эффективности между дисульфирамом и плацебо, а переносимость дисульфирама хуже, чем у плацебо. [5]. В Казахстане нет рекомендаций по лечению алкогольной зависимости дисульфирамом, но этот препарат часто используется в частной практике у наркологов. Сочетание генетической предрасположенности с факторами окружающей среды повышает риск развития алкоголизма. Алкогольдегидрогеназа и АЛДГ существуют в нескольких формах, кодируемых разными генами, среди которых ADH1B и ALDH2. Например, аллель ADH1B * 3 вызывает более быстрый метаболизм алкоголя и тем самым люди с этим аллелем имеют более низкий риск развития алкоголизма. Эти данные указывают на возможность прямого изменения определенных генов (например, ADH1B и ALDH2) с помощью редактирования генов (например, CRISPR / Cas9) для лечения алкоголизма, вызванного генетическими дефектами. CRISPR/Cas9 - это новая технология редактирования геномов высших организмов, базирующаяся на иммунной системе бактерий.

Выводы:

1. При проведении сравнительного анализа подходов к лечению алкогольной зависимостью в мире и в Казахстане, мы выявили несколько значимых различий в подходах к лечению уже на 1 этапе оказания помощи. В США не используются БАДы для лечения алкоголизма, также в Америке по сравнению с Казахстаном больше частных центров для лечения зависимостей.

2. Мы проводили параллель между подходами к лечению в мире и в Казахстане, по нашему мнению, в мире гораздо больше уделяют внимание именно поддержанию ремиссии у пациентов с зависимостью и способствуют этому на всех этапах лечения, в Казахстане же, возможно из-за высокой стигматизации или низкого уровня жизни, в основном проводится лечение острых последствий лечения алкогольной зависимости. В то время как, очень небольшое количество пациентов с зависимостью желают переходить на 2 этап лечения и поддерживать ремиссию.

3. Существуют методы будущего для лечения алкоголизма и оно за генной терапией, т.к. алко-

гольная зависимость развивается не только под воздействием средовых факторов, но и генетической предрасположенности. Поэтому остается надежда на сохранение длительных ремиссий у пациентов с алкогольной зависимостью.

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THE PHYSICAL DEVELOPMENT OF RURAL AND URBAN PRIMARY SCHOOL STUDENTS IN ALTAI KRAI

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ФИЗИЧЕСКОЕ РАЗВИТИЕ СЕЛЬСКИХ И ГОРОДСКИХ ШКОЛЬНИКОВ МЛАДШЕГО ШКОЛЬНОГО ЗВЕНА В АЛТАЙСКОМ КРАЕ

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Abstract

The study assessed the physical development of rural and urban children aged 7-10 years in the Altai Territory for somatometric indicators (height, body weight, chest circumference). It has been established that somatometric indicators of physical development in rural children of primary school level are statistically significantly higher than similar indicators of urban children in boys and girls. The revealed differences in the physical development of rural and urban children show a different combination and a share of the influence of environmental factors on the schoolchildren's organism.

Аннотация

В исследовании проведена оценка физического развития сельских и городских детей 7-10 лет Алтайского края по соматометрическим показателям (рост, масса тела, окружности грудной клетки). Установлено, что соматометрические показатели физического развития у сельских детей младшего школьного звена статистически значимо выше аналогичных показателей городских детей как у мальчиков, так и у девочек. Выявленные различия в физическом развитии сельских и городских детей говорят о различном сочетании и доле влияния факторов окружающей среды на организм школьников.

Keywords: physical development, schoolchildren, somatometric indicators.

Ключевые слова: физическое развитие, школьники, соматометрические показатели.

Непрерывно увеличивается количество факторов окружающей среды, оказывающих свое влияние на здоровье человека. Место и условия проживания накладывают свой отпечаток на здоровье популяции в регионах, странах континентах [3]. Важным звеном, отражающим здоровье популяции и позволяющим прогнозировать ее дальнейшее развитие, является здоровье детского населения. В настоящее время зарубежные исследователи и ученые нашей страны говорят об отрицательной тенденции в состоянии здоровья подрастающего поколения [1, 4]. Снижается физическая активность, повышаются умственные нагрузки в процессе учебы, меняется характер питания, ухудшается экологическая обстановка в крупных городах [3, 4].

Физическое развитие является одним из ведущих критериев, позволяющих делать выводы о состоянии здоровья человека. Многие ученые говорят о наличии региональных особенностях физического развития [2]. В Алтайском крае высока доля сельского населения (47 %), исходя из чего, интересно узнать, имеются ли отличия в физическом развитии у сельских и городских детей.

Цель исследования – провести гигиеническую оценку физического развития сельских и городских школьников 7-10 лет в Алтайском крае.

Было сформировано две группы обследуемых детей 7-10 лет. Первая группа – дети, обучающиеся и проживающие в г. Барнаул ($n=462$), вторая группа – дети, проживающие и обучающиеся в сельской местности Алтайского края ($n=382$). В группы обследуемых были включены только дети I и II группы здоровья. Обязательный критерий включения в группу – непрерывное проживание в городе (для городских) либо в селе (для сельских) не менее 5 лет. Предварительно от родителей было получено информированное добровольное согласие на участие ребенка в исследовании.

Результаты исследования. Показатель длины тела у мальчиков из сельской местности статистически значимо превышал таковой у мальчиков, проживающих и обучающихся в городе, причем эта тенденция выявлялась в каждом из возрастов исследуемого периода: в 7 лет $122,1 \pm 0,73$ и $128,2 \pm 0,92$ ($p < 0,001$); в 8 лет $126,3 \pm 1,02$ и $131,9 \pm 1,03$ ($p < 0,001$);

в 9 лет $128,4 \pm 0,95$ и $135,3 \pm 1,13$ ($p < 0,001$); в 10 лет $133,2 \pm 0,98$ и $141,8 \pm 1,34$ ($p < 0,001$), соответственно. Показатель роста у девочек города и села достоверно не различался только в возрасте семи лет, далее были выявлены статистически значимые различия.

Показатели массы тела городских и сельских мальчиков статистически значимо не различались в возрасте семи лет, с 8 до 10 лет включительно выявлено статистически значимое различие показателей, где масса сельских детей превышает данный показатель у городских детей. У девочек выявлена похожая тенденция нарастания значимости различий с возрастом. В возрасте семи и восьми лет статистически значимых различий между показателями выявлено не было: $18,8 \pm 0,92$ и $19,5 \pm 0,87$ ($p=0,32$); $22,5 \pm 1,01$ и $23,1 \pm 0,82$ ($p=0,29$), соответственно. В возрасте девяти и десяти лет масса тела у девочек, проживающих и обучающихся в селе, была статистически значимо выше, чем у девочек из города.

Окружность грудной клетки в исследуемых группах обоих полов в каждом возрасте от 7 до 10 лет была статистически значимо выше у школьников из сельских районов Алтайского края. Так, показатель окружности грудной клетки у городских и сельских мальчиков Алтайского края в возрасте 7 лет составил $57,83 \pm 0,92$ и $61,25 \pm 0,95$ ($< 0,001$), соответственно; в возрасте 8 лет – $59,2 \pm 0,78$ и $64,1 \pm 0,98$ ($< 0,001$); в возрасте 9 лет – $61,8 \pm 1,01$ и $66,7 \pm 0,87$ ($< 0,001$); в возрасте 10 лет – $63,2 \pm 0,75$ и $69,2 \pm 1,06$ ($< 0,001$). У девочек из города в возрасте 7 лет показатель составил $56,3 \pm 0,9$ у их сверстниц из сельской местности – $59,6 \pm 0,83$ ($< 0,001$); в возрасте 8 лет – $58,4 \pm 0,68$ и $61,9 \pm 0,81$ ($< 0,001$), соответственно; в возрасте 9 лет – $59,2 \pm 1,02$ и $63,2 \pm 1,04$ ($< 0,001$); в возрасте 10 лет – $61,9 \pm 0,92$ и $65,1 \pm 1,08$ ($< 0,001$).

Согласно стандарту физического развития по региону мальчики сельской местности в возрасте 7 лет имели физическое развитие выше среднего, дисгармоничное, а мальчики 9 лет в городе – ниже среднего, дисгармоничное. У девочек в городе и сельской местности в возрасте 7 лет выявлено физическое развитие ниже среднего, гармоничное, в возрасте 8 лет – среднее, дисгармоничное (за счет

снижения массы тела). У городских девочек 9-10 лет физическое развитие ниже среднего, дисгармоничное.

Выводы.

1. Оценка антропометрических показателей у сельских детей и детей, проживающих и обучающихся в г. Барнаул, показала, что в возрасте 7-10 лет рост, масса тела, окружность грудной клетки, статистически значимо выше у сельских детей. Мальчики сельской местности в возрасте 7 лет имели физическое развитие выше среднего, дисгармоничное, а мальчики 9 лет в городе – ниже среднего, дисгармоничное. У девочек в городе и сельской местности в возрасте 7 лет выявлено физическое развитие ниже среднего, гармоничное, в возрасте 8 лет – среднее, дисгармоничное (за счет снижения массы тела). У городских девочек 9-10 лет физическое развитие ниже среднего, дисгармоничное.

2. Выявленные различия в физическом развитии сельских и городских детей говорят о различном сочетании и доле влияния факторов окружа-

ющей среды на организм школьников. У сельских детей наблюдается более гармоничное развитие антропометрических показателей, у городских детей выявляется несоответствие в интенсивности изменения показателей с возрастом.

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PEDAGOGICAL SCIENCES

DISTANCE LEARNING METHODOLOGY IN SCIENTIFIC AND PROFESSIONAL FIELDS OF COMMUNICATION (THROUGH THE EXAMPLE OF DEVELOPMENT OF MASTER DEGREE'S ONLINE COURSE ON THE METHOD OF ANALYSIS OF PEDAGOGICAL CASES)

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Abstract

In this article has been analyzed the usage of IT technologies in the distance learning mode in the scientific and professional fields of communication through the example of development of master degree's online course on the method of analysis of pedagogical cases. Purpose of this article is to reveal the appliance level and practical results of distance learning in scientific and professional fields of study and analyzing its features, possibilities and potential.

Keywords: IT technology, distance learning, pedagogical cases, methodology, master degree's project

The modern level of information technology development put forward the need to develop special methodological training. The purpose of this study is to investigate the distance learning methodology in scientific and professional fields of communication on the example of development of master's online course on the analysis method taking into account the specifics of the course applying modern information technologies. The development and active use of information technologies in education had a start at the beginning of the 21st century, and this process of development of information technologies worldwide requires some replenishments in educational methods and methodology. The process of developing information technology means defining an equally significant process - the web development of society and the web development of education. Such as one of the main goals of modern education becomes the development of students' abilities for self-education and creative use of the gained knowledge, it is necessary to find educational tools that could contribute to the acquisition of new knowledge themselves. According to A.L. Nazarenko, "when we talk about integrating information technologies into the learning process, this is primarily associated with distance learning. Before this innovation, there were computer educational programs, which, of course, still exist and function properly. But distance learning is "providing education" to students by changing the vector of movement in education from the one point to everyone; Considering that the field of education did not have such an unprecedented interactivity, it was an impressive new object in the process of education. Distance learning has found its application where there are no another competitors"[1]. Recently, the question of actualization of the cognitive activity of students has been of particular interest. This is due to the fact that in the context of the development of information technology, qualitative changes are taking place in the organization of students' educational activities. Priority in teaching

is given to the design and development of a new, expanded, rich information and communication technology and a multifaceted educational environment [2]. A significant part of this environment is a virtual educational environment that develops and functions based on computer technology. The technical basis of this environment is computer networks with a well-developed infrastructure and social services, within which subjects of educational activity are given the opportunity to "always be in class," regardless of the current time and location. Information and educational environment implies as the main the following interrelated components: educational resources, educational communication and management of educational interaction [3, p. 150]. In accordance with this approach, the problem of creating remote support tools in the learning process is being deeply investigated.

