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CONSTRUCTING A MODEL OF NATIONAL PRODUCTION SYSTEM FOR BUILDING A CIRCULAR ECONOMY FOR INTERNATIONAL TRADE INVOLVEMENT

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Abstract. The paradigm of "unlimited growth" capitalism leads to an aggravating the problem of a natural resource shortage, an increase in waste and general pollution of the Earth. The concept of a circular economy (CE) is an alternative to this; it implies a transition to closed production and consumption cycles. The purpose of the article is to supplement this concept with ideas of integrating several rationalizing production models of the CE building at the national production system level, taking into account the country's participation in international trade. These model production models are "flexible custom manufacturing", "distributed manufacturing" and "lean manufacturing", which also means the widespread involvement of small and medium-sized enterprises. The use of digital technologies for a new quality of communication, as well as the creation of sharing centers, in order to achieve greater organizational and technological complexity of the production system is required. The CE building must take into account the country's participation in international trade. Attention is focused on the fact that the CE will have a different effect on certain types of international trade, in particular, it will stimulate such trade as: materials for processing, secondary raw materials, technologies, projects of finished products, R&D services. Purposeful national and global policies, expansion of international cooperation and support of developing countries are needed in order to increase the positive contribution of international trade to CE building. Practical recommendations for the CE concept implementation are proposed, including the creation of: information infrastructure for production networks; digital platforms for interaction between producers and consumers; industrial parks, clusters and incubators for new industries, as well as technological, digital and organizational innovation stimulation.

Keywords: circular economy; international trade; industrial production; models of organization; innovations

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Additional disciplines: ecology and environment; organization of production; information and communication.

1. Introduction

The economic paradigm established in XX century and extrapolated in the beginning of XXI century is primarily focused on maximization of consumption. Under easing of monetary conditions and growth in money supply, monetary stimulation of demand, which was underpinned by continuous product innovations, the development of consumerism becomes disappointing in the modern society, and growth in consumption – alarming, especially in terms of ecology. In conditions of the traditional “linear economy” (“take-use-dispose”), the growing consumption exacerbates the problems of scarcity of primary natural resources, including energy resources, which requires urgent alternative. The unrestrained exploitation of nature’s gifts during previous centuries has brought a high level of prosperity to humankind, but now, against the background of climate changes, global population growth, urbanization and other challenges, it causes deterioration of environment to the point where it becomes dangerous.

Due to the aggravated situation, the efforts to process waste, introduce resource and energy saving technologies, and form new production, supply and consumption chains have increased, which, in general, was named circular economy (CE). This concept implies recycling and cyclic use of materials, minimization of primary natural resources use, transfer to closed loop production and consumption, with due consideration of the local conditions. CE building is aimed to satisfy the growing demand, while achieving environmental sustainability by lowering the level of resource depletion and reducing waste generation and emissions. This initiates a new round of industrialization as a part of the Fourth Industrial Revolution and other technological trends, because it is technologies that will enable to build an industry with minimum adverse impact on the nature.

Accepting the inevitability of changing the production system, it is critical to understand that it is fundamental to the whole economy; therefore, a large-scale transition to CE may serve to overcome major economic problems and create conditions for the transfer to a new long cycle of economic development. The creation of a new production system, among other things, is based on the integration of different production models for CE building at the national level. On one hand, a transformation of the production system in the context of transition to CE will significantly change the structure of international trade. On the other hand, it is not every country that can take into account participation in international trade, which might facilitate as well as complicate the process of such economy building.

2. Literature Review

The growing pressure from the human species to the environment through resource extraction and waste generation has led to the revival of the long-standing ideas of optimization of production and development of new concepts. In the scientific, expert and political discourse, along with the term “Circular Economy”, they use the definitions “Closed Loop Economy” and “Cyclical Industry”. The term “Closed Loop Economy”, representing the economic model with minimization of waste, may give rise to different understanding of closeness. The term “Cyclical Industry” can be considered as the one, which supplements the concept of “Circular Economy” in the relevant sense.

The concept of CE is gaining momentum in the development of government policy and corporate strategies in academic and expert circles. This attractive concept is considered as a potential solution of the creation of the production system with more efficient use of resources. Being positioned as an approach which enables to create new business models and provide benefits, simultaneously reducing the pressure to the environment, CE is backed up by the government and the enterprises in private and public sectors (Velenturf, Purnell, 2021). CE is highly relevant for the achievement of the most part of sustainable development goals, which becomes a matter of global significance (Schroeder, Anggraeni, Weber, 2018).

