

How to become an agent of sustainable development

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Abstract

Social problems are growing in complexity faster than human capacity to solve them. This is a systemic governance crisis, overarching all domains at the regional and global levels. The root of cause-effect interrelations leading to the governance crisis is *lack of agency of sustainable development* ("SD"). The intrinsic relations between agency, social institutions of education and science, and culture, are such that agency is at the root of all societal change. The key characteristic of agency is '*conceptual power*' – capability to create and implement a viable conception of social development. Effectiveness of SD agents depends on their alignment with six categories of universal laws and principles that condition sustainable life of humanity, which in the context of globalization is achievable by means of *collective agency*. Mechanisms by which cooperatives can realize themselves as effective SD agents are described, and the basic principles of an SD strategy are proposed.

1. System crisis and the need for effective agents of change

1.1. Introduction

It can hardly be a secret that the modern civilization has accumulated a great deal of problems. If the facts of the present day are soberly observed, they lay cause for a certain concern: crises, catastrophes, natural disasters, wars and conflicts, various anomalies seem to be steadily infiltrating the lives of people, leaving less and less hope for a thriving future. The chronology of such events over the last 100 years is partly illustrated in Appendix A. In terms of economic relations, it is precisely this situation that lays foundation for high-profile leaders like Pope Francis and IMF director Christine Lagarde to state that the global economy and financial system must experience a fundamental change (Fox, 2013; Lagarde, 2016).

As acknowledged by the *UN 2030 Agenda for Sustainable Development* (Sustainable Development Goals, henceforth - "SDGs-2030"), the seriousness of the situation is such that the very life of human civilization is at stake (UN, 2015: 14) - a signal that something rather significant is lacking proper control. This is precisely why Sustainable Development ("SD"), which has become the credo of the International Cooperative Movement and the International Cooperative Alliance (ICA, 2016), has widely entered, and continues to stay a priority subject on the international agenda, as the modern course of civilization lacks both development and sustainability.

Social problems – political, economic, ecological, etc. – exist in various countries with different socio-economic arrangements. Due to *globalization, understood as the integration of countries and peoples into a common culture* (which includes globalization of economic relations as its aspect), problems in some regions negatively affect other regions, which was clearly demonstrated by the 2008 financial crisis, and is clearly demonstrated by the current turmoil in the world economy and on the global political arena. On top of that, the uncontrolled approach of an ecological catastrophe is a clear sign that there is a global system crisis.

The fact is that the existing national, regional and global governance systems are not able to handle the ever-growing complexity of what they are trying to govern (states, regions, economic alliances, global processes, etc.). As D.Engelbart put it,

"The complexity and urgency of the problems faced by us, earth-bound humans, are increasing much faster than are our aggregate capabilities for understanding and coping with them." (Engelbart, 2004)

This was also acknowledged by the Council on Foreign Relations in the *2015 Report Card on Global Governance* (CFR, 2015), which is a clear indication of the current governance crisis.

Governance is understood as the ability to: a) identify a process and the problem/opportunity it carries; b) set a goal with respect to it; c) define a conception (strategy and tactical actions) of achieving the goals; d) implement the conception into life. Basing on this definition of governance, the most vivid example of lack of governance (i.e. a governance crisis) can be seen in the area of ecology, more specifically - in the area of ecological sustainability.

In 1972, when the well-known book *Limits to Growth* was published (Meadows et al., 1972), a serious and widespread reaction of politicians and the scientific community did not follow - the process of ecological degradation was not identified by the majority (Sandbach, 1978). Only 20 years later, the 1992 UN Conference on Sustainable Development held in Rio de Janeiro witnessed the first internationally accepted definition of the goals and strategy of SD (UN, 1992).

2000 saw the development and acceptance of the Millennium Development Goals, which were essentially a reiteration of the 1992 SDGs set in Rio (UN, 2006). Some 4 years later, the follow-up book *Limits to Growth: 30 year Update* noted that the state of things and the looming consequences only got worse since *Limits to Growth* first saw light (Meadows, Meadows, and Randers, 2004). In 2008, Graham Turner from the Australian CSIRO published the paper *A Comparison of 'The Limits to Growth' with Thirty Years of Reality*, where it was once again clearly shown that over the last 30+ years, despite the well-intending declarations, humanity continued in the 'business as usual' manner towards an ecological dead-end. In other words, none of the sustainable development goals set to date had been achieved to an extent that would noticeably change the situation (Turner, 2008). Ugo Bardi reached the same conclusion in his 2011 review of *Limits to Growth* (Bardi, 2011).

2015 saw many international events dedicated to SD, as well as another version of strategic SDGs, instilling hope for the future. However, considering the 40-year trend of almost total inaction, there has not been sufficient indication that governance has evolved so as to produce results this time around.

If there has been no success in taming the detrimental impact of humans on the biosphere, then there obviously exists a problem in either the SDGs themselves, or the governance process related to achieving them. Accepting that the goals are adequate and achievable, the problem is in implementing them - in implementing the sustainable development strategy, i.e. in the governance of this process.

In some circles, the governance crisis is equated with the crisis of the liberal-capitalist socio-economic model, and is termed 'crisis of capitalism' (Fraser, 2011). This is owing to the dominance of the liberal-capitalist model in many areas of the world, as well as the fact that liberal capitalism disregards sustainability that is not profitable. In other words, the goals of sustainable development simply do not exist in the paradigm of this socio-economic order. However, equating the governance crisis and the 'crisis of capitalism' is not entirely accurate, as the crisis of capitalism is simply one of the aspects of the global governance crisis.

As Émile de Girardin had aptly put it, "*Gouverner, c'est prévoir ; et ne rien prévoir, c'est courir à sa perte.*" ("To govern means to foresee; and to not foresee anything is to be on the road to ruin") (Girardin, 1852). For a process to be governed, it must be sufficiently predictable, meaning that there exists a model (or description) that is close enough to the process so as to predict its development in the future. If such a model is completely absent, inadequate, or incomplete, then it becomes impossible to foresee and, as a consequence, to govern such a process. This is why, in the context of the current governance crisis, it is reasonable to ask where today's decision makers – economists, politicians, executives – get their social, economic, political, ecological models.

First and foremost, they form their models on the basis of the education they received (BSc, MBA, J.D. etc.). These models are established by *educational standards, understood as the de-facto and de-jure acting list of subjects, as well as the requirements for content of subject-specific courses, the results of passing the courses, and methods of controlling the results*. The educational system of any culturally peculiar society functions in accordance with educational standards. Educational standards are created by corresponding scientific branches, as it was stated in Commitment 7 of the *2014 International Cooperative Summit Declaration* (Green and Leroux, 2014). Therefore, the crisis of governance stems from a crisis in *science – the social institution that develops description, models and conceptions of governing (managing and controlling) various processes in different areas of human activity*, inter alia descriptions and models of socio-economic processes.