Information technology is rapidly developing and penetrating almost all areas of professional activities. Educational activity is no exception, but on the contrary is susceptible to the use of new technologies for organizing the educational process and educational activities of students. E-learning designed to expand access to educational services and high quality of educational materials both on national and international level. "The educational paradigm is changing from the traditional learning model to e-learning and further to Smart-education. Respectively, the role of universities is changing – from a provider of knowledge to creating conditions for students to acquire new knowledge on their own. Thus, the teacher becomes not a provider of ready-made knowledge, but acts as a navigator through the endless information and knowledge space. Smart-education programs allow students independently acquire the knowledge he needs, using the potential information society and intelligent technologies"[4]. (With the development of information technologies, new forms of implementation of educational programs became possible: blended learning [5], the construction of individual trajectories for students [6]. New types of

educational activities have arisen due to the widespread adoption of ICT and the Internet in society, such as webinars, virtual reality, online seminars, gamification, mobile learning, smart course and others. Under the influence of ICT, they change communications in the academic environment; less often students visit libraries and more often use social media [3]. The ICT usage in education measured over decades and in itself is not an innovation for the educational process, however, it opens up wide opportunities for the innovative development of individual courses as part of the creation of a network master's degree in professional field. The use of ICT for the development of individual courses is out to a new level. Each teacher, researcher and student gets free access to a wide range of information technologies and sources, including new social media, video conferencing services, e-course constructors, massive open online courses, and open educational resources. The variety of available means and forms of e-learning allows to realize the innovative potential of teachers and students in the development of e-courses and individual online components. Thus, each developed electronic course is an innovative embodiment of the results of the methodological and research work of teachers and students.

In the process of development the distance master's degree course using pedagogical case analysis method in professional-scientific community it is supposed to include:

- mobile technologies that enable the implementation of new models of communication and collaborative work not tied to bulky computers. Mobile learning means easy access to educational materials, testing and participating in communities;
- cloud technologies allow both teachers and students do not overload memory their devices by installing and storing educational online components, and on the other hand have access to educational space from any device anytime;
- social media, as a rule, include web 2.0 services, which allow to establish interaction of students with the professional community within the framework of educational process, expand the educational information space to the scale of the industry.

Methodology and methodological novelty of the project is defined by the integration into the educational process (distributed over time and space) static and dynamic course elements. The novelty of the project is due to the implementation of an individual approach to mastering the system of pedagogical professional-scientific knowledge: in accordance with the structure of the course, the student (teacher) chooses at his own discretion the range of issues that seems to him optimal and aimed at

- a) mastering elementary knowledge of the discipline;
- b) the formation of basic knowledge by discipline;
- c) formation of a broad professional and scientific worldview.

The methodological novelty of the project is the partnership activities of teachers and undergraduates of two universities in the form of projects, forums, online

discussions, webinars, blogs, scientific consultations and joint publications. The developed distance course is focused on the discipline of Professional and Scientific Education, included in the basic part of the professional cycle of disciplines. It forms the foundational methodological competencies of undergraduates necessary for the development of other professionally oriented disciplines in scientific direction. The distance course being developed includes two elements: static and dynamic. Static element presented by lecture notes, video lectures, workshops, project assignments, reference materials, glossaries terms, links to open educational resources, relevant thematic publications in the press, interactive tests and other assessment means. The dynamic element includes a working electronic exercise book with tasks for training and self-test, forums, chats, wiki pages. Course content focused on lighting 14 sections:

1. General science as an interdisciplinary area of humanitarian knowledge and its place in the system of scientific knowledge about man.
2. The modern structure of knowledge about the science. Science definition and its essence. System and structure in professional science.
3. History of science in pedagogical teachings. The origin of pedagogical scientific traditions.
4. Science and thinking.
5. Science and society. Sociology.
6. The problem of science universal
7. Basic methods in science
8. Science in the modern world
9. Language and culture
10. Basic study methods in science.

The specified topic is designed to solve the following tasks of studying the discipline: acquaintance with basic theoretical approaches to general science; acquaintance with the history of sciences; the formation of ideas about the main stages of the development of pedagogical science; understanding the main scientific schools; acquisition of knowledge about specifics studied sciences, their systems values and norms that determine the rules of this field; development of ability to analyze and adequately interpret scientific norms in pedagogical approach in specific conditions of interaction.

As a result of studying this course students should have the following competencies:

- possession of the heritage of scientific thought aimed at solving general humanitarian and universal problems;
- possession of the culture of thinking, the ability to analyze, generalize information, staging goals and the choice of ways to achieve them, owns the culture of oral and written speech;
- possession of a system of linguistic knowledge, including knowledge of basic phonetic, lexical, grammatical, word-formation phenomena and patterns of functioning of the studied foreign language, its functional varieties;
- possession of modern methods of collecting, storing and presenting databases and knowledge in intelligent systems for various purposes, taking into account the achievements of corpus linguistics;

- possession of modern scientific paradigm, a systematic view of the dynamics of development of the chosen areas of scientific and professional activity;
- educational environment;
- the ability to use the conceptual apparatus of philosophy, theoretical and applied linguistics, translation studies, lingo-didactics and the theory of intercultural communication for solving professional problems;
- the ability to apply modern technologies for collecting, processing and interpretation of the obtained experimental data;
- the ability to form scientific picture;
- ability on your own acquire and use in research and practice activities, new knowledge and skills, to expand and deepen their own scientific competence;
- the ability to independently master innovative areas and new research methods;
- the ability to use in cognitive and research activities, knowledge of the theoretical foundations and practical methods of solving professional tasks;
- ability on your own develop an urgent problem that has a theoretical and practical significance;
- readiness for postgraduate studies in selected and related training profiles.

Analysis of foreign experience in the use of distance learning technologies in master's educational programs revealed that most leading foreign universities use elements of online learning, the so-called "blended learning". Application of a certain set of information technologies for many universities in the world has become the standard for training events. List of information technologies, which have become traditional tools in the educational process, are now significantly expanding due to new social media (social networks) and web 2.0 services. The number of embedded educational innovations in universities, such as massive open online courses (MOOCs), gamification (serious games), the creation of professional knowledge networks. Differences in the use of distance learning technologies by foreign universities from Russian ones lie in the fact that these technologies are more often used precisely in the implementation of master's educational programs, including completely in online format. Opportunities for online study for a master's program with the subsequent award of a diploma are provided by: Harvard University, University of California (University of California - Los Angeles), Imperial College London, Columbia University, New York University, Pennsylvania State University. Universities leading the ranking of the best universities in the world, prove that online learning can and should be of high quality. Requirements for applicants for educational programs online identical to the requirements for applicants choosing to study on a university campus.

In conclusion, it should be noted that scientific and methodological significance this project consists in the development of application methods distance learning technologies in the organization of interactive, project and practical students' activities in the studied scientific disciplines in pedagogical direction. Development of interactive the basics of building a course (the interac-

tion of all its elements and online components) is provided system of end-to-end hyperlinks in the structure of the course itself: lecture material → basic (key) concepts of the course sections → tests → practical tasks → problematic tasks and projects.

This design approach content of the distance course master's degree allows you to achieve the set learning objectives and to ensure the activation of the cognitive activity of students with effective use didactic possibilities of the electronic educational environment. As a result of our research, there have been:

- 1) describe the methodology and technique of using distance technologies for organization of project activities for master degree;
- 2) an algorithm for constructing distance course in master degree;
- 3) shown the role of information technology in modernization and formation new model of universities;
- 4) an algorithm for the functioning of the future network model of teaching in professional science in a distance format has been developed.

As the experience of university education shows, modern computer and telecommunications technology along with the formation of market relations in education have formed new models of the university. "These are such institutional forms as distance education units in traditional and open universities, consortia of universities, television universities, virtual classrooms, virtual universities" [7]. Such a learning model in the scientific and professional field is one of the priority because it meets modern transmission technologies, processing, presentation, assimilation of educational information, takes into account the interests trainees and educators, well

built into the control circuit educational process of modern university.

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PHILOLOGICAL SCIENCES

ABOUT SOME REALIZATION OF THE EVALUATION OF MASLENITSA IN REGIONAL TEXTS OF CALENDAR POETRY ON THE TERRITORY OF THE BELGOROD REGION

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О НЕКОТОРОЙ РЕАЛИЗАЦИИ ОЦЕНОЧНОСТИ МАСЛЕНИЦЫ В РЕГИОНАЛЬНЫХ ТЕКСТАХ КАЛЕНДАРНОЙ ПОЭЗИИ НА ТЕРРИТОРИИ БЕЛГОРОДСКОЙ ОБЛАСТИ

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Abstract

The article is devoted to some implementation of the evaluation perspective of the beloved holiday in Russia "Maslenitsa" in the regional texts of calendar poetry in the Belgorod region. The author of the study presents several features of the oral poetic genre of East Slavic folklore, such as moderation in food, simple clothing, ideas about nature and the animal world, mythological plots, legends, conspiracies, spells. The article provides examples of both a positive attitude to Maslenitsa and a negative one. The villages and districts from which the texts of calendar poetry were taken are named. The author emphasizes that the picture of the world is materialized and expresses the content of the calendar cycle, and is based on such ritual texts as Shrovetide songs.

Аннотация

Статья посвящена некоторой реализации оценочного ракурса всеми любимого праздника в России «Масленица» в региональных текстах календарной поэзии на территории Белгородской области. Автор исследования представляет несколько черт устнопозитического жанра восточнославянского фольклора, таких как умеренность в еде, простая одежда, представления о природе и животном мире, мифологические сюжеты, сказания, заговоры, заклинания. В статье приводятся примеры как положительного отношения к масленице, так и отрицательного. Названы сёла и районы, откуда брались тексты календарной поэзии. Автор делает акцент на том, что картина мира как бы материализуется и выражает содержание календарного цикла, и основывается на таких обрядовых текстах, как масленичные песни.

Keywords: rite, song, Maslenitsa, poetry, folklore, assessment, genre, mythological plot

Ключевые слова: обряд, песня, масленица, поэзия, фольклор, оценка, жанр, мифологический сюжет

Устнопозитические жанры, бытующие на территории Белгородчины, обладают всеми чертами восточнославянского фольклора. Так, например, отличительной чертой будничной жизни была обыденность домашнего существования, умеренность в еде, простая, удобная одежда, спокойные и благожелательные отношения, замкнутость семейного мира. Будням всегда противопоставлялся праздник – время отдыха, веселья и радости. Рабочих дней было по количеству было намного больше. Чередование будней и праздников считалось необходимой составляющей нормального течения жизни, а сбои могли привести даже к гибели мира.

Следующей чертой восточнославянского фольклора занимают мифологические сюжеты, представления древних славян о природе, жизни и смерти. Отдельным обрядом были свадьба и похороны. Наиболее живучими чертами народного творчества были заговоры и заклинания. Существовали на Белгородчине предания, сказки, легенды. Очень нравились жителям Белгородской области

пословицы, поговорки, загадки, поучения, наставления.

Таким образом, фольклорные произведения нашего региона представляют оба вида русского народного творчества – обрядовую и необрядовую поэзию. Достаточно в полном наборе репертуар фольклорных жанров обрядовой и необрядовой поэзии, как отмечают собиратели народного творчества, распространен в селениях, расположенных по рекам Оскол, Псел, Северский Донец, Корень.

Особо отметим, что в настоящее время пока отсутствуют многоаспектные лингвофольклористические наблюдения над семантикой и функционированием устнопозитического обрядового и необрядового слова Белгородчины, поэтому частое изучение языка региональных фольклорных произведений будет весьма интересным и актуальным.