CE concept has been developing over nearly half a century and it has been gaining popularity in recent years, and it has already become a theoretical and practical basis for government policy, organization of

production systems, supply chains, consumer infrastructure, and creation of new value propositions, businesses and social structures (Korhonen, Nuur, Feldmann, Birkie, 2018). CE is promoted by multiple countries and international organizations, but, in practice, it has significant economic, social and technological constraints; therefore, it often remains a set of ideas (Korhonen, Honkasalo, Seppälä, 2018).

Restructuring of production sectors as a part of CE is, first of all, encouraged by climate and resource challenges, which enables to consider CE as a new paradigm for sustainability. Environmental criteria urge the transition to CE, but they should definitively be agreed with the economic and social components, in order to ensure economic growth and maintain the level of prosperity (Hysa, Kruja, Rehman, Laurenti, 2020). This is due to the fact that CE reveals a new vast sphere for entrepreneurship and innovations, and even the whole areas for a creation of innovative technologies (Barros, Salvador, 2021). This requires innovative capabilities from business, which is a driver of knowledge advances.

CE unleashes the potential of the Industry 4.0 to achieve the sustainability criteria and strengthen the competitiveness of enterprises as well as to improve organizations, technologies and management (Enyoghasi, Badurdeen, 2021). Considering the production as a complex multilevel material and technical, information and socio-economic system, it should be noted that the transition to CE includes its modernization and constitutes the beginning of a new life cycle of enterprises. CE building is based on the consideration of local conditions; therefore, its outcomes will determine the sustainable development of territories (Bassi, Marco Bianchi, Guzzetti, Pallaske, Tapia, 2021).

Transition to CE is accompanied with complex introduction of new business models, their gradual upgrading to the required efficiency levels, which requires in-depth optimization (Geissdoerfer, Pieroni, Pigosso, Soufani, 2020). In order to form CE and obtain the expected benefits, it is also required to overcome multiple technological, market, institutional and social barriers (Grafström, Aasma, 2021).

CE covers almost the entire range of industrial sectors. For example, this concept is relevant to ensure circulation of plastics, create closed loop production and consumption of packaging, reuse materials, and especially, recycle plastic waste. CE approaches are relevant for construction sector, pharmaceuticals, textile and apparel industry, chemical and petrochemical industry, electronics and computers, production of metals, leather, paper, automobiles, etc. Therefore, it turns into one of the key trends in economic transformations related to industrialization, and it can also be considered as a strategic focus for economic recovery from the prolonged recession and its modernization in terms of sustainability. However, there are some remaining concerns about possible adverse impact of CE on the environment and society. Different views as well as constructive criticism are needed to find the right way and develop government policy (Valenzuela, Böhm, 2017). Of course, objective constraints should be taken into consideration. Thus, for example, CE will lead to an increase in overall production output, including creation of products, recycling of waste and out-of-use products. Moreover, certain products are impossible or inexpedient in terms of quality and energy consumption to be recycled, which reduces the advantages of CE. In this case, the alternative material management strategies are required as well as recycling for other use and technological advancements.

CE concept gains international importance as a response to global challenges. Country's progress towards CE building becomes more extended, including not only the leading developed countries. In general, one can say that there is a prospect of global CE (Velenturf, Purnell, Macaskie, Mayes, Sapsford, 2019). This implies consideration of the global contest, attracting certain countries to the worldwide trend, establishing new areas of international cooperation. The discourse on this issue is maintained by EU, UNO, OECD and transnational companies. EU, for example, actively engages Member States to the building of CE, forming a single strategy and rendering individual support to countries, thereby ensuring a common progress (Lazarevic, Valve, 2017).

As far as CE is understood as a basis for building the global paradigm for sustainable development, the policy of EU and China is of great interest. The driving forces, problems and the course of circular transformations are diverse in the EU and China, but they are interrelated (Ranta, Aarikka-Stenroos, Ritala, Mäkinen, Saku, 2018). The Chinese and European points of view of CE have common conceptual basis and demonstrate not only a lot of similar concerns, but also conceptual distinction, which should be taken into account in international policy-making (McDowall, Geng, 2017). Despite certain distinction between global players, an analysis showed that it is possible to consider CE as one of the bases for creation of the global model of sustainable growth, which also makes it

necessary to cooperate internationally. This is particularly true for the cooperation between the developing countries, for which the issues of CE building are kept up to date in the context of industrialization (Batista, Gong, Pereira, Jia, Bittar, 2019). This applies particularly to foreign investments and technology transfer as a part of international cooperation.