1.2. Agency and the crisis of science

The crisis of science can be vividly demonstrated by looking at the sphere of economics. Throughout centuries, the brightest minds of humanity tried to work out the principles of economic relations, and as a result the world has seen many economic schools and movements, such as mercantilism, the school of Physiocrats, the classic political economy of Adam Smith, marxism, neoclassical economic theory, keynesianism, institutionalism, and monetarism. Figure 1 shows that over the course of time, the quantity of economic schools succeeding each other is constantly increasing. As a result, by the beginning of the 21st century, four of them are still developing. At the same time, despite the impressive growth of the quantity of economic platforms, the problem of creating a crisis-free and sustainable world economy remains unsolved.

The two fundamental postulates in the currently dominant liberal-capitalist ('neoclassical') economic paradigm are (1) the unpredictability of the market and its self-regulation, supposedly in the best interests of everyone (for which there has not been direct proof), and (2) the inherent value of economic growth (Weintraub, 2007). Considered in the context of sustainable development, these postulates render any discussion practically useless for the following reasons.

First, it is by definition impossible to govern something that is not *predictable to a sufficient extent*. Any governance implies goals with respect to the object being governed, as well as a plan (strategy) of achieving the goals. The market is a means of distributing goods, not an agent in economic relations, and is thus not capable of setting goals with respect to society, its way of life, the purpose of its existence, etc. At the same time, life of the society under the declarations of a 'free market', when in reality it is not free, leads to the concentration of governance in a narrow circle of economic agents - a few international groups and corporations - that remains unseen by the majority.

The existence of such dominant agents in the global economy was shown by the 2011 study *The Network of Global Corporate Control*, showing that 147 firms control 40% of global wealth (Vitali, Glattfelder, and Battison, 2011). The falseness of the 'free market' declaration was described in detail by John Kenneth Galbraith, former advisor of two US presidents, in his 1973 book *Economics and the Public Purpose*. Galbraith outlined two interacting subsystems within the economic system of the USA: the '**market system**' and the '**planning system**'. In the 'market system', companies truly function in conditions of competition, and it mostly consists of small businesses, predominantly family businesses, that have no perspective of ever becoming large (Galbraith, 1973). The 'planning system' is represented by large corporations, which control prices within their products' markets. Moreover, their distribution costs are based on the internal long-term planning and inter-, intra-industry agreements (for the most part an agreement implicit, unpublicised and thus judicially unpunishable) on prices, production volumes, etc., almost without any competition for the market or consumers. Their goal is an acceptable revenue over a long period of time, but not the satisfaction of social needs and the resolution of social problems (Galbraith, 1973).

The 'market system' serves the public belief in the myth of 'free market', concealing the 'planning system'. Galbraith calls the 'planning system' a '*socialism for General Motors and Lockheed*' (Galbraith, 1973), because they are, even after a complete failure of their techno-scientific policies, almost entirely covered from bankruptcy by their position on the market and their relations with the government. All of this makes them different from the firms Galbraith ascribed to the 'market system', which truly fight for their survival in a competitive environment

and where the social security of the staff and the entrepreneurs-owners is on an incomparably lower level than of those in the 'planning system' (Galbraith, 1973). The fact of existence of these two subsystems could be observed during the 2008 financial crisis, when the US government and Federal Reserve rescued players of the 'planning system' – large corporations and banks – with multi-billion dollar cash injections (Costa and Ponder, 2015).

Second, any household, any consumer or manufacturing cooperative bases its actions on the simple truth that its resources are limited. However, when one speaks of macro-economy within the dominant liberal-capitalist economic paradigm, economic growth is considered as something of inherently highest value, and the higher the growth rate - the better (Meadows, Meadows, and Randers, 2004). Perpetual growth assumes an unlimited supply of resources, which obviously conflicts with common sense and the objective reality: resources are limited. The UN 2030 Agenda for Sustainable Development, although constantly emphasizes the necessity for rational use of resources and sustainability, just as consistently declares economic growth as the main goal of economic activity (economic growth is mentioned 17 times throughout the document) (UN, 2015). With respect to the economy, *growth, understood as the quantitative increase of existing economic parameters* (GDP, GNP, etc.), and *development (defined below in section 2.1)*, are different concepts that do not always intersect. Growth cannot be an end in itself, as growth leads to depletion of resources, directly proportional to the rate of growth, and thus leads to an ecological dead end, as illustrated by the following. According to the International Energy Agency, in 2013 the total primary energy supply was met mainly due to oil, coal, and natural gas production, making up 81% altogether (see Figure 2). Nevertheless, the reserves of oil, gas, and coal are estimated to be exhausted within 38, 162, and 412 years respectively (Worldometers, 2016), which is to seriously be taken into consideration in both short-term and long-term perspectives.

The above illustrations are limited to the sphere of economics, however the context of the problem is much wider and touches on all areas of science – especially the humanities (Reid, 2013) – and human culture in general (Arponen, 2014).

Summarizing the chain of interrelations, it can be seen that:

- Governance, specific decisions on policy in different aspects of social management (economic, political, ecological, etc.), are made based on the worldview, values, and ethics of governing agents - public officials, managers, executives, etc. - as well as their ability to organize themselves into an efficient governing body with the capacity to generate consistent decisions.
- The worldview, values, ethics, and capacity for organization of governing agents are formed largely by the educational system.
- The educational system functions based on educational standards, which are established by science as a social institution.
- Science is a part of culture.
- Culture is conditioned by the conception of social development (the fundamental goals of society and strategy of their achievement).
- The conception of social development is determined by the agent of change, who is capable of developing and implementing this conception of social development into life, and is thus based upon certain values, moral and ethical principles, axioms and postulates in an agent's worldview. However, agents of change can be creating a culture without consciously realizing the conception of social development, which makes them less effective as agents.

Therefore, *the capability to create a viable and sustainable conception of social development as*

well as the capability to create culture are key characteristics of agency. These capabilities can be named as ‘**conceptual power**’ and ‘**cultural power**’. Conceptual power and cultural power realized by an institution (a collective Agent) basically represent separate branches of power, supreme to the legislative, executive, and judiciary power branches.

In summary, the root cause of global systemic crisis is the lack of agency. Everything begins and ends with the agent of change acting and making decisions in compliance with their conscious choice of values, moral and ethical principles, axioms and postulates, which in fact entirely corresponds with the well-known words of Mahatma Ghandi: “You must be the change you want to see in the world.” (Barnby, 1991)

2. Nurturing agency of sustainable development

2.1. Definition of sustainable development

The idea of sustainable development grew from the recognition that the current global development model is detrimental for both environment and humanity (Tladi, 2007). SD is generally understood as a new model of development which does not damage the environment, and thus facilitates the survival and perpetual existence of civilization. In other words, a model that provides for society’s security and sustainability. The widely accepted definition of sustainable development as ‘*development that meets the needs and aspirations of the present without compromising the ability of future generations to meet their own needs*’ (Butlin, 1989) provides a satisfactory understanding of sustainability, even though the nature of ‘needs’ is not clarified (Caldwell, 1994), while leaving the essence of development entirely ambiguous.