Как известно, что оценочная семантика фольклорного текста или слова, посредством которого

материализуется и выражается содержание календарного цикла, основывается таких обрядовых текстах, как масленичные песни.

Здесь нужно обратить внимание, что масленичные песни находятся в одном ряду с основными жанрами календарной поэзии, бытующих в нашем крае. К ним можно отнести зимние святочные жанры (колядки, щедровки, овсени, песни-гадания). И жанры зеленых святок (поэзия Троицы, девичьи песни, Семик, купальные песни и др.).

Тексты региональных масленичных песен, которые существуют на Белгородчине, частично опубликованы, некоторые пока существуют в рукописном виде, ряд текстов найден и зафиксирован в селах Богословка, Истобное (Губкинского района), в селе Крюково (Борисовского района).

Вторым календарным праздником после Нового года была Масленица, которую празднуют не только в Белгородской области, но и по всей России, в феврале или в начале марта. В славянской мифологии Масленица – это образ или персонаж, воплощающий плодородие и вместе с тем зиму и смерть. То есть она воплощает в себе биполярный концепт: с одной стороны – начала тепла и посадки земли, в другой – сожжение чучела, то есть смерть.

Название русского календарного праздника проводов зимы и встречи весны Масленица осмысливалась как имя антропоморфного персонажа, который встречали величальными песнями в начале праздника. «Широкая, веселая, честная масленица» – так называл её народ.

Типичные для времени масленицы обычаи пиршества, изобилие всяких яств, очень калорийных, всевозможные веселые развлечения и даже широкий разгул – все это символизировало то благополучие, которое должен был принести с собой будущий богатый урожай. Такой характер праздника масленицы нашел свое отражение в текстах белгородских масленичных песен, в их художественных образах, содержание которых раскрывается в лексическом строе. Особенность лексики масленичных песен состоит в том, что малая форма обуславливает очень строгий подбор тематической лексики. Но, несмотря на малый объем, по сравнению с другими жанрами, лексика масленичных песен очень богата по своему содержанию. Это говорит не только о традиционности в употреблении слов в песне, но и о том, что каждое слово в ней неслучайно. Еще В.Г. Белинский о весомости каждого слова в поэтическом смысле говорил, что «...в поэтическом произведении устраняется все случайное и постороннее, и представляется одно необходимое и знаменательное, совокupленное в стройной картине, носящей в себе оттенок единства и цельности» [Кравцов, 13].

Смысловое содержание номинаций масленицы обусловлено критерием антропоморфизма. Антропоморфные номинации присутствуют в текстах, информирующих о встрече масленицы, но также обнаруживаются в песнях, исполняемых во время гуляний.

В текстах календарного цикла, как и во многих других жанрах, ярко отражена такая черта фольклорного языка, как вариативность номинантов.

В масленичных текстах вариативность номинантов является и способом выражения оценочного отношения исполнителей к персонажу масленицы. В региональных текстах главное действующее лицо обозначается следующими ключевыми номинантами в своих вариантах: монолексемными номинантами: масленица, маслѣнка, маслена, и др.; бинарными номинантами: ...Масленица ...Широкая, Масленица-Просковья, Масленица-Чекотуха, Масленица-Полизуха. Обратим внимание на то, что онолексемные номинанты в оценочном плане или нейтральны, или отображают общий положительный фон, присутствующий в таком фрагменте текста, как встреча масленицы: «А мы Масленицу повстречали, сыром гору набивали ...» (с. Богословка Губкинский район). Наряду с подобным выражением положительного отношения, оценка со знаком «плюс» актуализируется и бинарными номинантами в текстах встречи масленицы: «Ой, да Масленица на двор въезжает!» (с. Истобное, Губкинский район). Пейоративное отношение к антропоморфному персонажу Масленица, как правило, обозначается посредством только бинарных номинантов, в которых после имени собственного «Масленица» присутствует оценочный компонент с отрицательным смыслом: «Ой, масленица-полизуха, Полизала весь сыр И масло понапрасну» (с. Новенькое, Ивнянский район). При этом отмечается присутствие отрицательных названий только в текстах проводов, общее содержание которых – это сожаление о кратковременности веселого праздника: «...Кабы семь недель (о масленичных днях), А посту неделька...».

Таким образом, оценочность в изученных жанровых текстах имеет свою специфику в реализации, характер которой определяется как общим содержанием текстов, так и семантикой ключевых фольклорных номинантов.

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POLITICAL SCIENCES

FROM NATIONAL IDENTITY TO NATIONAL CONSOLIDATION: THE IMPERATIVE OF NATIONAL INDEPENDENCE AND CITIZENSHIP

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ВІД НАЦІОНАЛЬНОЇ ІДЕНТИЧНОСТІ ДО НАЦІОНАЛЬНОЇ КОНСОЛІДАЦІЇ: ІМПЕРАТИВ НАЦІОНАЛЬНОЇ НЕЗАЛЕЖНОСТІ ТА ГРОМАДЯНСТВА

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Abstract

The results of the complex research into the dynamics of one of the most important imperatives of national identity on the way to the consolidation of the Ukrainian nation, such as national independence and attitude to the Ukrainian nationhood are presented, which determines the scientific urgency of this scientific elaboration. The main phases of the course are the bifurcation points that the Ukrainian nation had to pass through several times during the period of Ukraine's independence: the first bifurcation, 1991 (the recognition of independence of the Ukrainian state); the second bifurcation, 2004-2005 (the Orange Revolution); the third bifurcation, 2013-2014 (the Dignity Revolution); the fourth bifurcation, 2020 (impact of the world pandemic COVID-19 on national identity). The attitude of citizens to the state independence of Ukraine, which generates one of the most important imperatives of national identity, as well as the attitude of Ukrainians as a political nation to the phenomenon of citizenship in terms of external, internal, subjective and objective indicators has been analyzed.

Анотація

Представлені результати комплексного дослідження динаміки одного з важливих імперативів національної ідентичності на шляху до консолідації Української нації, таких як національна незалежність та ставлення до українського громадянства, що визначає наукову актуальність та певну унікальність даної наукової розробки. Основними фазами руху є точки біфуркації, які українській нації довелося проходити за часів незалежності України декілька разів: перша біфуркація 1991 року (визнання незалежності Української держави); друга біфуркація 2004 – 2005 рр. (Помаранчева революція), третя біфуркація 2013-2014 рр. (Революція Гідності), четверта біфуркація 2020 року (вплив світової пандемії COVID – 19 на національну ідентичність). Досліджено ставлення громадян до державної незалежності України, яке генерує один з важливих імперативів національної ідентичності, а також проаналізовано ставлення українців як політичної нації до феномену громадянства за зовнішніми, внутрішніми, суб'єктивними та об'єктивними показниками.

Keywords: National identity, imperative, bifurcation, citizenship and Consolidation of the Ukrainian Nation.

Ключові слова: національна ідентичність, імператив, біфуркація, громадянство та консолідації Української нації.

Повноцінна національна ідентичність є запорукою консолідації Української нації. Стаття присвячена аналізу деяких імперативів національної ідентичності, які фактично ведуть до процесу консолідації всієї нації. В соціогуманітарних науках найчастіше усталені поняття визначаються поглядами, точками зору та науковими підходами. Автором статті термін «імператив» розглядається відповідно до англійського аналогу «imperative» - «extremely important or urgent», як безумовний принцип людської поведінки[1].

Метою наукової статті є динаміка національної ідентичності шляхом аналізу імперативів у часи біфуркацій. Слово «біфуркація» походить від лати-

нського терміну, що позначає роздвоєність. Відповідно до того, як саме розвивається система – еволюційним шляхом, або з кардинальними якісними змінами, що підтверджують кількісні показники, - з'являються точки біфуркації з перебудовою самої системи або, якщо система змінюється безперервно, з'являються каскади біфуркацій, які змінюють один одного.

Подібні каскади біфуркацій генерують нову модель розвитку складної системи, у нашому випадку національної ідентичності, що можна порівняти з ситуацією, де можливий лише один з безлічі варіантів вибору. В наукових колах поширена гіпотеза, що громадяни України під час з кожної біфуркації обирали подальший шлях розвитку України,

відповідно, чи то національно-громадянська консолідація всього Українського народу, чи то фактична відмова від державності та незалежності. Кожну біфуркацію характеризують імперативи, які виникли у точці біфуркації національної ідентичності.

Важливим лакмусом трансформації процесів динаміки національної ідентичності в Україні є біфуркації, які українській нації довелося проходити за часів незалежності України декілька разів. Перша біфуркація відбулася 1991 року, визнанням незалежності Української держави. Друга біфуркація сталася у 2004 – 2005 роках у процесі Помаранчевої революції, а Революція Гідності у 2013 році започаткувала третю біфуркацію. Четверта біфуркація 2020 року виникла під впливом світової пандемії COVID – 19.

Отже, завданнями статті є, дослідити динаміку ставлення громадян до державної незалежності України, яка генерує один з важливих імперативів національної ідентичності, а також з'ясувати ставлення українців як політичної нації до феномену громадянства за зовнішніми, внутрішніми, суб'єктивними та об'єктивними показниками.

Так, за результатами Всеукраїнського референдуму 1 грудня 1991 року із запитанням в бюлетені: «Чи підтримуєте Ви Акт проголошення незалежності України?», 90,32% кількості громадян різних етнічних груп відповіли «Так, підтверджую», а 7,58% кількості громадян відповіли «Ні, не підтверджую» [2].

Асоціацією політичних психологів України та Інститутом соціальної та політичної психології НАПН України 8-15 вересня 2017 року було проведено дослідження «Громадська думка та електоральні наміри українців на початку нового політичного сезону». Відповідно до результатів дослідження, на запитання «Чи підтверджуєте Ви прийнятий у 1991 році Акт проголошення незалежності України?» у 2011 р., напередодні третьої біфуркації, 78,4% громадян України відповіли «так», у 2017 році – 93,1% [3]. Позитивна динаміка ставлення громадян до державної незалежності України зберігалася всі роки з 2011 до 2021 року включно. Однак, збільшення прихильників національної незалежності в Україні має свою регіональну унікальність: серед мешканців Західного макрорегіону найбільша частка прихильників незалежності припадає на 2015 рік, у 2016 році простежується зменшення частки тих, хто підтримує цей процес. У Центральному макрорегіоні найбільша частка прихильників незалежності припадає на 2014 рік, а з 2015 року відбувається поступове зменшення частки тих, хто підтримує Акт проголошення незалежності України. Східний макрорегіон зберігає позитивну динаміку ставлення до державної незалежності України з 2011 до 2016 року включно (з 80% до 93,1%), але станом на 2017 рік відбувається незначне зменшення до позначки 90,6%. Південний макрорегіон у 2017 році набрав найвищий відсоток прихильників державної незалежності за досліджуваній період та серед інших регіонів держави – 96,9%. Так, можна говорити про позитивну тенденцію збільшення частки тих, хто підтвердив би

прийнятий у 1991 році Акт проголошення незалежності України.

Вже за часів другої біфуркації 2004 – 2005 років частка тих, хто скоріше та дуже пишається, що є громадянином України становила 37,7%, відповідно, хто скоріше та зовсім не пишається – 24,7 % опитаних (2004 рік); частка тих, хто скоріше та дуже пишається, що є громадянином України у 2005 році становила на 16% більше, а тих хто скоріше та зовсім не пишається – на 9,8% менше з числа опитаних. За часів третьої біфуркації відбувається стрімке збільшення числа тих, хто пишається українським громадянством – 47,7% (2013 рік); 60,7% (2014 рік); 67,3% (2015 рік); 60,1% (2016 рік); 62,5% (2017 рік); але саме у часи четвертої біфуркації відбувається збільшення на 10 % та становить 72% опитаних (2021 рік) [4].