Despite a potential link between trade and CE, the existing studies on this issue are limited. The transformation of production chains will lead to significant implications for the international trade, including primary and secondary raw materials, technologies and other knowledge, finished products and components. CE building in a particular country should not be considered separately, without taking into consideration the link between the internal and external aspects, implications for international positions of a country, new threats and opportunities for national companies (Gaur, Mani, 2018). It is essential to ensure dialog, institutionally support CE formation at the global level and encourage the developing countries to the respective industrial modernization.

3. The Research Objective

Taking into consideration the need to overcome the shortcomings of the existing economic paradigm and implications of the prolonged recession and COVID-19 crisis, this paper is aimed to develop CE concept through supplementing it by the innovative ideas on the integration of several production models at the national level, taking into account participation in international trade.

4. Theoretical Framing and Methodology

In this paper, CE as a concept is related to the national production system, which could be applied to almost all its sectors, first of all, production of consumer goods. The production system is abstractly understood as creating benefits for society (social production), but not as operational resources of an enterprise. CE, in general, is understood as a new type of economy and, in a narrow sense – as the production where waste and out-of-use products are recycled to the maximum extent, creating a full circular cycle of production-delivery-consumption-recycling to achieve waste prevention or minimization. It is also possible to move from consumption to temporary use. Recycling and reuse imply the respective organization and management, require technologies and infrastructure, and often need interaction with consumers as well as new system of cooperation with other enterprises. The existence of different types of CE, for example, strong (creation of the full circular recycling loop) and weak (secondary resources supplement the primary ones) circularity (Johansson, Henriksson, 2020).

Further, the paper looks into the integration of the production models, which are diversely understood: 1) as certain concepts of production management; 2) as a set of organizational forms, methods and procedures, which enable to ensure production process; 3) as a description of the relationships of this process. The integration of production models will be understood as their combination and fusion to build more complex production system. The ideas suggested in this paper are more suitable for consumer goods sectors; although, many of them are also relevant for production of capital goods.

In order to achieve the goal of this paper, it is required, besides a metaanalysis of previous best practices in the field of CE and an application of the methods of qualitative analysis (historical, comparative, functional, etc.), a justification of the integration of production models to build a new quality of CE, which is based on structural approach. The monitoring of the transformation of production systems in the U.S. and China as well as the innovative experience of EU countries and negative consequences of de-industrialization of former USSR countries became the empirical basis for the study.

CE implies a full cycle of production and recycling and, by its nature, it is multisectoral. Therefore, the development of new production models does not fall within the scope of standalone science or theory, but represents an interdisciplinary area of the study, including: production technologies and networks; digital technologies and platforms; logistics; economic geography; sectoral markets; ecology; sociology; international economy. The issues of CE building are structured not by sciences, but by problems.

The study is methodologically based on the evolutionary approach to the development of production

systems. The following concepts made a theoretical basis for the study of CE and integration of production models: sharing economy, smart specialization, on-demand economy, digital platforms, Industry 4.0, innovation ecosystems, etc. It is empirically backed up by the study of global technological trends, in particular the Internet of things.

5. General Explanations

CE concept represents the real alternative to the unsustainable production systems and is able to radically change the economic paradigm in general. To achieve this, one should proceed from the drawbacks and contradictions of the modern form of capitalism of “unlimited growth”. First of all, it is a promotion of excessive individual consumption, aggressive marketing and approval of the lifestyle oriented towards consumerism, accumulation of wealth as an end in itself, excessive and corrupting desire for comfort instilled at the level of values and beliefs, and, therefore, it reinforces individual decisions (to the maximum extent –“first prosperity, and then morality”). This value framework includes pragmatism and selfish interests, inherent in capitalism, where the balance with altruism and solidarity is often upset. Consumerism is supplemented by the continued diversification of the product range and emergence of innovations, leading to the change in generations of products as well as emergence of products with the “planned obsolescence”. Forcing more money into circulation increases consumption, and consumerism created the economic culture. Monetary stimulation of demand led to overconsumption on account of future earnings, which undermines the potential for the long-term growth. Transformation of this lifestyle will lead to decrease in prosperity, therefore it is politically supported.

Of course, the more and more amount of waste is recycled, but the pressure on nature increases (Figure 1). With the systematic development of composting (about 6% of GLOBAL waste), an increase in incineration (over 11%) and other methods, open landfills are in the order of 33% of GLOBAL waste, and recycling is over 13% global average.