Development is a fundamental philosophical construct, like the constructs ‘ethics’, ‘justice’, ‘good’/‘bad’, and hence is typically understood intuitively, making it difficult to define. ‘*Development*’ may be understood as a *Universal process, synonymous with evolution, in which a system successively approaches fulfillment of its potential, transitioning from one state to another and obtaining new qualities*. One of the aspects of system development is an increase in efficiency of resource use, as well as change in the type of resources used from the surrounding environment. Within the context of this article, ‘development’ is applied to human civilization – human beings and their communities (societies). Communities may range in scale from two people to the global community, i.e. humanity as a whole.

The definition of ‘development of communities’ that was accepted by the United Nations Ad Hoc Group of Experts in Community Development (1963) is as follows:

“The process in which actions of people themselves unite with the actions of government with the goal of improving economic, social, and cultural quality of life of the community, integrate these communities into the common course of national life, and give them the opportunity to make maximum input towards national development. This group of processes includes two necessary elements: the participation of people themselves in events to increase the quality of life with maximum initiative on their end; and the provisioning of technical and other services, aimed at nurturing initiative, self-aid, mutual aid, and increase in effectiveness of their actions.” (UN, 1963)

Basing on this definition, the philosophical foundation of development of communities, which can be extrapolated up to the global community, lies in the **practical shift** by individuals from being objects of governance **to being agents in governance (i.e. obtaining the quality of agency), acting by their own choice and initiative**. Therefore, a shorter and more concise definition of development of communities can be:

The process in which individuals comprising communities shift from being objects of governance to being agents in governance (i.e. obtain the quality of agency), resulting in positive changes in the quality of life (in non-material and/or material aspects) of the community.

This definition has three fundamentally important implications:

1. The personal development of community members, manifesting in the realization of their cognitive and creative potential (intellectual, moral-ethical, and physical), which makes it possible for them to obtain *agency in governance* (i.e. the capacity to govern).
2. The quality of agency, scaled to a particular community, leads to a qualitatively new state of that community, which can be described as *collective agency* or *integrated agency*, where agents act as an integrated whole within the course of common goals (interests). **The progressive scaling of agency from individuals to communities to the global community characterizes the process of civilizational development.**
3. Development is always characterized by a change in the qualitative state of the community, but not necessarily in quantitative growth of its parameters (population, material well-being, etc.).

2.2. Agency of sustainable development

Based on the above and the characteristics of agency described in Section 1.2, *agency of sustainable development is understood as the capacity to develop, modify and act within a certain sustainable development conception (strategy)*. An agent of sustainable development (henceforth - 'agent') is an individual or organization that possesses this capacity.

As it was established in Section 1.2, the agent lies at the basis of all possible social changes in the course of sustainable development. It is precisely the agent who determines and implements the conception of social development, which conditions science, which in turn conditions education, and consequently - the worldview and values of future agents. Therefore, actual progress in the course of a certain SD strategy requires a substantial **increase in the number of effective agents, who have the capacity to assemble into a collective agent** that harmoniously acts within the course of the same SD strategy.

Turning to reality, a very simple observation can be made: the life of humanity is an aggregation of very concrete, specific social interactions between people, as well as people and the environment. The entirety of these interactions forms the mass statistics of intrasocial and biospheric-social interactions, and consequently, determines the overall result – the social reality as it exists now. The essence of these interactions is determined by the *ethic (models of behaviour, perception of and interaction with oneself, other people, and the environment)* characteristic to individuals. **Therefore, the root of a conception of sustainable development is the personal ethic of individuals – agents of sustainable development** (Cladwell, 1994), and it is precisely a certain ethic that makes it possible or impossible for agents to assemble into collective agents.

The scientific basis of an adequate sustainable development conception must describe *what makes an individual an agent of sustainable development*, i.e. it must answer the questions:

- What ethic is characteristic to an agent of sustainable development?
- What is the worldview foundation (value system, principles, postulates and axioms) of an agent of sustainable development?
- What skills and knowledge does an agent of sustainable development possess?

The ethic of an effective agent is that which acknowledges the *equality of human dignity of all, understood as the equality of all in their capacity to consciously implement their unique personal development potential* (UN, 2015: 50). This means that an agent of sustainable development denies any personal hierarchy (exceptionalism, i.e. 'I am better than you' attitude) and the dual standards it generates, while accepting organizational hierarchy (functional specification of roles within an organization) and objective differences that exist between different people. It is this ethic of equality that allows agents to assemble into collective agents.

The agent perceives Humanity as one indivisible whole. The core of his/her value system is the realization of the creative potential of humanity, which bases of the personal moral-ethical and physical development of each human is in harmony with nature. Technological progress is considered an asset to sustainable development if and only if it supplements personal and social development, in line with the *2014 International Cooperative Summit Declaration* (Green and Leroux, 2014).

The increasing complexity of problems humanity is faced with necessitates not just effective agents, but collective agents. Therefore an agent must be competent in organizational forms (development and construction of organizations) that, basing on the ethic outlined above, effectively integrate agents into a collective agent that has higher creative and thus problem-solving capacity.

Individuals become agents of sustainable development when their morality and ethics oblige them to accept a global responsibility – a responsibility for the Earth and Humanity – by their own initiative. If this obligation is realized, an individual inevitably realizes that to transfer from good intentions to actual results requires certain skills and knowledge; skills and knowledge that will allow to develop and implement a strategy of sustainable development.

The foundation of this strategy are certain universal laws and principles, which the agent of sustainable development should be sufficiently competent in.

2.3. Universal laws and principles underlying sustainable development

As it is stated in the UN SDGs-2030, the realization of the conception of sustainable development at the current historic moment implies:

1. Overcoming the global ecological crisis;
2. Limiting social conflict, both in national and international relations, to a safe minimum (UN, 2015).

Adding to (1), in the perspective of further development of civilization, it is essential to integrate it into the natural environment, including the integration of anthropogenic energy flows into the natural biospheric energy flows (Kovalchuk, 2015).

(1) is the necessary precondition for facilitating (2) (UN, 2015: 35), and (2) is necessary for the facilitation of stable regeneration of a *population possessing high statistical indicators of health and personal socio-cultural development*, which is necessary for the realization of (1) in the future. This way, intrasocial processes and processes of biospheric-social interaction cyclically condition the quality of one another.

Attempts to ignore the biospheric nature of the life of civilization leads to degradation of the biosphere to such an extent, when there may be no ecological niche for the *homo sapiens*. This is apart from the fact that degradation of the biosphere leads to biological and moral-

psychological degradation of people in the succession of generations, which creates risk of cultural collapse even if the biological regeneration of the species is maintained. Attempts to ignore the necessity to humanize intrasocial relations and overcome certain intrasocial antagonisms (e.g. “tolerance” taken to absurd extremes), lead to increase in political extremism (Lazaridis, Campani, and Benveniste, 2016), which possesses only destructive capacity, and mass social ignorance and irresponsibility due to cultural degradation, which can lead to the end of civilization via an armed conflict or technogenic catastrophe.