Важливо, що громадянами України у 2021 році визнали себе - 59% опитаних, у 2017 році - 57,2%, у 2016 році - 60,1 % респондентів, що перевищує показник 2013 року на 10 %. У 2017 році кількість прихильників локальної приналежності становить 24,7%, що на 2,6% перевищує показник 2016 року. У 2021 році ці показники значно знизилися, та становлять 19% - ідентифікують себе з населеним пунктом, 11% - відчувають себе мешканцями регіону [4].

Отже, позитивною тенденцією є те, що більшість респондентів за всіма регіонами України відчувають себе саме громадянами України. Це так звані суб'єктивні відчуття. Вони відіграють важливу роль у побудові цілісної системи національної ідентичності. Але не менш значущими є об'єктивні показники, такі як світові рейтинги громадянств світу та закордонних паспортів. Розглянемо лише деякі з них. Так, відповідно до Індексу громадянств світу за системою QNI [5] (The Henley & Partners – Koehenov Quality of Nationality Index), Україна піднялася з 105-го місця у 2016 році на 75-е місце у 2018 році, посівши місце серед країн з помітним зростанням цінності громадянства. У період з 2011 до 2018 років поступово збільшувався сумарний рейтинг відповідно до Індексу громадянств світу за системою QNI з 31,8% до 38,2%, що дозволило Україні перейти з країни з низьким індексом (Low Quality: Nationalities with a value of between 20.0% and 34.9%) до країн з середнім індексом громадянств світу (Medium Quality: Nationalities with a value of between 35.0% and 49.9%). Система QNI враховує внутрішні фактори (людський розвиток, економічне зростання та стабільність і безпеку) та зовнішні чинники (можливість без різних бар'єрів подорожувати світом, що передбачає свободу переміщення та свободу розселення).

Відповідно до Індексу закордонних паспортів [6], який ранжує країни щодо можливості відвідувати різні держави світу без візи, Український паспорт зайняв 37 місце в світі у липні 2021 року, у січні 2021 – 41 місце, у 2011 році - 63 місце.

Таким чином, імперативи громадянства та державної незалежності символізують започаткування системних змін, що призводять до зростання цінності українського громадянства в суб'єктивному та

об'єктивному просторі, а також є важливими чинниками у процесі консолідації Української нації. Ці процеси є частиною більш глибокого дослідження, але це тема для наступної наукової розвідки.

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LOCAL CONCEPTION OF CORRUPTION IN EKEH'S TWO PUBLICS AND ACHEBE'S MAN OF THE PEOPLE IN THE CONTEXT OF PLEA BARGAIN STRATEGY IN NIGERIA

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Abstract

Studies on corruption tend to view the phenomenon through a univocal lens. The problem that emerges is that the disparity that exists between official conceptions of corruption as codified in legal instruments and public policies and local conceptions of corruption often grounded in primordial ties and kinship networks are often eluded. More problems emerge as plea bargains permit public officials found guilty of corruption to only refund part of the monies entrusted in his/her cares. This situation cannot but raise serious challenges where people in a socio-cultural domain view public resources as good to be utilized to strengthen primordial expectations. This paper interfaces Ekeh's article on 'The Two Publics' in Africa and Achebe's tact portrayal of corruption in his novel 'A Man of the People' on Igbo society in the Plea Bargain as an anti-corruption policy in Nigeria. This paper, therefore, interrogates the efficacy of the plea bargain that negates the long historical analysis that shows a heroic celebration of corrupt officials at the primordial realm as a form of attack against the public realm perceived as a migrated social structure to be plundered. A community-centered paradigm is advocated as against institutional mechanisms for containing corruption in Nigeria.

Keywords: Local conception of corruption, anti-corruption agencies, public and primordial realm, plea bargain

1. Introduction

It has become a common buzzword to blame African woes on corruption; however, containing it remains elusive¹. Certain questions emerge about the circumstances responsible for corruption in Nigeria. Some opinions attempt to expound perspectives that portray pre-colonial Africa as an environment inhabited by 'saints', therefore, the 'birth' of the 'devil' called corruption is blamed on colonial interjection and overrule. The question that remains unattained is how corrupt practices as emergent social behavior become easily internalized and remained resilient. Portraying the saint-hood of the African past and holding a notion of its extension to post-colonial Africa is partly responsible for exonerating the primordial realm as a realm where corruption originates and is nurtured that infests the public realm. The notion in Ekeh² of generalized morality of the private and public realm in the West as contrasted with Africa with a dominant morality of the private realm and the amoral nature of the public realm calls for reexamination. The reexamination becomes imperative, as corruption has remained resilient in Africa despite its obvious destruction.

The destructive consequences of corruption in Africa call for great worry. Why is an issue that is morally wrong in the private realm also morally wrong in the public in Western society? Is it the Christian belief as Ekeh² shows or a moral imperative that is hinged on the enforceable laws? Why did Christian beliefs that enshrined moral behavior failed to accomplish the same in Africa under colonial rule? These questions need to be resolved. Ekeh² refutes the nexus between Christian belief as creating a basis of morality in the private and public realm in Europe citing Banfield's³ article that drew attention to corruption in the Southern Italian village. In this case, Ekeh² argues, "the total extension of

the Western conception of politics in terms of a monolithic public realm morally bound to the private realm can only be made at conceptual and theoretical peril". In this case, I argue that if there is the convergence in the amoral nature of human beings in both Western and African society in the absence of punitive and enforceable law it, therefore, highlights a clearer understanding of how Africa's weak institutions contribute to the festering and sustenance of corruption as contrasted from the Western society.

Achebe's⁴ "Man of the People" and Ayi Kwei Armah famous novel "The beautiful ones are not yet born" that also presented corruption quagmire in Ghana^[5] shows that weak institutions resulting from state fragility as I will argue later require a strong punitive and enforceable law contrary to plea bargain approach to fighting corruption in Nigeria. That Achebe's Man of the People' find local people operating in the primordial realm culpable in corruption quagmire raises a problem of setting a time frame of transformation from the dominance of morality in the pre-colonial Africa to the dominance of immorality of the post-colonial Africa based on Ekeh's² conceptual demarcation. However, Achebe, Ekeh, and Armah's articles converge on the destructive consequences of corruption and its strong impediment to collective development in Africa. My paper, therefore, contributes to the corpus of knowledge to an attempt to contain or eradicate corruption in Nigeria by interrogating the possibility of deploying a plea bargain as a strategy. This paper is written in five parts. The first is the introduction. The second part provides an overview of Nigerian society from the perspectives of Peter Ekeh² and Achebe⁴, the third part provides an overview of corruption in Nigeria. The fourth part examines the possibility of containing or

eradicating corruption using plea bargains and the fifth part concludes the discussion.

2. The perspectives of Peter Ekeh (1975) and Chinua Achebe (1966) on Nigeria society

The interface between Ekeh and Achebe's articles is in the underlying description of Nigeria's local society as a realm separate from national society, even though the former's intention was to highlight colonial rule and its implication for postcolonial African states and the latter's epic description of Nanga the corrupt politician and Odili the moralists (or idealist) who later had to recontextualize his stance on politics⁴. Ekeh's theorization of two public of which the private realm stands in contradiction with the public in terms of moral disposition leaves the implicit understanding that colonial intrusion into autochthonous local societies came with the introduction of the notion of corruption. The notion of corrupt-free pre-colonial Nigerian societies downplays the existence of disparity and exploitation between the ruled and rulers in which the former challenged the position of the latter resulting in the conflicts that occurred in communal, slave, and feudal societies.

If we accept that pre-colonial African leaders exploited the common people among them, we can also assume that Ekeh's work attempts to show that both the leaders and followers in the private realm concealed their differences (the haves and have-not). In that case, the migrated social structures as the police, legislature, bureaucracy, etc became the target of attack. It is hard to accept that there was a conspiracy by both haves and have-not against the colonial rule because the nationalists and their local supporters displayed privileged lives that aroused suspicion and conflicts in the localities. Even the contemporary societies are equally drawn to view the African past in the light of been highly moral. Viewed as such, the act of immorality common in Africa society is blamed on the inability of parents to bring up their children in an African traditional way⁶. This moral portrayal of the African past ignores some harmful practices that brought sorrow to some in the past such as the killing of twins in Igbo society, human sacrifice, harmful widow practice, victimization of orphans, slavery, and subjugation.

The right of Kings to impose their will on their subjects and "war of all against all" as depicted by Thomas Hobbes in his *Leviathan* is a universal theory, therefore should not be missing in Ekeh's conception of the African past. Besides, the Treaties of John Lock that followed the absolutism of Hobbes confirm that the disadvantaged in the earlier form of government viewed the system as corrupt, privileging, and excluding others⁷. Oral traditions, archaeological and early books by North African and Arab travelers contain information that shows inequality and servitude in pre-colonial Africa⁸. Ibos of Nigeria were described by Basden⁹ as occupying their time-fighting war among themselves, Abyssinia (Ethiopia), Rwanda, Swazi which is classified under absolute systems¹⁰, and the exploitation carried out by the Northern oligarchy against other members of the society were captured by Coleman¹¹, and Ochono¹².

Nevertheless, societies had institutions that guided against the concentration of power in an institution or a

person and averting the emergence of a rigid hierarchy¹³. It is difficult to identify pre-colonial Africa societies described by Ekeh², so guided by morality and where the absence of corruption was a ground norm or a given. I, therefore, argue that corruption as a social behavior predates the emergence of Nigeria as a state. Appropriation of what belongs to others or the entire community for personal use, existed with the human proclivity to assert hegemony over others. The nobles and the kings were differentiated from other people by the amount of wealth they possessed. Attempt to challenge this order resulted in an attack against the common people, since the nobles or kings in this pristine era represented the institution of governance and security.

The justification by Thomas Hobbes for the emergence of an absolute monarch to halt the state of nature provides the logic for the kings to assert inequality and rights to be respected by those who ordinarily would have been under precarious conditions. This interface between the ruler and the ruled is glossed over by Ekeh's² portrayal of moralistic society before the emergence of colonialism. His position I consider misleading. One notes the argument made by Ekeh² as thus:

When one moves across Western society to Africa, at least, one sees that the total extension of the Western conception of politics in terms of a monolithic public realm morally bound to the private realm can only be made at conceptual and theoretical peril. There is a private realm in Africa. But this private realm is differentially associated with the public realm in terms of morality. There are two public realms in postcolonial Africa, with different types of moral linkages to the private realm. At one level is the public realm in which primordial groupings, ties, and sentiments influence and determine the individual's public behavior. I shall call this the primordial public because it is closely identified with primordial groupings, sentiments, and activities, which nevertheless impinge on the public interest. The primordial public is moral and operates on the same moral imperatives as the private realm. On the other hand, there is a public realm that is historically associated with the colonial administration and which has become identified with popular politics in post-colonial Africa. It is based on civil structures: the military, the civil service, the police, etc. Its chief characteristic is that it has no moral linkages with the private realm. I shall call this the civic public. The civic public in Africa is amoral and lacks the generalized moral imperatives operative in the private realm and the primordial public.

Ekeh's position here is what I call 'moral partitioning'. His attempt to exonerate Africa's past from human proclivity towards misdeeds is misleading and problematic. At least, Harneit-sievers¹⁴ noted embezzlement and other forms of corruption in the local societies that reflect Ekeh's primordial realm. I argue, therefore, that a system of rule at the public realm targeting eradicating corruption in Africa and Nigeria, in particular, must be conscious of how it reinforces or exacerbates corruption at the primordial realm since it is not abhorred of corruption as Ekeh² argues. An individual can be amoral and operates in that manner within the primordial realm, but can find expressive action

against the public realm when seen as a scapegoat. The problem with Ekeh's theorization is seen against his assumption that the individual in Africa is amoral only in relationship or interaction with the public realm. Against this backdrop, it becomes imperative to juxtapose Ekeh's two public *vis-à-vis* Achebe's novel "A Man of the People".