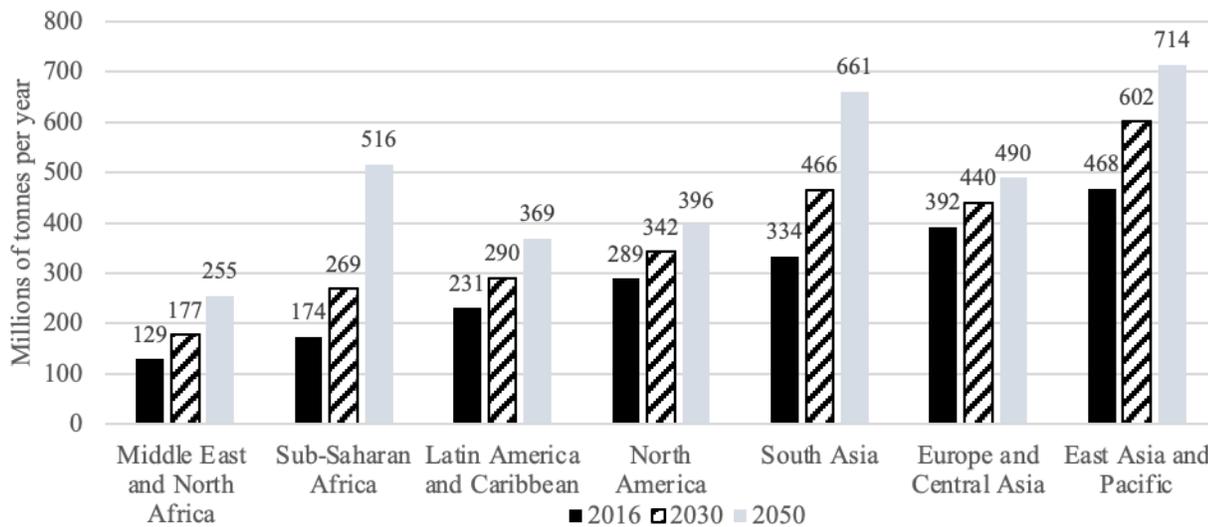


Figure 1. Projected waste generation, by region

Source: The World Bank

The problem in ensuring the sufficient production volumes was addressed in XX century. Humankind has achieved a high level of wealth creation, but its uneven and sometimes extremely unfair distribution remains widespread. Ill-considered stimulation of the demand by monetary and credit levers, apparently, is reaching its limits. The levels of public debts and global debt in general are breaking the records, which enables to compare

them with a pyramid, gives birth to doubts about their repayment and undermines the credibility of financial institutions.

Even in previous centuries, “fevers” and “bubbles” were inherent in capitalism, and, in the modern economy, they become of permanent nature. The predominance of financial sector puts an enormous burden on industrial sector, leads to disproportion, encourages unproductive entrepreneurship, especially in the light of modern consumption. Together with the excessive money supply, it leads to an increase in prices and makes long-term planning impossible. Economy has already been dependent on the artificial maintenance of the demand for a long time, and it is permanently in turbocharging mode owing to printing money. In these conditions, it is impossible to talk about the high quality of economic growth, even given the employment and income growth. The growth, in fact, is achieved on account of worsening of economic structure and stimulation of demand. As it is well known, it gave birth to the global financial crisis of 2008-2009 and prolonged recession that it turned into. Since the late XX century, it has become clear that overcoming financial crises by pumping market assets with money leads only to the inflation of stock exchanges and increase in prices for the assets, and it does not revitalize economy at all. Instead of eliminating the causes, the imbalances are exacerbated.

The capitalism of “unlimited growth” triggered the factors that determine high production intensity, growing demand for resources and amounts of waste. Environmental problems have become more acute in comparison with XX century, and climate changes have become a real threat. The world population is rapidly increasing, and, in a number of countries, it is reducing and aging, which, in conditions of the modern economic paradigm, gives rise to enormous challenges posed by pressure to resource base, inequality, poverty and migration. This is also facilitated by technological changes. Human being became focused on obtaining of money to achieve the modern standard of living. Under the pressure of multiple adverse factors, people today face a number of ambiguous changes of mindset, existential and even moral problems. The resulting economic situation is exacerbated by the political crisis, which has been clearly evident since the beginning of XXI century (rise in corruption, ignoring the problems, inability to develop new approaches, etc.). Against this backdrop, risks of pandemic instability and further recovery increase.