Precisely for this reason there is no alternative to the implementation of a sustainable development strategy. However, this task (as it was shown in Section 1) requires an adequate scientific and methodological basis – in the aspect of social psychology (the psyche is what drives people) and sociology (the objective laws which govern the life of society), as well as economics (a modern human being, nurtured by contemporary culture, is incapable of life in the environment without protection of the technosphere, which is regenerated and developed through economic activity).

All of the aforementioned, the life of human civilization in general, are governed by many universal laws and principles. They condition societal sustainability, and thus the effectiveness of a certain sustainable development strategy depends on how adequately these laws and principles are reflected in a given strategy (i.e. in algorithms of social and environmental governance, societal organization and economic activity which the strategy defines). Therefore, agents of sustainable development should seek for methodology, science and philosophy that are most adequate for investigation of the objective reality and understanding the universal laws and principles.

From the perspective of sustainability, these universal laws and principles can be organized into six groups:

- **The universal laws and principles of the biosphere and cosmos**, which regulate: **1) interaction** of the biosphere and cosmos, **2) formation** of ecosystems and **3) the interaction of biological species and ecosystems** and ecosystems with each other within the biosphere.
- **The universal biological (physiological and psychological) laws and principles**, which apply to our species and regulate the life of every individual, as well as intraspecific interactions between people, with the population and with the whole species.
- **The universal moral and ethical laws and principles**, which regulate the noosphere (Levit, 2000) and relationships between possessors of mind and will. This side of the objective reality is a very debatable subject among people with different worldviews. There is a rich diversity of views on these universal laws and principles: concept of sin and salvation in Christianity, concepts of predestination and day of resurrection in Islam, secular humanism, moral naturalism, concept of rectification in Kabbalah, concept of Karma in many schools of Asian religions, etc. These views constitute different subjective models of the *objective ethics*, which conditions the sustainability of society.
- **The universal sociocultural laws and principles**, which predetermine the impacts of cultures on life of populations that carry these cultures. Culture is, in the words of E.B. Tylor, *‘that complex whole which includes knowledge, belief, art, morals, law, custom and any other capabilities and habits acquired by man as a member of society.’* (Taylor, 1871). Culture is a sort of superstructure on the biological foundation of the *homo sapiens*. The main quality of culture is that it is an **object of human creativity** – hence the term *‘cultural creatives’* (Ray and Anderson, 2000) – and may be oriented towards different goals, different means and methods of attaining the goals. At the same time,

culture is one of the external factors that affects the population carrying it. If the effect of culture on the population is stable in the succession of generations, then the genetic mechanism of the species will adjust in one way or another. The variability of culture and its impact on genetics of the population leads to the question of the quality of the culture. In other words:

- a society may give rise to such a culture, which will guarantee the death of the population within several generations, leaving space for its geopolitical competitors;
 - the same society is capable of creating such a culture, which will facilitate the most complete realization of the personal development potential by all and the sustainable crisis-free development of society in the succession of generations, in harmony with nature.
- **The universal economic and financial laws and principles**, which predetermine the curve of development or degradation of socio-economic formations. The historically real culture of all contemporary societies is such that we must protect ourselves from the natural environment by an artificial living environment - the technosphere. The technosphere is regenerated and developed through economic activity, which is conditioned by all other groups of universal laws and principles. However, economic activity has its own specific laws and principles. If we turn to contemporary courses on economic theory, it will be seen that they, in the vast majority, implement the financial-accounting approach, in which the main task of economists is to count money and analyze its circulation, without considering the generation of demand for natural resources and products, the organization of production and marketing (basing on the postulate that "the market will regulate itself", as it was discussed in Section 1). This leads to an absence in holistic economic and social scales, limiting the main indicator of economic development to economic growth. The alternative to the financial-accounting approach is discussed in Appendix B - Basic Principles of the Conception of Sustainable Development.
 - **The universal laws and principles of governance, ruling and control**, which apply to all types of processes (whether it is a kid riding a tricycle or a complex multinational project involving several states), and thus predetermine effectiveness or defectiveness of governing bodies and agents in societies. Society is formed of a multitude of people and generates a multitude of individual and group interests. In this multitude there exist conflicting interests. The main contemporary problem is that society generates interests that are detrimental to itself, interests that conflict with sociocultural (including economic), ethical, and biological laws and principles that condition its sustainable and crisis-free development in the succession of generations in harmony with nature (see Appendix B). This leads to the necessity for managing the processes of conflict resolution and realization of a multitude of interests. There are multiple distinct systems and control theories, which define different methodologies of setting and solving problems, and thus have different effectiveness. Accordingly, a sustainable development strategy based on defective (entirely or in some aspects) systems and control theory will not be effective even if it was based on adequate socio-economic theories. Therefore, the given group of universal laws and principles also essentially conditions societal sustainability.

From our perspective, the basic course of sociology should give a clear understanding of all listed groups of universal laws and principles, which condition the life of every culturally peculiar society and of humanity as a whole. However, seeking the exposition of these laws and principles in sociological courses that correspond with the current educational standards is unpromising. Absence of such an educational course is a fundamental obstacle to nurturing

effective agents of sustainable development, independent of the particular social roles they fulfill.

Therefore, a sustainable development strategy must include a concrete scientific and methodological basis that covers all six categories of universal laws and principles. The basic principles of the sustainable development strategy that we believe aligns with these universal laws and principles, and can supplement the UN 2030 Sustainable Development Agenda, is described in detail in Appendix B.

3. Cooperatives as agents of sustainable development

The current governance crisis, manifesting as the growing complexity of social problems, whose growth rate outpaces that at which they are solved, results from crisis of science. The crisis of science was in turn caused by a lack of agency of sustainable development. Therefore, overcoming the governance crisis and making tangible steps towards sustainable development of humanity requires not only nurturing individual agents, but developing mechanisms of their assembly into collective agents of SD, with much higher creative and problem-solving capacity. Cooperatives potentially have the capacity to address this global challenge in the following ways:

1. Creating an environment to nurture agency of sustainable development;
2. Progressively scaling collective agency of sustainable development;
3. Making significant positive input into science and education.

3.1 Creating an environment to nurture agency of sustainable development

Cooperatives are, in accordance with the 7 cooperative principles, oriented first and foremost toward satisfying the natural (demographically defined) needs of their members, including education (cooperative schools), nutrition, housing, clothing (consumer, construction, and similar cooperatives), social services (credit and finance cooperatives, mutuals). Effective satisfaction of these needs means providing members with more free time for personal development and self-education. Time for personal development is essential to realize one's cognitive and creative potential and manifest it as agency in sustainable development. This is a significant alternative to the 'full occupancy of time' paradigm, where people are trapped in a vicious circle of earning and consumption.