Achebe's⁴ work titled 'A Man of the People' reflects a realistic view of African society. It provides a narrative of the machinations of African politicians to enlist the support of the common people to advance their quest for political power. The story centered on Chief Nanga and Odili Samalu, sees Nigerian society as a continuum in the reproduction of corrupt people seeking to incorporate those who claim to possess a more moral character than others do. Local people as Achebe highlights are aware that the politicians seek political power to enrich themselves, but wish to give their support because of expectations of certain favor from the politicians. The expectation of rewards for their support restrains the common people from the open condemnation of any conduct by the politicians. This point of convergence provides a confidence level to the politicians who are aware that their sustainability in politics requires keeping the line of patronage open. The work shows that opposition against the political office holders is motivated by personal rather than common ethical norms. Intention and awareness on the part of the local people (Ekeh's primordial realm) show an interlocking behavior that cannot be differentiated based on location.

Chief Nanga slapped Odili (the supposed moralist) when he seized the microphone to tell the crowd that Chief Nanga is corrupt and a liar. He was aware that he will get the full support of the crowd. People came out in mass to welcome Chief Nanga including their local Chiefs when he came to a party rally in his hometown to canvass for votes. His people are aware of government corruption and accept it as a way of life. As Chief Nanga speaks, Odili demanded the microphone and he offered him. As Achebe captures it:

I come to tell you, people, that he is a liar and As he speaks, Nanga slaps him on the face. To Odili's shock, the crowd joins in the beating: He pulled the microphone away smartly, set it down, walked up to me, and slapped my face ... immediately hands seized my arms, but I am happy that he got one fairly good kick from me. He slapped me again and again. Edna rushed forward crying and tried to get between us but he pushed her. By this time, blows were falling as fast as rain on my head and body until something heavier than the rest seemed to split my skull. The last thing I remembered was seeing all the police officers turn round and walk quietly away.

Chief Nanga responded later in the listening ears of his people as thus:

What a fool. Whose son is he? Was he not here when the white men were eating? What did he do about it? Where was he when Chief Nanga fought and drove the white men away? Why envy now that the warrior is eating the rewards of his courage? If he were Chief Nanga would he not do much worse? (pp 155-156)

The fight by Chief Nanga, (just as the nationalists against colonial rule) was largely for personal rather than altruist reasons. This concealment extends to the formation of opposition parties that accuse incumbent parties of corruption. The formation of the Common People's Convention (CPC) party by Max and Odili to challenge the P.O.P party belonging to Chief Nanga was purely an elitist power struggle than determination to eradicate corruption as canvassed by CPC members. An example was that Odili (the moralist) did not resign from the CPC party having realized that his party has a support of a junior minister in the corrupt government of P.O.P rather concluded that political ideologies must consistently struggle even without coherent codes of conduct to survive⁴.

When common people support political leaders of this nature, they do so for the same reason because corruption is a common behavior among them. The puzzle is whether plea bargain as a policy can be effective to eradicate corruption in a society where there is a convergence of corruption between the primordial and public realm. Therefore, the great concern lies in finding out answers to how plea bargain (which takes back part of what is stolen by a corrupt government official and allows him/her to return home without saving a prison term that commensurate matches the offense committed) can contribute to the eradication of corruption in Nigerian society. I will return to this argument later. The next section presents an overview of corruption in Nigeria.

3. Overview of corruption in Nigeria

While the concept of corruption encompasses so many things, the focus of this paper is as it relates to illegal means of appropriating public wealth for personal gains. Several reasons can be adduced for the prevalence of corruption in Nigeria but principally weak institutions emanating from state fragility are largely responsible. Weak institutions extend to hamper technological devices manufactured and deployed to identify corrupt persons in public offices as against appeal to moral reengineering. The police, army, and officers of the EFCC display such moral rectitude that confirms the sordid institutional mechanism for fighting corruption in Nigeria. Failure to deliver on economic and social security amplified a focus on recontextualization of the post-colonial African state's ability to contain its various challenges. It mostly raised questions about the aftermath of the nationalists' struggles for independence¹⁵. Most African states are susceptible to conflicts¹⁶, suffer legitimacy crisis¹⁷, fail to provide security regarded as the most important political goods¹⁸, and lacking "stateness"¹⁹, that is, enforcement, the ultimate ability to send someone with a uniform and a gun to force people to comply with the state's law. A state that is unable to enforce its will especially in areas that demand moral rectitude according to Myrdal²⁰, is soft. It, therefore, implies that a state must have an extensive and often highly punitive criminal and civil justice system that deploys substantial enforcement powers. Using corruption as a type of criminality to measure state failure is highly problematic but confirmable in Nigeria.

Corruption as a security problem raises the issues conversed by scholars on securitization²¹. Securitization teaches that the ruling elites can consider issues originally taken for granted or treated with kid gloves as security challenges, observing the phenomenon even from speech act, thereby broadening security agenda from state centeredness of security studies to include economic welfare, environmental concerns, cultural identities, political rights, individual and group security. The power elites then have the prerogative to label any issue as a security problem. They determine when, how, and why, and when a particular security threat is under control. In seeking to securitize the society, the elites are not bound to follow established rules or procedures as the survival of the threatened individual is uppermost²¹.

Equally important is that waging war against corruption in Nigeria receives support from United Nations Office on Drugs and Crime Country Office Nigeria²², under the 10th European Development Fund¹. The projects' outputs and achievements include the development of the Bibliography of Corruption in Nigeria; the Extradition Act (Modification) Order 2014 and Federal High Court (Extradition Proceedings) Rules 2015; the Federal Capital Territory Courts (Sentencing Guidelines) Practice Direction 2016; the Federal High Court (Corruption and Other Related Offences) Sentencing Guidelines and Practice Direction 2015; and the Code of Conduct Tribunal Ethics Guideline for Tribunal Staff. All the collaboration, including internal policies, has not resulted in eradicating corruption and how to deal with it remains elusive. Critiques and members of civil societies, who find themselves in government positions, easily become enmeshed in the looting of public funds for personal gains.

Nwolise²³ had argued that the anti-corruption policy in Nigeria should be mainstreamed into a lexicon of strategy. The author assumes that since extant policies on corruption are not able to arrest the trend or ameliorate its devastating consequences, "the war must be well planned, multi-dimensionally pursued, well-coordinated, and with the peoples' participation"²³. The work outlined four phases that can be followed to deal with corruption as thus: Phase one: preparation. Phase two: launching. Phase three: consolidation (enforcement and real war), and Phase four: sustenance (internationalization of anti-corruption to become a way of life in Nigeria). Broad acts that constitute corruption was highlighted in phase one stipulating red lines on stealing (referred as corruption) of public fund.

He argues in phase one that "in addition to returning stolen money, anybody who steals below ₦1,000,000. (One million naira) should go for community service (culture of shame) in the marketplace, a school, or government secretariat. Whoever steals between ₦1,000,000 and ₦5,000,000, should go for 10 years jail with hard labor. Whoever steals between ₦6,000,000 and ₦10,000,000 should face the death penalty. He posits that some people do not want to hear of the death penalty, but those who loot our commonwealth kill thousands of innocent citizens daily. In

phase two he argues that the launching of anti-corruption should be elaborate to include dethroning of money and enthronement of knowledge, patriotism, integrity, honesty, humility, good name, hard work, etc. In phase three he posits that anybody who crosses the "red line" must be arrested, prosecuted, and punished according to law no matter who is involved, arguing that if law enforcement agents begin to exclude sacred cows, horses, and elephants, then the war will be lost. Anybody who crosses the "red line" should be published in the newspapers and the internet with their pictures. Also, in phase four he posits that for internalization of anti-corruption ideas, values, and practices, people should learn the culture of keeping their hands away from public funds, and of questioning opulence and sources of people's wealth, instead of hailing thieves. Since corruption in Nigeria has made a dangerous dive he argues, it must be given a dangerous bullet. Though the author appeared to have anchored his confidence on the implementation of his postulations on President Buhari as a retired military officer, yet the work certifies the criteria of social science research, therefore the policy prescription can be deployed by other regimes whether engineered by a civilian president who does not have a military background or not.

Contemporary discussion on corruption is largely limited to attempts by the Economic and Financial Crime Commission (EFCC), Code of Conduct Bureau, and Independent Corrupt Practices Commission (ICPC) to contain corrupt practices in Nigeria²⁴. These robust institutional mechanisms to fight corruption became a hallmark of the Fourth Republic differentiated from the previous attempt under military regimes. This is not new. Anti-corruption crusades emerged as far back as 1950 as a response against the prevailing state of corruption in some institutions²⁵. The work shows that the League of Bribe Scorners founded by some students of Kings College in Lagos and the Anti-Bribery and Corruption Society of Nigeria in the 1950s emerged as a response against government institutions and society bedeviled by corruption. The report by the Federal Republic of Nigeria^{26, 27}, cited in Enweremdu²⁴ showed that there was an official inquiry established to investigate corrupt practices in the Eastern region government under the National Congress for Nigerian Citizens (NCNC). In 1962, a commission of inquiry known as Justice Coker Commission showed how politicians in the Western region under Action Group (AG) used the marketing boards then to divert millions of pounds for their party and personal use²⁸ cited in Enweremdu²⁴. It is well documented that the use of federal resources to enrich ethnic loyalties, mismanagement and party supporters elsewhere by the political office holders in the first republic accounted for the first military coup against the Nigerian state^{29, 30, 31, 32}.

Therefore, containing corruption requires a more nuanced approach than the plea bargain offered by policymakers. To introduce a plea bargain in a society where there are amoral problems and opulence is construed as a sign of approval and institutionalization of corruption. The next section, therefore, interrogates the

¹ The project supports the promotion of good governance, transparency, accountability, and anti-corruption policy in Nigeria. The implementation of this project is in three phases: (i) strengthening anti-corruption policy-making, coordina-

tion, monitoring, legislation, and research in Nigeria; (ii) assisting the Nigerian government in strengthening relevant institutions, and (iii) facilitating the empowerment of civil society in the area of anti-corruption.

tenability of the success of plea bargain as an anti-corruption policy in Nigeria.

4. The possibility of containing or eradicating corruption using a plea bargain approach

There is controversy over which type of crime could be more appropriate if a plea bargain method can be used as an approach to contain it. The plea bargain originated in the USA³³ where it is mainly used to deal with criminal cases as theft, abuse, injury, and other crimes not associated with looting public funds but in Nigeria used mainly in the trial of public officials facing charges of looting public funds. One question it raises is how to measure the impact of corruption and consequences if plea bargain serves the same purpose of punishing the offender to deter future occurrence. How local society views plea bargain becomes imperative unless taken as given that they are moral and will remain uninfluenced even when the national strata of the society are grossly enmeshed in corruption. No doubt Ekeh's attribution of innocence to the primordial realm could influence policymakers to ignore the effect of non-deterrence content of the plea bargain. As Achebe's *Man of the People* shows not even the moralist in the primordial realm can sustain the disposition of morality over a while before caving into the corrupt influence of the majority in the locality.

Adetomiwa³⁴ shows that EFCC introduced the concept of plea bargain through the Economic and Financial Crimes Commission Act 2004 (EFCC Act). Section 14(2) of the Act provides as follows: *"subject to the provisions of section 174 of the Constitution of the Federal Republic of Nigeria, 1999 (which relates to the power of the Attorney-General to institute, continue, takeover or discontinue any criminal proceedings against any person in any court of law), the Commission may compound any offense punishable under this Act by accepting such sums of money as it thinks fit, exceeding the amount to which that person would have been liable if he had been convicted of that offense."* However, a plea bargain was introduced into the Nigerian criminal justice system by Lagos State under what is referred to as the Administration of Criminal Justice Law (ACJL 2007) of Lagos State. According to Adetomiwa³⁴, it was possible since under the Nigerian legislative framework it is not the exclusive preserve of the center to enact laws to regulate the criminal justice system.