Special mention should be made on the international trade. Since its creation, it has already been the most powerful factor in the enrichment by big capital-holders, and only partially – the factor in raising the population’s welfare level, and, in recent centuries, it has become the main engine for progress. In XIX-XX centuries, it has been international trade that facilitated the rapid development of many countries as well as their modernization and transition to the civilized state. In XX century, the national specialization gradually expanded, the internationalization of production reached the highest level, which acquires the form of the global production network, global value chain, and global supply chain. In order to win the world market, the countries began to focus on the development of a limited number of strategic sectors (“national champions”), especially on increasing their export capacities. This turned into fierce competition, where just a small number of countries became winners, reinforcing their advantages by economic as well as financial (being producers of money) and military-political methods. This led to economically uneven world, which could not be eliminated by economic order that was conceptualized in the second half of XX century.

Turning of South-East Asia, especially China, into a global production factory has consolidated the system of the global division of labor, which, in many countries, led to suppression of the local production activity (at the same time, only a few countries have R&D potential and expertise to create innovative products to compete in these areas) and development of international business, which designs and sells products or even just deals with resale. Initially, industrial recession undermined the basis for economic growth in many countries, which was counterbalanced with financialization and development of the services sector. Then deindustrialization brought to structural imbalances, large-scale unemployment, and disqualification, decline of middle class and polarization of population. These problems became clearly evident during the global financial crisis of 2008-2009. COVID-19 pandemic, which became a global economic shock, once more demonstrated the irrationality of the global trade paradigm, country’s dependence and fragility of global supply chains, affecting even the “national champions”.

In general, pernicious antagonism of the suppliers of raw material and technological goods remains on the world market as well as the “bullish” price competition in the context of all monetary features of modern

economy. It should be taken into consideration that the developed countries produce money, have absolute technological advantages and continue expansion in the world markets. As for the suppliers of primary resources, they are predominantly represented by the developing countries, seeking to increase their export capacity to ensure import. At the same time, the world natural resources are very unevenly used.

The economic competition on the world markets has become “violent” with a domination of large companies and financial institutions, forming the whole “empires” of assets. Many product and resource markets have monopolistic or oligopolistic structure. In these conditions, it is difficult to talk about real capitalism and free competition. Recently, “wars” of the vaccine for COVID-19 portend even greater distortion from the principles of free market. For the above-mentioned economic reasons, protectionism ideas are becoming more active and increasingly embodied. The problems with free market, on one hand, and protectionism, on the other hand, mean the crisis of the global trading system. There are risks of the world fragmentation and “national egoism”.

In view of the multifaceted nature of the prevailing crisis phenomena in the economy, raise a number of issues. Is it possible, based on the old paradigm, to ensure the revival of the national economies after the decline and crisis of COVID? Is it possible to build capacity for future growth? The answer to this question can be given by means of “model solution”. It cannot be expected that the irrational production approach or inflating new bubbles, for example, around “green economy” will become an adequate answer. It is impossible to build a new economic structure based on the artificially inflated services sector, created in pursuit of comfort and idleness, based on the monetary and credit levers. The only way which can be seen is a radical reconstruction of the economy and transition to another production system, which should: become a basis for economic restructuring; allow meeting the requirements to sustainability and make progress in addressing social problems related not only to unemployment, but also to stimulation of activity.

CE concept seems to be the basis for new national production system, facilitated by the implementation of the large-scale recirculation schemes in a number of countries. CE initially was focused on minimization of waste, but it gradually turns into a broad-scale approach to the organization of production. Therefore, it is proposed to reconsider overall concept of CE as the basis of the national production system, supplementing it with the integration of a number of other models. This requires a new structural approach to be applied in production, economic organization and the whole complex of relations.

CE is oriented towards production and using the products in the most efficient way, to manage waste economically and eco-friendly, and to recycle it to the maximum extent. Following this orientation, the key idea of the creation of a new social production system is a transition to the closed loop production and consumption with due consideration of local conditions. At the same time, the production structure should be diversified and, by its saturation, it should correspond to the diversity of modern consumption, subject to the following formula: “economy should be aimed to produce all things that people need”; “economy should produce exactly the things which are needed by a particular consumer, in the quantity and of the quality which is requested”. This implies the integration of, at least, the following three models:

I – flexible individualized manufacturing, which is built on an interaction with every consumer and consideration for the specific nature of his demands. The model can include a wide range of consumer goods; it implies an active use of modern technologies which enable to achieve the appropriate level of costs even in case of small series. Small-scale production can be localized at the areas of consumption;

II – distributed manufacturing which is appropriate for the manufacturing of the large sophisticated products. Besides the application of state-of-the-art technologies, the model assumes development of the associated cooperative production, reconstruction of the network of relatively small-scale enterprises, coalescing around the innovative and technological (with shared access system) centers;

III – “lean manufacturing” (*lean production*), the well-known concept of which, besides elimination of all kinds of losses, should be clearly focused on the resource and energy saving. Comprehensive intensification of production, reduction the time of business processes, including interactions with consumers and production partners are also expected.