The orientation of cooperatives toward satisfying the needs of its members allows to consider a cooperative as a sort-of micro-society – a scaled down version of society at large. A cooperative is a self-regulating, self-governing entity, and it is precisely self-regulation, i.e. policymaking and policy application, which makes cooperatives a scaled model of human society. Basing on the principle of democratic control, cooperatives, through the involvement of their members into governance processes and personnel rotation, can create an environment for practical, hands-on learning of how governance processes work, first and foremost through reflection on and postulation of the policies (rules) of cooperative functioning. It should be noted that without an awareness of the fundamental rules based on which the cooperative functions, as well as the capacity and competence to change them, the democratic principle remains only nominal, not practically implemented.

Thus a cooperative can become a self-conscious, initiatively-regulated organization, where members understand, reflect on, and participate in governance processes. It is precisely through this process that collective agency may be obtained at the cooperative level and scaled

further. Solving problems in our cooperatives, we will be learning social governance at a new level. Legislation in many countries allows for high initiative in internal self-regulation of cooperatives, which facilitates this process (e.g. the Russian law on consumer cooperatives) (Russian Federation, 1993).

Most importantly, cooperatives can internally nurture the ethics of equality of human dignity, which lies at the basis of the conception of sustainable development. The ideal process of development occurs through free and open dialogue, where all participants (without exception) conscientiously work toward identifying problems (i.e. those which contradict the universal laws and principles) and resolving them, not toward convincing other participants of the discussion in their rightness. Participation in cooperative governance allows to develop such a culture of free and open dialogue, establishing true collective agency.

3.2 Progressively scaling collective agency of sustainable development

Through the process described in section 3.1, cooperatives nurture agency of SD in individuals and the ethic that lays the foundation for assembling a collective agent. Assembling a collective agent means mastering forms of organization, i.e. means of organizing the efforts of multiple people.

Having successively implemented the principles of establishing collective agency within their organization, multiple cooperatives can apply the same principles and personnel to then integrate among themselves, thus scaling the collective agent with higher capacity for solving higher-level problems. This scaling may continue up to the global level, transcending national boundaries, where a cooperative can act as a collective agent of sustainable development that is capable of dealing with high-level problems.

3.3 Making significant input into science and education

Being microsocieties, cooperatives are faced with real social problems that can be seen at the scale of the society at large (first and foremost, problems relating to human interaction and effective organization). Reflecting on the approaches toward and experience with solving these problems, cooperatives may form the scientific basis for scaling these approaches to larger societies (the scale of national states and beyond). Performing their own small and large scientific research (depending on the size of the cooperative), cooperatives act as grassroots and higher-level scientific and research hubs. A higher impact on, and contribution toward, science may be done through joining efforts of various organizations and individuals studying cooperatives. This way, cooperatives may also form the scientific basis for their own educational standards (i.e. educational programs) as well as influence the educational standards of the region and state.

In some regions, government delegates the function of education to various organizations, including coops, and finances them proportionally to the quantity of students. This allows to implement new educational standards, within the government regulations. An example of such an arrangement are Charter Schools in Alberta, Canada, where the provincial government delegates the organization and running of schools directly to initiative groups, bypassing local district school boards (Alberta Government, 2002). The charter schools have higher autonomy than government-run public schools, allowing them to offer educational programs that are significantly different from regular public schools.

The declaration of the 2014 International Summit of Cooperatives stated the importance of creating holistic social scales of human activity in the context of sustainable development, as well as the creation of new organizational forms (Green and Leroux, 2014). Cooperatives can become the driver for search and implementation of organizational forms that allow people to effectively solve their problems, nurture and scale agency. This may position cooperatives as effective collective agents, comparable in scale and capacity to governments and transnational corporations. One of the manifestations of this trend towards new agency can be seen in the 2013 address of King Willem-Alexander, in which he marked the end of the “classical 20th century welfare state” and the emergence of a “participation society” where people take responsibility over their own future (Independent, 2013).

Thus, the potential of cooperators and cooperatives to become effective agents of sustainable development, to scale agency and contribute to sustainable development of civilization, is extremely high. Overcoming the existing crises and problems, cooperatives can be the driving force to make significant progress in the course of sustainable development, allowing for the realization by all of their unique cognitive and creative development potential, which is a warrant of the crisis-free evolution of Humanity in harmony with nature.

Tables and Figures

Figure 1 – Main Economic Schools, Currency Conferences and Crises (Wikipedia, 2016)

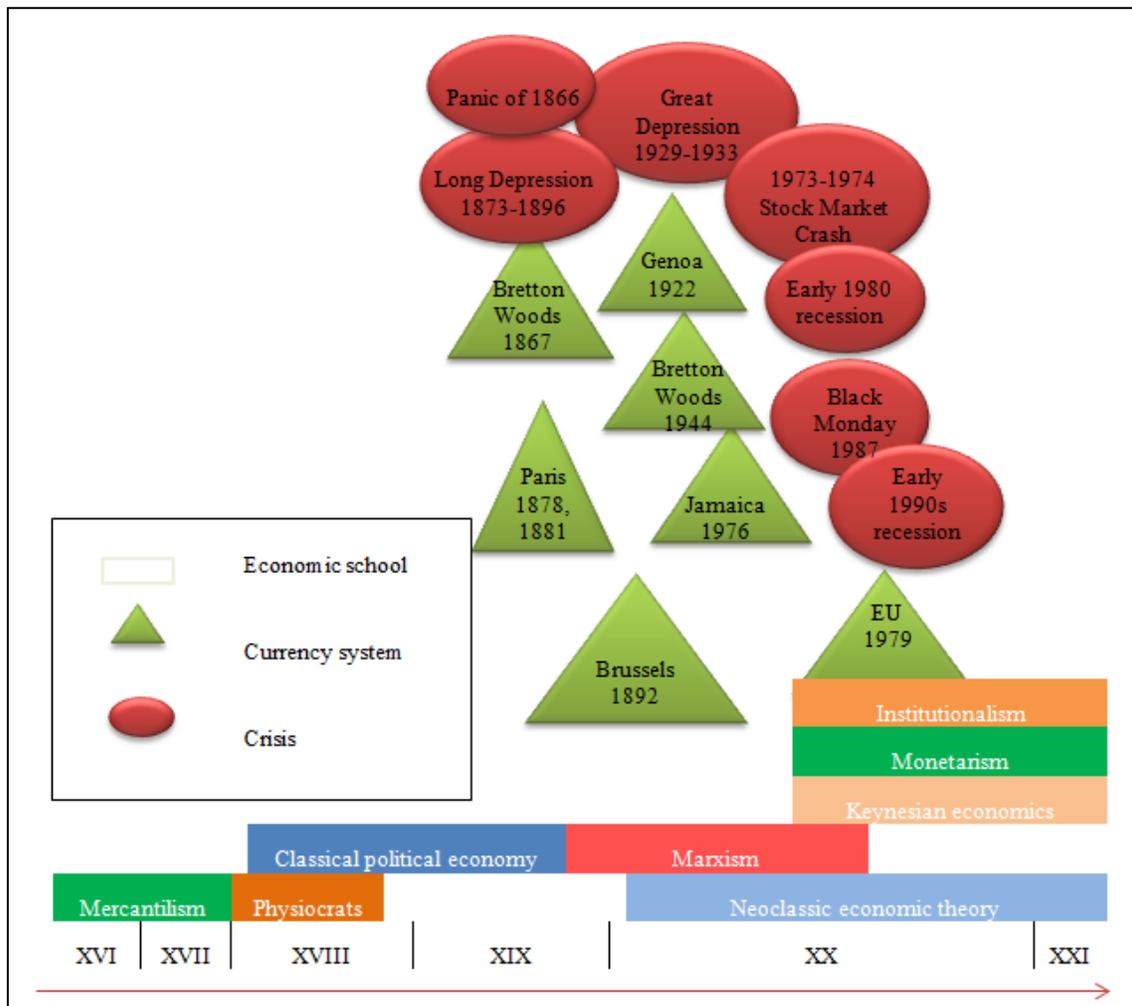


Figure 2 – Total Primary Energy Supply in 2013 (IEA, 2015)