Plea bargain has been used to try three categories of financial crimes in Nigeria. The trial of some cases relating to advanced fee fraud like the 2004 celebrated case of *FRN v. Nwude and others* alongside their four companies arraigned before an Abuja High Court for swindling a Brazilian bank, Banko Noroeste S.A., Sao Paulo, Brazil the sum of \$242 Million in which case one of the accused persons Amaka Anajemba changed her plea to a guilty plea in the middle of the trial. In the case, Amaka Anajemba got a two and half year imprisonment and the other two persons got 25 and 12 years and were made a refund of 110 million dollars to the Brazilian bank and 11.5 Million Dollars to the Federal Government including forfeiture of their houses and vehicles³⁵. The second case is the one involving Mrs. Cecilia Ibru. In October 2010, the Economic and Financial Crimes Commission (EFCC) charged the former Chief Executive Officer of Oceanic Bank International

Nigeria PLC, Mrs. Cecilia Ibru with twenty-five count charges on financial crimes. She entered into a plea bargain with the prosecution and pleaded guilty to a lesser three-count charge. The Court thereafter convicted her on the three-count charge and ordered the forfeiture of her assets amounting to about N191Billion. She was sentenced to six months on each of the three counts which ran concurrently. In effect, Mrs. Ibru only spent six months in jail³⁵. This case of Mrs. Cecilia Ibru cannot be taken for public funds because ordinary people are the shareholders and government is the regulatory agency.

Public funds are only associated with government officials or employees of the government. My worry is on why plea bargain is used to try government officials who steal public funds and the implication on society. Sources of public funds as Niven³⁶ posit is "all government revenue. That is to say, it is the money of the people of Nigeria. It comes from their taxes, from the Customs duties they pay, from the fees which are charged for various actions of Government Departments, from rents on lands and mining leases, from the stamps and postal orders they buy and so on," and I will add money from foreign loan and aid. The trial of former Inspector-General of Police Mr. Tafa Balogun in 2005 is a clear use of a plea bargain against a public official. In the trial, Mr. Tafa Balogun pleaded guilty to an amended eight-count charge of corruption and embezzlement of public funds to the tune of 10 billion nairas. He gave up most of the funds and got just six months for the offense which attracts a maximum of five-year jail terms. The issue applies to former Governor Alamiyeseigha of Bayelsa State. He was sentenced to 12 years in prison on a six-count charge that on corruption and other economic offenses in 2007. Under a plea bargain, he was sentenced to two years on each count but all sentences ran concurrently, starting from the day he was arrested and detained and therefore released on the day he was sentenced.

In 2008, the former governor of Edo State from 1999 – 2007, Chief Lucky Nosakhare Igbinedion was arraigned by the Economic and Financial Crimes Commission (EFCC) before the Federal High Court, Enugu on a 191- count charge of corruption, money laundering, and embezzlement of N2.9b. In a plea bargain arrangement, the EFCC through its counsel Mr. Rotimi Jacob reduced the 191- count charge to a one-count charge. In that case, Lucky Igbinedion refunded N500m, three properties, and pleaded guilty to the one-count charge³⁷. The Deputy Director, Police Pensions Office John Yakubu Yusufu, got a reduced term and fine having pleaded guilty to charges against him. He was arraigned before a Federal Capital Territory (FCT) Abuja, High Court on a 20-count charge for converting N32.8billion Police pension funds to his use. However, on 28 January 2015 Justice Abubakar Talba sentenced him to two years imprisonment on each of the counts with the option to pay a fine of N250, 000.00 for each count. Besides, the convict was ordered to forfeit 32 landed properties and the sum of N325.187 million to the Federal Government. This was because the convict saved the time of the court by pleading guilty³⁸.

One major problem with a plea bargain in Nigeria is the lack of social relevance. It is not connected to society since its deterrence effect is missing. Ani³⁵ argues

plea bargain provides immunity against corruption because the corrupt officials know that he/she will only refund a part of what was stolen from the public treasury with a reduced jail term if any when caught. I argue that a plea bargain can even turn the moral public into amoral public since the culprit is as good as a free person when caught in corrupt acts. A plea bargain is certainly a misnomer in a society condemned by corruption. Achebe's portrayal of African society as corrupt warrants that any targeting elimination of corruption must ensure strong punitive measures. More worrisome is that plea bargain undermines the consequences of looting public funds. It seriously ignores that failed roads, inadequate provision of security, insufficient medical care, insufficient electricity supply hunger, and crime including dependence on developed countries and loss of lives are connected to brazen looting of public funds that would have been used to contain the problems. As argued by Rawls³⁹ under retributive law, punishment is justified because people deserve it. The argument is made as thus:

What we may call the retributive view is that punishment is justified because wrongdoing merits punishment. It is morally fitting that a person who does wrong should suffer in proportion to his wrongdoing. That a criminal should be punished follows from his guilt, and the severity of the appropriate punishment depends on the depravity of his act. The state of affairs where a wrongdoer suffers punishment is morally better than the state of affairs where he does not, and it is better irrespective of any of the consequences of punishing him.

Plea bargain I argue is another form of legitimizing corruption, since contrary to Ekeh's portrayal of the primordial realm as moralistic, African society has always been corrupt and remains corrupt till today. A society that is enmeshed in corruption would easily see plea bargain as the mere justification of the already held practice. Anti-corruption wars have failed because the framers failed to interrogate its societal relevance. Ekeh's two public and Achebe's man of people on local society in Nigeria is a clear indication that for any anti-corruption policy to be effective the society must be part of the process. The pretense that refunding part of the looted public funds and returning home (joining your kiths and kins) in celebration of freedom as plea bargain suggests is a mockery and has emboldened the urge to steal public funds by public officials. The argument of Pierce⁴⁰ is that corruption in Nigeria is simple not of 419 but a history of the cultural category. The challenge is that the label is used locally but it transcends regions, local moral communities, and traditions of moral discourse. Staphenurst and Kpundeh⁴¹ had argued that the strategies to control corruption comprise long-term processes that are as much about changing attitudes and behavior as they are about changing the institutions of a society. Nigerian society reproduces corrupt officials that occupy the public space therefore the consequences should be very severe to attract deterrence.

Society knows that they will not have any corrupt person to celebrate as a hero if their kiths and kins are

serving life imprisonment or are killed by the government for looting public funds and his/her property confiscated or destroyed. The argument advanced in support of plea bargain stating that Nigeria state gained more in all the plea bargain entered into with looters of the public treasury on the ground that a lot of time and resources were saved, the accused persons did not get away with the loot, the recoveries were substantial and left the accused persons with nothing as far as the proceeds are concerned⁴² are just argument that completely ignore the consequences of looting public funds that would have been used to provide social services that could prevent unwarranted carnage on Nigeria roads, hospitals, poverty, and general insecurity. Further, Obla⁴² supports plea bargain on the premise that government officials accused of stealing public funds engage the services of the best defense lawyers that EFCC is not able to contain in the law court and that prosecuting financial crimes requires a lot of money that EFCC may not have, therefore recovery part of the looted funds is considered as gain to the country. This argument is made against the backdrop of others who regard plea bargains as a mockery of the legal process in Nigeria,^{43, 44}. The consequences of corruption require securitizing the phenomenon. It should be treated under national security, and people killed for looting the public are seen as a process to uproot the fundamental cause for other malfeasances.

5. Conclusion

Containing corruption has been a major in Nigeria. People enter into the circle of government from their locality (even when they join politics from the city because of residence, they are required to go back to their various electoral wards for party registration) and return to their locality after service to the government. This nexus is important in the contextualization of the plea bargain. Ekeh and Achebe's portrayal of local society as being corrupt should call for concern about how the local people perceive plea bargains. Achebe was realistic in showing that people who beat up Odili the moralist were regarded as moralists before. Ekeh's compartmentalization of two societies in which one is moral and the other not is misconstrued since the primordial publics are aware of corruption and support it in the public realm. Therefore, a more punitive rule is needed that will instill fears in the society if corruption is to be eradicated.

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SOCIAL SCIENCIES

PARADIGM OF PHILANTHROPY IN THE HELPING PHILOSOPHY

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Abstract

The articles analyses helping philosophy in the context of paradigmatic philanthropy. The authors describe paradigm of philanthropy in the helping philosophy.

Keywords: social work, helping philosophy, paradigmatic changes, philanthropy.

The paradigm of philanthropic assistance was developed in Ancient Greece from the early stages of its design in the 7th-6th centuries BC and was declining by the 3rd century AD. The concept of "philanthropy" developed along with the social and individual practice of support. A person in need of help for a long historical time can be observed how the semantic meaning of the term changed in the context of helping practice. The concept of "philanthropy", as studies show, had a rather complex connotation, which was reflected in its "entry" into scientific circulation as a social term in the cognitive European and world space.

According to the research of the American cultural scientist, J. McCully, the word "philanthropy" appears in the 60th stanza of the tragedy "Prometheus" by the Greek playwright Aeschylus in 443-444 AD, but initially it appears as an adjective, *philanthrōpos*.

As a noun "philanthropy", *philanthrōpia*, "kindness, humanity, benevolence, love for humanity" appears in the early work of the philosopher Plato in "Eftifron" almost a century later, as researchers believe between 399 and 388/387 BC. However the use and understanding of this term, in its modern meaning, scientists nevertheless associate with the work of Aristotle "Nicomachean Ethics", which comes out approximately in 334-322 BC.

In Europe, this term appears in the late Middle Ages - the beginning of the Enlightenment, which depended on the development of humanitarian scientific knowledge of a particular country. So in the English scientific literature, this term will be recorded from 1620, and in the French, only in the 18th century. In the dictionary of the French Academy of 1762, the term "philanthropist" was recorded - "a person who, thanks to his natural character and kindness, is inclined to love every person."

However, one of the "first appearances" of this term, according to the publicist P. Valley, was recorded in 1578, when Stephen of Paris published Plato's work "Eftifron" in Latin and parallel to the Greek language, which made it possible to further introduce this term into the European scientific lexicon.

Considering the philanthropic paradigm of aid within the framework of archaic traditions as the basis for the development of subsequent paradigms and platforms of support, I would like to note that philanthropy, as a specific type of relationship between man and society, was formed on the basis of a new historical social experience, in new "post-clan" social historical socio-economic and socio-political conditions, and its semantic changes over time will also change.

The modern concept of philanthropy is considered both from the traditional positions and from the positions of a philosophical social historical justification.

The concept of philanthropy is based on two words "philéo" - I love and "ánthropos" - man". Considering this term from the standpoint of philosophical knowledge, the Russian philosopher A. Mozheiko identifies various connotations of "philéo", these are "love-affection, love-sympathy, love-friendliness", which express a certain attitude of the subject, on the basis of "conscious personal choice", that "Offers similarity and correspondence to each other, associated persons."

From the standpoint of socio-historical analysis, E. Benveniste in the semantics of the ancient Greek "philein" of friendship, defines the meanings denoting the relationship of the subject "with members of his group", thereby emphasizing the meaningful characteristics of intergroup interaction. It is this factor of "mutual friendship" that the American researcher R. Parker emphasizes, while comprehending the peculiarities of the use of the concept of "philanthropy" by analyzing the ancient Greek texts.

This synchronic-diachronic approach, from the standpoint of the interpretation of antiquity and its modern reading, determines the understanding of "philanthropy" as a historical phenomenon in the context of further historical transformations.

Thus, given the use of this term in ancient times and its understanding in modern research, it is possible to give a comprehensive definition of philanthropy in relation to our problem, support to a person in need of help.