The above-listed models present a structural framework for organization of sophisticated production system – CE 2.0 (Figure 2). At the same time, the idea is that the production will be primarily focused on the base of small

and medium enterprises associated between each other. The production in the sectors where it is impossible to avoid large enterprises is assumed to be developed in new forms, for example, as a part of national or international industrial parks, but not on the basis of market principles, avoiding aggressive competition.

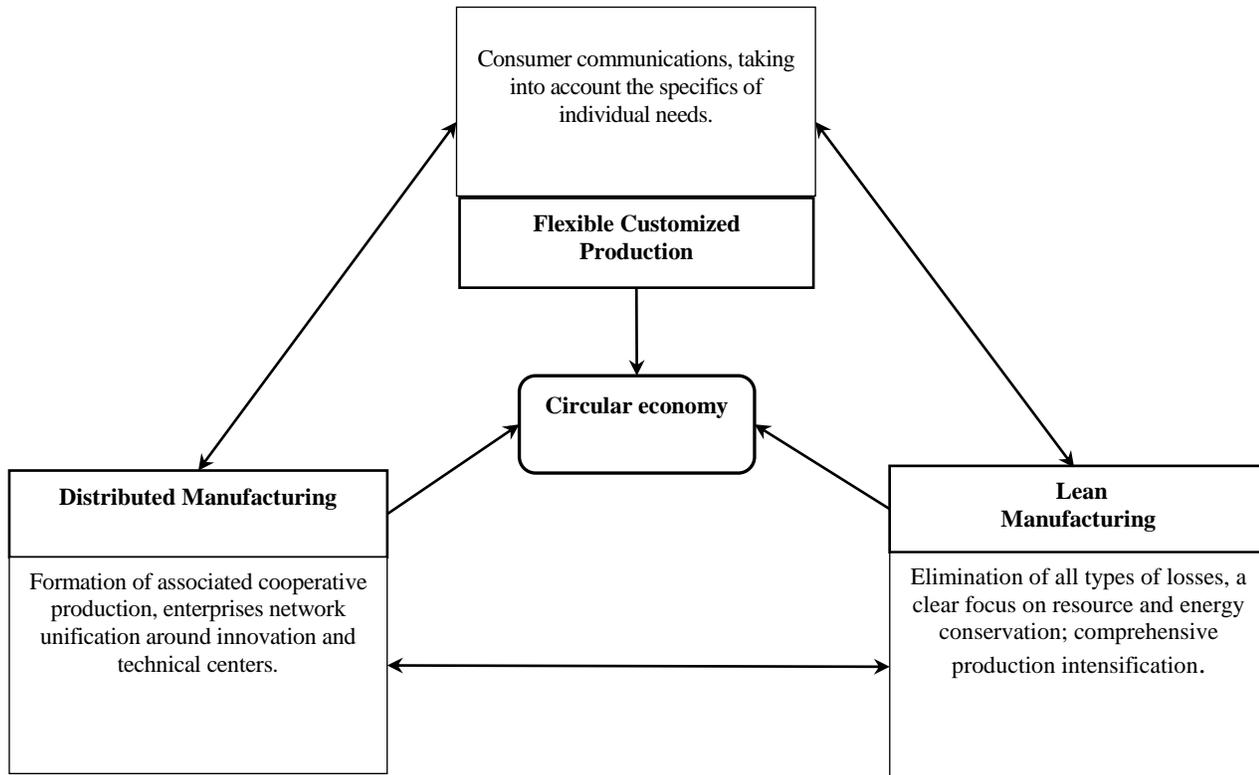


Figure 2. Structural frame for CE building based on the integration of rationalizing production models

Source: developed by the authors

The suggested production approach CE 2.0 implies an application of state-of-the-art technologies (robotic technology, additive technology, etc.), which enables, to the full extent, to unleash their potential not for domination of individual companies, but for extensive socialization and complex redistributions. More sophisticated system requires the respective organization and management; therefore, the information and communication technologies (ICT) and special digital platforms for the interaction of producers between each other and with consumers will be of crucial importance. Of course, the innovativeness is imperative. However, it is not only product innovations, matching the “abundance” demand, but also the structure-forming technological, organizational and digital innovations, which involve transition through modernization and enable to achieve the required level of resource and economic efficiency. This implies an interaction not only with consumers, but also with science. It should be noted that the approach presented is appropriate not only for large cities, but also for the medium and small towns, which will enable to radically change the territorial economy.