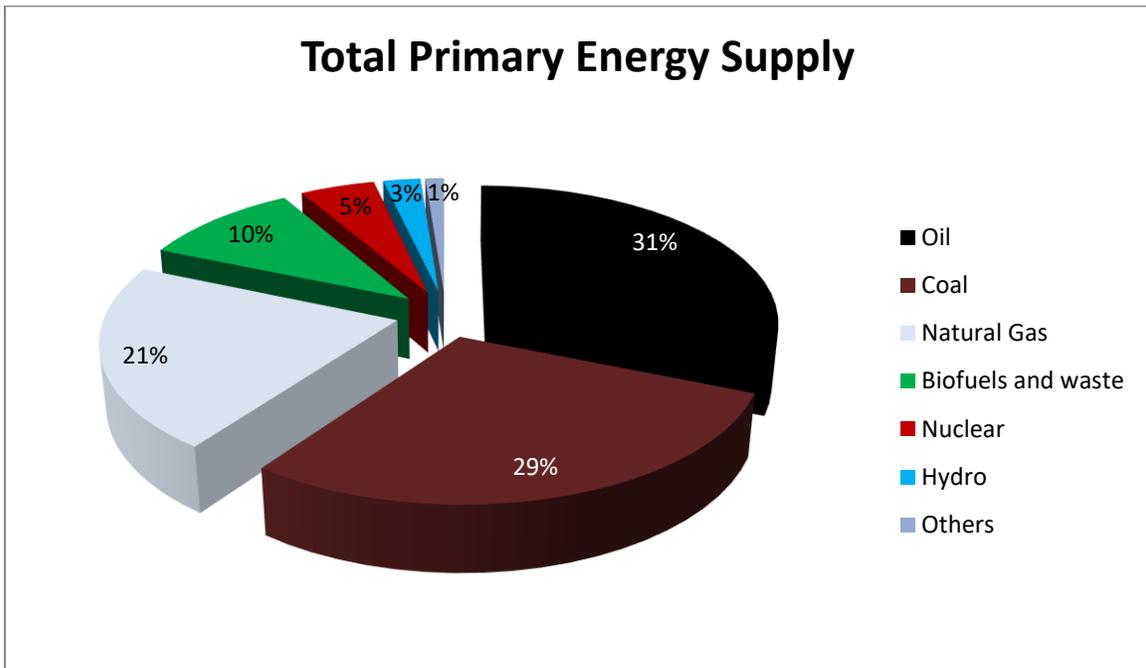
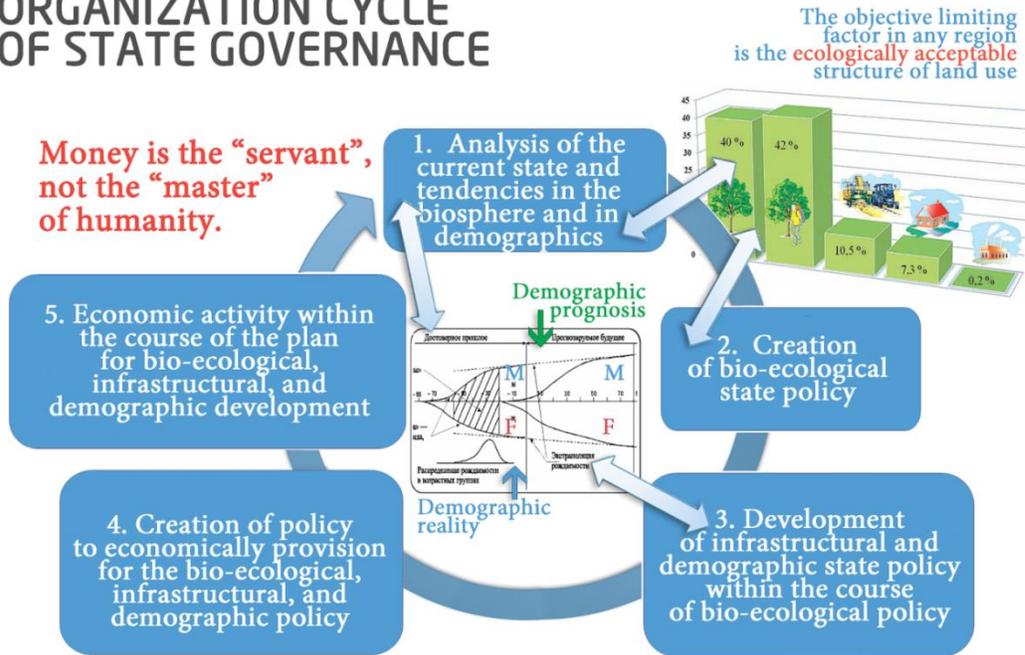


Figure 3 — Interdependence of Individual Control Tasks in the Realization of the Conception of Sustainable Development

MODEL OF THE OBJECTIVELY NECESSARY ORGANIZATION CYCLE OF STATE GOVERNANCE



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Appendix A – Major Disturbances and Disasters over the Last 100 Years