Philanthropy is a manifestation of social relations among equal subjects who have a public focus on the "social organism", which is "humanity", as an ensemble, of "sovereign social subjects", as a measure of all the intentions and efforts of equal social interaction, which determines the essential characteristics of assistance man-in-the-environment.

However, the understanding of "humanity" as a certain community in the aspects of support problems still has specific historical forms of organization of the free population, which can be observed both in Ancient Sparta and in Athens, where a philanthropic model of assistance in a difficult life situation to a person is born and formed in need of help.

Of course, it must be said that this paradigm of aid was not homogeneous either in the ideology of aid, which was transformed both in Sparta and Athens over the course of historical time, or in the forms of practice, or in the institutions of support that have changed over the thousand-year history of ancient Greek philanthropy.

However, there are general tendencies in relation to the processes of philanthropic assistance implemented in such a long historical period, which allow combining various support practices for a person in need of assistance within the framework of unifying civilizational approaches.

First, the philanthropic model of assistance and support to the Man in Need was aimed at limited segments of the population who were in a privileged position in relation to other social groups. In Sparta, these were the "Spartiates", of whom, for example, during the reign of Lycurgus, according to the French historian A. Wallon, there were 32 thousand people, whose interests were served by about 220 thousand helots (state slaves), and 120 thousand perieci (free population subordinated to the Spartans).

In Attica, the population, according to the Encyclopedia Britannica, at the time of the census 317-307 BC. was about 500 thousand people, while free townspeople with wives and children accounted for 12% of the population. Given the fact that women and children did not have a legal status, neither in Sparta, nor in Attica, nor in Athens, the "philanthropy" extended in both cases only to the free, civilian male population from the age of 18.

In this respect, the person in need of help was, first of all, a free citizen who was given preferences of assistance from the authorities. With the loss of citizenship, with a decrease in social status, help and support no longer extended to this subject, despite his birth as a free person and belonging to the policy.

So, a Spartan who could not pay the tax on *syssitia*, joint friendly dinners, was excluded from society with a downgrade of status, transferred to the category of *hypomeyons*, ceased to be a citizen, and, therefore, was deprived of privileges in receiving assistance from the state.

In Athens, the loss of citizenship was also associated with poverty, when a citizen could not redeem his mortgages, which led him to slavery, for debts. Therefore, it is no coincidence that one of the first reforms of

Solon was *sisakhfia*, the abolition of debt slavery. However, in addition to economic factors, there were social factors, they included the ignorance of community / public holidays dedicated to the gods, in this case a person lost civil rights, and subsequently all preferences. Deprivation of civil rights on the basis of ignoring the holidays had not only sacred, but also political reasons.

With the development of ancient Greek society, one can observe how the government takes control of the organization of religious holidays, expanding them with dramatic performances. It can be observed that they carried additional functions in addition to the traditional, sacred ones - the functions of state "propaganda", when ideologemes of the ruling power are not only verbalized, but also manifested as a "public picture of the world".

It is perhaps no coincidence that one of the "first theatrical performances" of Aeschylus, who lived during the reign of Pericles, a reformer in the field of social support for free citizens, is dedicated to the "philanthropy" of Prometheus, where, as we have shown above, this word was recorded.

Perhaps this was one of the first examples of "state propaganda" of the ongoing social policy and its delivery to the mass consciousness. Theatrical performances gathered huge masses of people and went on for several days. So, according to the testimony of ancient historians, theatrical performances during the Dionysian holidays attracted more than 15 thousand spectators, they were held every day from morning to evening, while each viewer received a "day's earnings" for 2-3 obols daily for watching the performance. Almost the entire free population of Athens was attracted to view this performance, for example, according to the research of A. Wallon, in accordance with the census of Demetrius from Phaler in Athens 320 BC. NS. 20 thousand citizens were registered, excluding children, so theoretically the entire free population of the city could attend the performances.

The manifestation of "love for humanity" by Prometheus in the play, in real everyday life could have been not only "propaganda", but also "material proof" of the government's concern for citizens, not only by the very fact of staging the tragedy, but also by financial support that allowed them "bread your daily life" to earn not by work, but by entertainment. Therefore, the ignorance of these holidays by members of society was a clear disrespect and lack of loyalty to the authorities, to the public majority, and disregard for the costs that were allocated for the celebration and payment of benefits, which inevitably entailed deprivation of the status of a citizen.

Secondly, the philanthropic model of helping the privileged male population was aimed at seeking, either to achieve or preserve civil equality in a situation of constant economic stratification of society. In this regard, it was possible to observe how in a society of civil distribution, power was looking for ways to both social and economic preservation of a small free social community. The most common during this period was the "economic model" of maintaining equality, which was used by the authorities. This model is based on the use of the surplus value of those social groups that took an

active part in labor activity, but they were not subject to benefits, preferences from the state, since they were not equal members of society, since they were not political and legal entities. So in the Spartan state, such "social security groups" of free citizens were helots, who provided natural products to the Sparta so that he could pay the necessary tax and be equal among equals, take part in all social events. The annual tax paid by the Spartiat, thanks to the labor of the helots, in the era of Lycurgus, according to research by A. Wallon, was 82 medimna of grain (4,265 liters) per year. In Athens, there was a more "ramified" system of maintaining civil equality. On the one hand, the interests of a free citizen were served by slaves, but not state ones, but private ones, the number of which determined the volume of investments in his welfare.

On the other hand, these functions were performed by meteks, "neighbors in housing", migrants from other cities who were engaged in handicrafts, trade, but were not included in the category of free people of the policy, while paying all state taxes, of which, among other things, social payments to citizens of the policy in need of assistance, but this right did not extend to the metecs themselves. This model, the use of the resources of social groups not included in the circle of privileged citizens, was expanded in his political practice by Pericles. During his reign, the cumulative tax on cities under the naval protection of Athens was spent not only on the military needs of the union, but also on "social programs" for the free citizens of Athens, which led to the dissatisfaction of the allies, as noted by ancient historians.

The most common form both in Sparta, at a later time, and in Athens - were liturgies, a tax on wealthy citizens who had to either carry out subsidies, as is observed in Sparta, or take the costs entirely on themselves, as was the case in Athens for various social programs for free citizens, and not always in difficult life situations. However, the main thing in all these approaches was the search for equality between members of a free community and prevention of social stratification, in a situation of development of economic relations, leading to the intensification of processes of social exclusion, which in turn led to the disintegration of the society of civil distribution, which the authorities among free citizens.

Third, in this model of assistance, a three-part model of support and support for a person in need of assistance has developed: assistance from the state, through targeted funding of institutions, programs and targeted payments; assistance from the wealthy strata of the population, the aristocracy, in the form of taxes on them, liturgy, and self-organization of mutual assistance among various social groups, based on equality of use.

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TECHNICAL SCIENCES

LONGEST COMMON SUBSEQUENCE IN THE PROBLEM OF DETERMINING THE SIMILARITY OF HYDROLOGICAL DATA SERIES

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НАЙДОВША СПІЛЬНА ПІДПОСЛІДОВНІСТЬ В ЗАДАЧІ ВИЗНАЧЕННЯ СХОЖОСТІ ГІДРОЛОГІЧНИХ РЯДІВ ДАНИХ

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Abstract

Determination the similarity of data series is encountered in different applied problems. The work considers the determination of similar data series by using the method of finding the longest common subsequence in modification for data series, which are represented by fractional values. In this case, the general solution is defined as an intersection of sets of the obtained solutions for each of the nine used formulas for calculating admissible values of deviations between the series in question.

Анотація

Визначення схожості рядів даних зустрічається при розв'язанні різних прикладних задач. В роботі розглядається визначення схожих рядів даних з використанням методу визначення найдовшої спільної підпослідовності для рядів даних, значення яких представлені дійсними числами. При цьому загальне рішення визначається, як перетин множин окремо отриманих рішень за кожною з дев'яти використовуваних формул обчислення допустимих значень відхилень між порівнюваними рядами.

Keywords: LCS, distance, similarity

Ключові слова: LCS, відстань, схожість

Мета роботи. Визначити можливість застосування методу знаходження найдовшої спільної підпослідовності в задачі визначення схожих гідрологічних рядів, які представлені дробовими значеннями, з використанням різних формул розрахунку допустимого відхилення між рядами даних.

Основний матеріал. Існує велика кількість мір схожості та відстаней, що визначають ступінь близькості двох або більше рядів даних.

Longest common subsequence (далі LCS) – добре відомий метод, який використовує переваги динамічного програмування, та дозволяє визначити подібні послідовності. Опис алгоритму, його модифікації та приклади застосування можна побачити в роботах [1-5].

Класична версія LCS будує матрицю з огляду на схожість двох рядів даних. Візьмемо два ряди T і S довжини n і m , відповідно. Функція повторення виражається наступним чином:

$$LCS(i, j) = \begin{cases} 0, i = 0 \\ 0, j = 0 \\ 1 + LCSS[i - 1, j - 1], \text{ якщо } T_i = S_j \\ \max(LCSS[i - 1, j], LCSS[i, j - 1]), \text{ в іншому випадку} \end{cases} \quad (1)$$

де $1 \leq i \leq n$ та $1 \leq j \leq m$.

При використанні LCS на рядах даних, що представлені дробовими значеннями, постає проблема занадто жорстких умов при порівнянні. Тому

є актуальним питання використання LCS при аналізі рядів даних, що представлені дробовими значеннями.

Один із способів послабити порівняння в (1) є застосування LCS в наступному вигляді:

$$LCS(i, j) = \begin{cases} 0, i = 0 \\ 0, j = 0 \\ 1 + LCSS[i - 1, j - 1], \text{ якщо } |T_i - S_j| < \varepsilon \\ \max(LCSS[i - 1, j], LCSS[i, j - 1]), \text{ в іншому випадку} \end{cases} \quad (2)$$

При цьому постає питання вибору значення ε . В даній роботі значення ε будемо розраховувати за формулами 3-11.

$$\varepsilon_1 = \frac{\max(TS) - \min(TS)}{\max(TS)} \quad (3)$$

$$\varepsilon_2 = (\max(T) - |\min(T)|) * p \quad (4)$$

$$\varepsilon_3 = |\max(T) - Me(T)| * p \quad (5)$$

$$\varepsilon_4 = |\max(TS) - Me(TS)| * p \quad (6)$$

$$\varepsilon_5 = |Me(TS) - Me(T)| \quad (7)$$

$$\varepsilon_6 = Me(T) - \min(T) \quad (8)$$

$$\varepsilon_7 = |\bar{T} - Me(T)| \quad (9)$$

$$\varepsilon_8 = \bar{T} * p \quad (10)$$

$$\varepsilon_9 = Me(T) * p \quad (11)$$

де T – ряд, для якого відбувається пошук схожих рядів даних; \bar{T} – середнє значення ряду T ; TS – всі ряди даних, що приймають участь в аналізі, включаючи ряд T ; Me – медіана; p – параметр з діапазону $[0, 1]$, за замовченням 0,025.

Чим більше значення параметра p , тим більшим є допустиме значення відхилення ε , та достатньо віддалені об'єкти можуть бути визначені як схожі. В формулах (5), (6), (7) та (11) використовується значення медіани, оскільки воно є більш стійким до шуму, ніж значення середнього.

$LCS(n, m)$ визначає схожість між рядами T і S , оскільки відповідає довжині l найбільшої загальної підпоследовності елементів між часовими рядами T

і S . Перехід від міри схожості до показника відстані розраховується за формулою:

$$LCSdist(T, S) = \min(n, m) - LCS(T, S) \quad (12)$$

Для проведення обчислювального експерименту візьмемо 96 рядів гідрологічних даних, представлених щоденними показниками рівнів води. В якості періоду спільних спостережень візьмемо діапазон дат з 01.01.2010р. по 31.12.2014 р. В якості ряду, для якого відбувається пошук схожих об'єктів, візьмемо показники посту 79043 р. Дніпро, с. Неданчичі, Чернігівської області.