The suggested approach to organization of production system does not mean a setting of the avatar, but it promotes the idea of reducing the dependence and increasing the level of the country’s self-sufficiency, smoothening over the flows of neoliberal doctrine. Speaking of its other potential advantages, at the macro level, the emphasis should be laid on: 1) stimulation of new demand and new investments in production, rationally reallocating the accumulated financial capital; 2) correction of imbalances in the country’s foreign trade; 3) equalizing effect in terms of reducing inequality and poverty; 4) development of certain territories, enhancing

their natural specialization in the domestic market. This will produce an effect of the long-term sustainable growth, improving its quality (rates, employment rate, and investment structure), not on account of monetary manipulations, but through changing the basis - production. This will encourage entrepreneurship and innovations, and will help correctly use the advantages of capitalism in improving people's lives. At the mezzo-level, this will revitalize competition, and state-of-the-art technologies will be used not for domination and shrinking labor market. Owing to the new understanding of CE, it will become possible to produce even greater effect in terms of saving primary resources and reducing waste and emissions. However, greater attention should be paid to possible beneficial social effects. First of all, new production system enables to launch capitalism of the parties concerned, "social capitalism", as it will be focused on human being, his needs and capabilities, i.e., achievement of a new level of economic freedom (having needs and opportunities), working without exhaustion, with interest, at maximum capacity, creatively and developing. Around this, it is possible to create integrated ecosystem of human activities, which can be institutionally configured to equality and support to youth. In social terms, this will strengthen the middle class and revitalize democracy.

The proposed changes to the national production systems should evolutionally emerge and germinating "from bottom to top". This does not rule out the proactive role of the State and its support. In terms of prioritization of the support for the development of individual sectors, the criteria of their selection are: significance in terms of job creation, human development and quality of life; growth potential, development of the country's domestic market, import substitution; multiplier effects on the economy, boom in innovative sector, creation of new production capital; innovativeness and science intensity, creation the stocks of new knowledge and promising innovations. Of course, in order to develop the sectors, it is critical for the particular country to have its own potential. The assistance in the development to the countries with insufficient potential will be more efficient on account of "small-scale" industrialization.

In terms of the implementation of CE 2.0 and previously mentioned models, it is critical to ensure new associated forms of production organization based on digital platforms, which enable to engage more extensive number of small enterprises. It is suggested providing the access to production facilities, built on the state-of-the-art technological basis, on account of the shared use centers. The important factor is an access to information and knowledge.

Global expansion of CE paradigm is not limited by domestic economy and it transforms global production chains. Therefore, one of the critical issues in the context of CE is the development of international trade, as evidences by the experts of the World Economic Forum, OECD and World Trade Organization. On one hand, participation in international trade has a great impact on the domestic production, which can facilitate or impede the progress of CE. On the other hand, CE can lead to the optimization of the country's foreign trade; it can also reduce import and increase export earnings, including resources.

It can be assumed that CE has different impact on certain types of international trade. First of all, this will reduce international flows of finished products, which might also affect the components. As to the raw materials, the growth of the trade volumes is expected for the following goods: second-hand and damaged products; expired products; natural resources (primary raw material); resources obtained from recycling (secondary raw materials); waste and scrap. Naturally, the trade in the goods for recycling and production will increase, namely: technology and hardware, diverse knowledge for this purpose as well as services (mounting, maintenance, R&D, economic surveys). An emphasis should be laid on the fact that the use of state-of-the-art technologies will result in the growth of international trade in the designs of new products, which can be produced at the local level. Most probably, in conditions of CE, international trade will have new comparative advantages. It will be especially related to the development of production and recycling technology as well as design of new goods based on R&D. This, apparently, will be a basis for new economic expansion. In general, it is reasonable to expect profound qualitative changes in the structure and volumes of international trade, which will reconstruct the entire global economy.

In order to increase a positive impact of the international trade on CE building, it is necessary to have national and international policy built on new goals. It should be accompanied with the exchange of experience and best practices, unification of new standards, enhancement of monitoring and logistics. The global risks of the transition to CE should be taken into consideration, for example, strengthening the technological positions of the

developed countries greater dependency on export of the developing countries' resource, rising inequality, destabilization of resource markets, intensifying contradictions due to the uneven availability of countries' resource, etc. These risks are quite possible and require global response, because it provides individual advantages from CE for certain countries as well as the global ones. The effective assistance in the development will ensure more steady global progress of the developing countries, which is possible only taking into account a diversity of countries, but not the global unification.