No	Time	Event	Effects
1	1914-1918	World War I of the 20 th century.	<ol style="list-style-type: none"> 1. <u>Threat to global security.</u> 2. Over 9 million soldiers and 7 million civilians died or were killed. 3. Millions more injured or disabled. 4. Fall of the Russian, German, Ottoman and Austro-Hungarian empires. 5. Economic downfall.
2	1939-1945	World War II of the 20 th century	<ol style="list-style-type: none"> 1. <u>Threat to global security.</u> 2. Nearly 75 million people died or were killed. 3. Lots of people injured and disabled. 4. Economic slump worldwide.
3	1941-1945	Holocaust	About 6 million victims.
4	1945	Bombing of Hiroshima and Nagasaki	<ol style="list-style-type: none"> 1. <u>Threat to global security.</u> 2. 129,000 people died. 3. After-effects of bombing on both people and environment.
5	1945-1990	Cold War	Political confrontation between the West and the USSR resulting in <u>peace threatening conflicts.</u>
6	1956	Suez Crisis	<ol style="list-style-type: none"> 1. <u>Threat to global security.</u> 2. Thousands of victims among combatants. 3. Political unrest.
7	1955-1975	Vietnam War	<ol style="list-style-type: none"> 1. <u>Threat to global security.</u> 2. Tens of thousands people dead or wounded.
8	1962	Cuban Missile Crisis (Caribbean Crisis)	<u>Threat to global security</u> characterized by possible escalation of the Cold War into a full-scale nuclear war.
9	1986	Chernobyl Disaster	<ol style="list-style-type: none"> 1. <u>Threat to global security</u> owing to release of radioactive substances over the USSR and Europe. 2. Human losses. 3. Economic losses due to contamination of vast territories. 4. Long term after-effects on both people and environment.
10	1991-2001	Yugoslav Wars	<ol style="list-style-type: none"> 1. <u>Threat to world peace.</u> 2. Over 140,000 people died. 3. About 4,000,000 people displaced. 4. Political turmoil.
11	2003 – till now	Military invasions of the USA / NATO forces in the Middle East	<ol style="list-style-type: none"> 1. <u>Threat to global security</u>, unrest in the Middle East, as well as widespread of the “Islamic State” terrorist organization. 2. Millions of victims. 3. Millions of refugees and mass migration.
12	2011	Fukushima Daiichi Nuclear Disaster	<ol style="list-style-type: none"> 1. <u>Threat to global security</u> owing to release of radioactive substances over Japan and the Global Ocean. 2. Human losses.

№	Time	Event	Effects
			3. Economic losses due to contamination of vast territories. 4. After-effects on both people and environment.
13	2014 – till now	War in Ukraine	1. <u>Threat to global security</u> due a possible direct conflict between Russia and the NATO forces. 2. Tens of thousands of human losses. 3. Millions of refugees and mass migration.

Source – Note: compiled on the basis of data from www.wikipedia.org

Appendix B – Basic Principles of the Conception of Sustainable Development

Principle	Description
<p>1. The main aim of the economy is the guaranteed satisfaction of essential human needs and social institutions in an environmentally-safe manner in the succession of generations.</p>	<p>This aim is implemented by economic approaches alternative to the existing ones.</p> <p>Some branches of the today's economy are primarily aimed at meeting needs, the satisfaction of which proves to be detrimental for individuals, future generations, and the biosphere, for which reason they may be called degradational needs. The satisfaction of degradational needs at the expense of vital and natural, demographically defined needs (education, food, housing, clothing, social services, free time and leisure activities), which can be predicted for decades and centuries to come since they depend on human genetics and demographic statistics. At the same time degradational needs are unpredictable: it is impossible to predict how many expensive cars, villas, yachts, jewelry or dope an individual will covet.</p> <p>Aiming national economies towards the satisfaction of natural human needs will, within a certain time frame, lead to the guaranteed sufficient supply of certain goods produced in line with the demographically defined needs spectrum, due to their long-term predictability.</p>
<p>2. The Conception of Sustainable Development based on the strategy of population settlement in accordance with the principles of landscape-estate urbanization</p>	<p>Modern Greek architect Constantinos Doxiadis has developed a conception of land use corresponding to the preservation of the biosphere and harmonious existence of human society within it (Figure 3, top right). This conception is completed by the algorithm of state control in the context of SD (Figure 3).</p>
<p>3. The organizational-and-technological approach applied instead of the financial-accounting approach</p>	<p>The economy is accounted on basis of natural (physical) units instead of financial ones, results in the alignment of stable technological chains integrated into the biosphere, not an endless pursuit of higher profits.</p> <p>Unlike the financial-accounting approach, the organizational-and-technological approach requires to know answers to the questions as follows:</p> <ul style="list-style-type: none"> ➤ How are needs generated within society? What are the consequences of their satisfaction? ➤ What to produce in conditions of limited resources and production powers, i.e. how are various products and industries prioritized? ➤ What should production volumes be? Which technologies should be applied within the manufacturing process? ➤ How should products and natural resources be distributed?

	<p>➤ How to ensure the ecological safety of the production-consumption system?</p> <p>Answers to these and many more questions are bound by the policy (both internal and foreign), implementation of which the economic system serves in one way or another</p>
<p>4. A practice balancing the use of planned and market economies</p>	<p>A plan is an aggregation of aims of the production system along with means and instruments of their achievement, while a market is only one of possible means enabling to reach desired goals. Governance over an aggregated system requires a correct combination of both directive as well as unstructured methods of regulation and self-regulation of the economic system.</p> <p>Therefore:</p> <ul style="list-style-type: none"> • The planning system implies an aggregation of aims of socio-economic development plus a governance conception leading to their implementation, where the conception governs a number of processes, including: 1) production of goods; 2) their distribution among consumers; 3) consumption; 4) utilization and recycling after consumption. • The market mechanism is one of the means of distributing natural resources and goods (both intermediate and finished) among consumers (including the recycling industry). Though the market can successfully fulfill this function, it is not able to neither set nor achieve goals of socio-economic development proclaimed by politicians. <p>The plans drawn up for different sectors of economy should be such that each sector would be able to definitely achieve them.</p> <p>Of course, the following question may arise: why is a plan required if it is knowingly achievable?</p> <p>If plans are too aggressive for a particular sector, the latter will either try to 'jump over its head', resulting in fake accounting and reporting, or collapse by working at the limit, as it could have been observed several times in the USSR.</p> <p>The plan should establish a benchmark below which production should not fall. All that the sector has produced in excess of the benchmark will create a stability margin for the sector — goods that will be redistributed by the market.</p>
<p>5. Use of metrologically consistent balance models of</p>	<p>In particular, use of input-output models with the view of pulling together development plans of all industries.</p>

product and financial exchange within the national economy.

Since the conferences in Paris, Genoa, Bretton Woods, and Jamaica were held, the global monetary system has not significantly altered (see Picture 1.1), which was mainly due to the lack of the de-facto invariant in economic relations – the basic concept making economic theories metrologically consistent.

An invariant is a good participating in product exchange process and expressing the prices of all other goods.

Throughout the history, grain was used as a real invariant in some parts of the world; later, precious metals (gold, silver, platinum) were used. One of the features of contemporary civilization is that the majority of manufacturing processes are based on energy consumption. No matter whether industrialized giants with the service sector in the core or developing countries showing insignificant GDP growth, the kilowatt-hour of electricity forms the basis of production everywhere and, thus, is the contemporary price-list invariant. Let us see what it means for economic relations.

Based on the formula for system efficiency, useful energy output can be calculated on basis of the following equation:

$$\text{Useful Energy} = \text{Efficiency} \times \text{Energy Supplied}$$

For any economy it means that the annual GDP is, on one hand, based on the efficiency of technologies and manufacturing process management, and, on the other hand, based on the distribution of energy over economic sectors.

In terms of the financial system of a state, energy standard of currency ensures interdependence between input energy characterizing economic as well as manufacturing potential of the country and its money supply, which, as a result, secures that the currency is backed by real goods and services.

With regard to the world's financial system, it is reasonable to introduce energy backing of currency at the global level, especially when taking into account the integration of national economies in the context of necessity of global trade and international settlements.