Для обчислень використаємо ряди даних у трьох виглядах: щоденні показники, щотижневі та щомісячні. Щотижневі та щомісячні показники отримаємо простим усередненням значень по тижнях та по місяцях. Для відбору найбільш схожих за всіма розрахованими відстанями рядів даних будемо сортувати за зростанням значення відстаней, розрахованих з використанням відповідних ε , та відбирати перші п'ять об'єктів, що посідають найвищі позиції. Таким чином отримуємо дев'ять множин по п'ять елементів в кожній. В результатуючій таблиці (табл.1) представлено лише ті ряди даних, які залишилися в результаті взятті перетину множин відібраних рядів даних.

Таблиця 1

Результати проведеного аналізу

Спосіб представлення	№ посту	Евклідова	LCS								
			ε_1	ε_2	ε_3	ε_4	ε_5	ε_6	ε_7	ε_8	ε_9
Щоденні	80123	2013	795	682	795	596	0	18	612	762	762
	80209	4041	1152	1072	1152	1010	8	79	1022	1129	1129
Середньотижневі	80123	757	141	117	141	103	0	4	107	128	132
Середньомісячні	80123	330	35	32	35	29	0	1	34	32	34

З табл. 1 можна побачити, що певні значення LCS, розраховані за різними ε , дали однакові результати, наприклад ε_1 та ε_3 .

На рис. 1 – 2 представлено графіки рядів даних, що визначено як найбільш схожі, до ряду даних посту 79403.

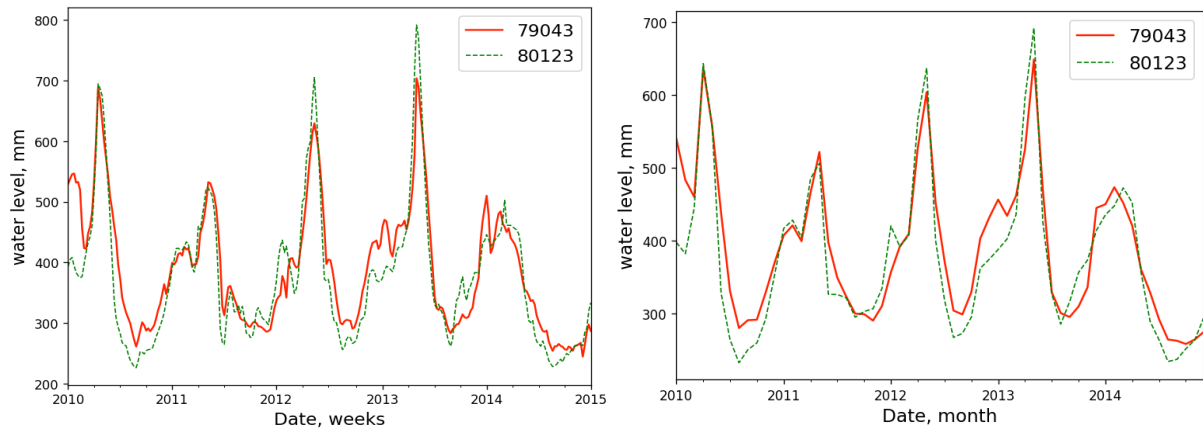


Рис. 1 – Графіки рівнів води по відібраним постам та посту 79043: ліворуч – за середньотижневими показниками; праворуч – за середньомісячними показниками

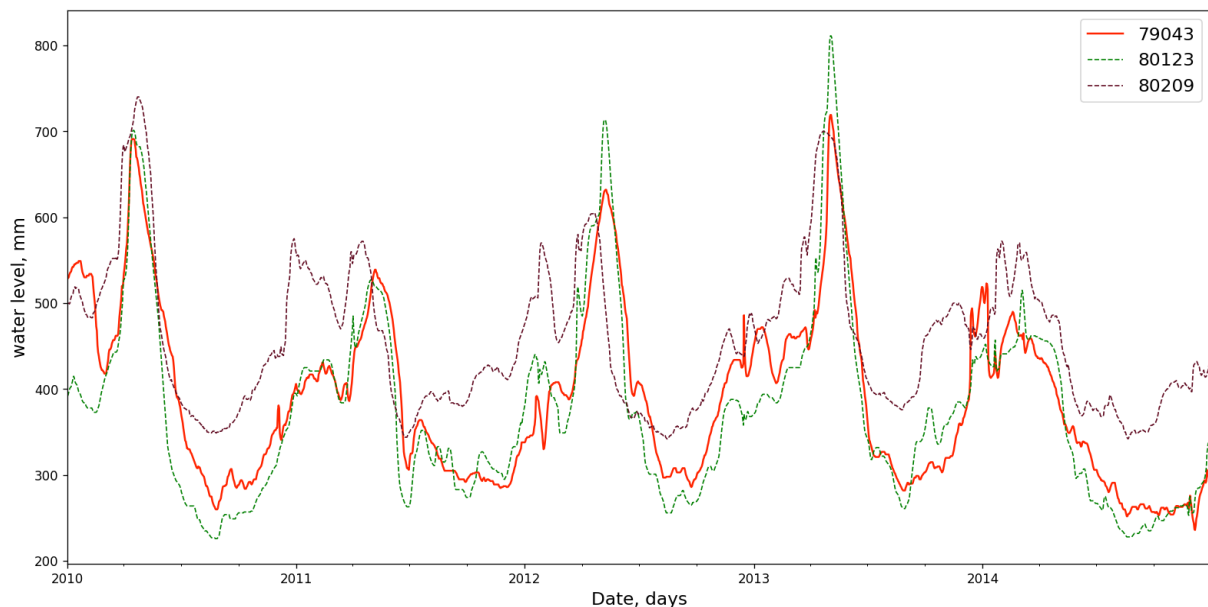


Рис. 2. Графік щоденних показників рівнів води за відібраними постами та постом 79043

Оцінка результатів. За результатами обчислень було встановлено, що найбільш схожим до ряду даних посту 79043 р. Дніпро, с. Неданчичі Чернігівської області є ряд посту 80123 р. Десна, с. Розьоти Чернігівської області незалежно від способу представлення даних. Окрім цього, значення оцінки MSE є також найменшою для пари постів 79043 та 80123.

Оскільки основною задачею в даному випадку було визначити до п'яти найбільш схожих рядів, то використовувані формули розрахунку ε можуть використовуватись для розрахунку значення LCS, але для використання LCS, наприклад, в задачі кластеризації рядів даних, доцільно використовувати формули обчислення ε , орієнтуючись на зальні характеристики всього набору рядів: середні значення, медіану, розмах, тощо.

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THE ROLE OF THE PYTHON PROGRAMMING LANGUAGE IN MODELING PHYSICAL PROCESSES

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Abstract

The study of physical processes and the modeling of connections create the belief in predicting what might happen to them. The Python programming language, which is widely used in all fields, can also be applied to the modeling of physical processes. Therefore, this article provides information on modeling physical processes in the Python programming language. In addition, its most needed models and their installation methods are widely described.

Keywords: Python, physical process, semiconductor, solar cell, modeling.

Model (lat. Modulus - measure, norm) - an image or model of an object or system of objects. For example, the model of the earth - the globe, the sky and the stars in it - the planetary screen, the photo in the passport can be called the model of the holder of this passport [1]. Mankind has long been interested in the creation of conditions for a prosperous life, the prevention of natural disasters. Therefore, it is natural for mankind to study various phenomena of the external world. Specialists in the field of science study only the features of this or that process that interest them [2]. For example, geologists study the history of the earth's development, such as when, where, and what animals lived, how plants grew, and how the climate changed. This will help them find minerals [3]. But they do not study the history of the development of human society on earth, as historians do. As a result of studying the world around us, inaccurate and incomplete information can be obtained [4]. But this does not prevent others from flying into space, discovering the secret of the atomic nucleus, mastering the laws of development of society, and so on. Based on them, a model of the studied event and process is created [5]. The model should reflect their features as fully as possible. The approximate nature of the model can take many forms. For example, the accuracy of the instruments used during the experiment affects the accuracy of the result obtained [6]. Modeling is the study of objects of knowledge (physical phenomena and processes) using their models, the creation and study of models of existing objects and phenomena. The method of modeling is widely used in modern science. It facilitates the process of scientific research, and in some cases becomes the only means of studying complex objects. Modeling is important in the study of abstract objects, distant objects, very small objects. The method of modeling is used in physics, astronomy, biology, economics to determine only certain properties and relationships of the object [7]. Depending on the means of selecting models, it can be divided into three groups. These are abstract, physical and biological groups. To the range of abstract models, mathematical, mathematical-logical, and similar models. Physical models include miniature models, various tools and devices, simulators, and so on. Let's take a brief look at the content of the models.

Physical model. Examples of a physical model are models that are similar in nature (size, speed, scope) to the nature and geometric structure of the process being tested, but differ from it in terms of quantity (size, speed, scale), such as airplanes, ships, cars, trains, hydroelectric power plants and others [8].

Mathematical models consist of mathematical and logical-mathematical descriptions of the laws of structure, interaction, function of living organisms, are constructed on the basis of experimental data or on a logical basis, and then tested experimentally. The study of mathematical models of biological phenomena on the computer allows to predict the nature of changes in the biological process under study. It should be noted that such processes are sometimes very difficult to organize and conduct experimentally. The creation, improvement and use of mathematical and mathematical-logical models create favorable conditions for the development of mathematical and theoretical biology.

The creation of the Python programming language began in the late 1980s and early 1990s. Guido van Rossum of the then-little-known Dutch CWI Institute was involved in a project to create the ABC language. Instead of Basic, ABC was a language designed to teach students basic programming concepts. One day Guido got tired of this work and for 2 weeks wrote an interpreter of another simple language on his Macintosh, in which he certainly mastered some of the ideas of the ABC language. Python also incorporated many features of Algol-68, C, C++, Modul3 ABC, and SmallTalk, which were widely used in the 1980s and 1990s. Guido van Rossum began spreading the language online. At that time, Steve Mayevsky was known on the Internet until 1996 for his website "Comparative Review of Programming Languages". He also liked the Macintosh, and that thing brought him closer to Guido. At the time, Guido was a fan of the BBC comedy Monty Python's Air Circus, and called the language he created Python after Monty Python (not snake).

Programming Mathematical and Scientific Computations Python can be used in large projects. Because it has no limits, the chances are high. It is also the best among programming languages with its simplicity and versatility.

There are many models of the Python programming language designed to model solar elements. These are Solcore, pvlib, solpy, Pypvcell and others.

Solcore is a modular set of computing tools written in Python 3 for modeling and simulating photovoltaic solar cells. Calculations can be performed on ideal, thermodynamic constraints by adapting them to experimentally determined parameters such as volt-ampere characteristics and luminescence in the dark and radiation. Uniquely, it can model the optical and electrical properties of many solar cells, from quantum wells to multi-pass solar elements, using the laws of semiconductor physics. Solcore cannot be added to the library normally. You must have Fortran installed on your computer before you can add it to your library. Because this module performs numerical calculations by calling the fortran compiler.

Pvlib python is a community-supported open source module that provides a set of features and classes to simulate the operation of photovoltaic power systems. Pvlib python aims to provide reference programs for solar-related models, including solar position, open sky radiation, radiation transposition, DC power, and DC-AC conversion algorithms. Pvlib python is an important component of an evolving ecosystem of open source vehicles for solar energy.

The Solpy module is a module designed to study and model the environmental effects of solar panels.

In conclusion, the python is most widely used program in the world. So, we can use from it from any field such as physics, statistics, biology as well as math. Especially in the physics, there are a lot of modules to model the process in the semiconductor devices. In consequence, Python is getting used to simulate and model the any engineering devices instead of the standard programs.

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