National strategies of CE building will not be able to work separately. The creation of a new production system in the countries will be accompanied with the intensification of the international cooperation in the following areas: development of technologies, cooperation in hardware production and waste recycling; professional training of specialists; harmonization of the standards of production, transportation, product quality, data protection, etc.; security protection, etc. Therefore, the transition to CE should enhance the quality of international relations. The highest level of such cooperation can be achieved as a part of creating new (regional) areas of economic integration, taking into account the nature of CE and the proposed production models. The intensification of international cooperation, being new in its content, during the transition to CE, could be viewed as the next wave of globalization, which, in many aspects, will be related to the sphere of knowledge and innovations, and should become a powerful driver of development. In this respect, it is fair to ask: Is the global CE, i.e., the cycle closed on a planetary scale, possible? Apparently, it is possible in future, but, for this purpose, it is necessary not only to seek minimization of the use of primary resources, but also address a complex of problems of their fair distribution, global unity in combating climate changes, solidarity in addressing social problems, coordination of the policies of CE building. It can be achieved exceptionally based on the planetary thinking, mutual respect for the interests of the countries and confidence building. This should be the focus of the new trade policy, technological and industrial cooperation as well as the development assistance policy. It is necessary to ensure strong, inclusive and fair global recovery.

6. Discussion and Practical Recommendations

Therefore, the transformation of social production systems as a basis for a new economic paradigm deserves the priority attention. So far, the discussion on CE looks non-systemic, but, at this initial stage, the pluralism of opinions is helpful. The most important thing is to achieve unity on the issues of the need to change the models of production systems in the context of CE building and to develop different thinking, which will enable to go through "reshaping" the established paradigm of "linear economy". This can be implemented only through the destruction of the old and reconstruction of the new understanding of the role and configuration of the social production system.

The discussion should be focused on a number of high-priority issues, including: transformation sequence of production systems (depending on the level of the country's industrial development); development of the mechanisms for transition to CE, new institutional configuration of the economy; support to technological, digital and organizational innovations, which form a new production structure; support to entrepreneurs, training of specialists; creation of new industrial areas and clusters of new type, etc. In particular, this is related to the developing countries that have no experience in industrialization. They need an access to technologies, development of human capital and entrepreneurship culture.

The more general issues of CE building are: building the efficient markets based on the economic relations, establishing traditions instead of dominant directions; counteracting new types of monopolization; correction of imbalances; realization of the supportive and initiating role of the State, etc. The biggest problems of the transformation of production system are associated with the creation of the large industrial production, which can be only partially downscaled (on account of the distributed manufacturing of the components). That is, initially, a part of the sectors will still have a domination of large enterprises. However, they should meet the new environmental and social requirements. Such large manufacturing complexes can in theory be the subject of international cooperation.

The practical measures for the launch of a new production system comprise: 1) creation of information

infrastructure for production networks; 2) creation of digital platforms for the cooperation between producers and consumers; it is related to ensuring interregional and international cooperation; 3) development of industrial parks and incubators for new production. One of the major challenges is to support small and medium enterprises, which should become the drivers of new approaches and innovations.

8. Conclusion

Modern situation in the global economy, associated with the prolonged recession and crisis due to COVID-19, should become a turning point. Trying to eliminate the acute problems of the existing economic paradigm (consumption growth, imbalances, predominance of financial sector, stimulation of demand, irrational economic exchange between the countries), it is proposed to lay emphasis on the transition to the closed local manufacturing cycles in the context of CE building. Among all other things, it should include the integration of the models of flexible individualized, distributed (associated) and “lean” manufacturing; for this purpose, the required technological capabilities are available today. First of all, the emphasis should be laid on the human development, creation of new opportunities for self-realization, creative labor, and high-quality jobs. This will have considerable advantages in terms of addressing economic and social problems as well as enhancing the quality of economic growth. CE building and transition to the closed local manufacturing cycles will have a great impact on the volumes and structure of international trade, including trade strengthening by knowledge (development of digital designs of products). At the global level – it can become a basis for the reconstruction of the whole world economy and ensure a strong, inclusive and fair recovery. Therefore, CE building will require an intensification of international cooperation in a number of sectors and revision of the policy related to assistance to the developing countries. The proposed ideas may serve as a basis for further academic studies and development of practical projects. In the future papers, it is expected to provide rationale for the concept of digital platform for CE.

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