We consider four possible scenarios of global trade:

1. Currency of a state or a group of states serves as a hard currency. Such a state gains seigniorage

	<p>earnings from issue of banknotes. It is possible because its currency is backed by resources of other states. The value of other currencies can be set as a result of a mutual agreement or through operations carried out on speculative markets and can significantly differ from energy standard.</p> <ol style="list-style-type: none"> 2. A group of states create a common currency entirely replacing their national currencies. This requires a mutual agreement made between them on supranational governance of its circulation, which includes the introduction of supranational taxes, transfer payments and subsidies as well as the implementation of both supranational policy and transregional economic principles. For the member states it means to deliver its economic and political sovereignty over to their common transregional center as it happened in the former USSR or turns out in the today's EU. 3. All the world's countries create a fund (or a consortium) making contributions thereto in the form of their monetary stock based on energy standard. States willing to enter a particular market can buy any energy-backed currency they need in accordance with currency exchange rates. Energy standard applied in mutual operations shall be timely agreed by the states. 4. Energy-backed currency existing within a group of member states.
<p>6. Policy of planned price lowering instead of policy of planned price increase, and strict control of the prices of goods making up the basis of the pricelist.</p>	<p>The basis of the pricelist is a set of goods directly affecting prices of other goods. The basis of the pricelist includes, inter alia, energy resources, raw materials, and means of production. The key property of these goods is that a noticeable increase of their prices creates a noticeable increase in production costs of the vast majority of other goods within a short time period.</p> <p>The reason lies entirely with direct or indirect use of such goods while manufacturing some other (if not all of the vast majority of them).</p> <p>There are two ways of distributing results of economic development in a society:</p> <ul style="list-style-type: none"> ➤ First, the disproportion between output (grown due to increase in labor efficiency and application of new technologies) and money supply is equalized by printing of money, making the rich — richer, and the poor — poorer, since those who possess financial tools will take most of additional mass of goods. ➤ Second, the disproportion is eliminated by a planned reduction of prices of mass consumer

	<p>goods, which will not make the wealthy – poorer, but will definitely make the poor a little wealthier, reducing the social gap.</p>
<p>7. Control the emission of currency based on the energy provisioning standard in a three-contour economy.</p>	<p>Governments should be able to print as much currency as necessary for balanced performance of their economy.</p> <p>Governments should organize the following contours of money flows: 1) cash used by end-consumers (represented by all social groups); 2) non-cash transactions between entities acting within the state; 3) foreign funds transfer. By doing so, foreign trade may be conducted only through the state ensuring the conversion of domestic currency to foreign means of payment issued by an international bank-issuer in compliance with energy standard).</p>
<p>8. Ban on interest rate</p>	<p>Interest-free lending instead of usury. A share of company profits for banks-investors providing interest-free loans.</p> <p>Every entrepreneur adds towards the cost of their goods not only a portion of the loan taken to start their manufacturing process, but more importantly a portion of interest. Thus interest rate is one of the systemic causes of inflation.</p> <p>Additionally, interest-based lending makes representatives of the banking system irresponsible in relation to society: high risks result in an increase of rates, which in turn increases the cost of the product for consumers, slows down and makes the process of integrating innovative technologies more difficult. But investment in such technologies is high-risk a priori.</p> <p>The solution to the problem is a ban on interest-based lending with introduction of a fixed payment for loan service. In this case risks are reduced by the bank receiving a share of the credited enterprise’s profits. This, in turn, requires the bank to have a forecast-and-analysis center capable of reliably predicting returns on capital investment from any firm.</p>
<p>9. Ban on generation of artificial demand for essential goods.</p>	<p>A ban on irrational use of resources through stimulation of omnifarious ‘fashions’, marketing manipulations, and planned obsolescence.</p> <p>Limited resources necessitate rational use thereof, which requires a technological ‘long-lasting items’ policy aimed at creating products with a greater service life, simple recycling and utilization, modularity (i.e. replaceability of separate parts of an item) and a unified system of standards allowing the use of an item in many ways and an easy transfer from one technology generation to the next. Such a policy also requires to impose a ban on</p>

	<p>manipulative marketing technologies, when needs are artificially created, and people are motivated to satisfy them.</p>
<p>10. Ban on creation of markets of goods with fictitious value</p>	<p>Today, by different accounts, the so-called speculative sector of the economy has ‘value’ of up to 500 trillion (!) dollars, and only 50 trillion dollars are covered by real goods. Stock markets, securities, shares, as instruments of speculation, should be abandoned in the historic past, as they interfere with macroeconomic management based on input-output models.</p> <p>This refers to the whole speculative sector of the economy (including markets of gold, diamonds and other ‘valuables’), as well as markets of antiques and artworks (especially ‘abstract’ art, value of which is created by arts experts and propaganda) and ‘securities’ (including various kinds of debentures).</p> <p>Sale of securities should be banned over a 2-3-year period after their purchase, making speculation impossible or hard to accomplish.</p>
<p>11. Use of the taxation and subsidization mechanism as an instrument of unstructured configuration of the macroeconomic system vis-à-vis the goals of the state policy outlined in the development plan</p>	<p>There should be a progressive tax scale, and the tax base should be formed of legal entities only, which will simplify regulation as well as accounting and will decrease the amount of people working in revenue agencies.</p> <p>Grants and subsidies are necessary tools to develop strategically important industries, and a means of support for those industries, which have been affected by natural disasters or managerial unprofessionalism. The distribution of grants is based on specific indicators of input-output models, excluding the situations when there is too much or too little money.</p> <p>Introduction of innovative technologies at the initial stages requires unconditional subsidies at least at the level of infrastructural support of such projects and at most throughout the implementation process and, even more, until reaching scheduled production volumes.</p> <p>If education, healthcare and social services are left to suffice themselves in an uncontrolled market, then their content will always be determined, on the one hand, by market conditions which do not always correspond to the plans of social development; and, on the other hand, by organizations paying for the educational service. This means giving away the sphere of nurture and protection of an individual to those who pay the highest price, i.e. putting people at the mercy of private businesses, which are mostly aimed at cultivating ‘consumers’ instead of responsible citizens.</p>

<p>12. Provisioning of massive implementation of scientific innovation cycles in their entirety in all sectors of economy and other sectors of social activities within a reasonable time frame</p>	<p>A scientific innovation cycle consists of the following stages:</p> <p><i>fundamental scientific development → new technology engineering → mass-production.</i></p> <p>The main factor ensuring normal operation of a scientific innovation cycle are people, i.e. qualified personnel.</p> <p>This means that the cycle should start in grade school, establishing a holistic view of the economy as an integrated system, within which students will work in the future.</p> <p>Moreover, it is necessary to give the most complete possible picture of industry interactions, dependencies of normal workflow of industries on each other, strict dependencies of progressive social development on the correct balance of industrial chains.</p> <p>Exactly that kind of familiarity with the possible future profession links science, technological development and manufacturing with preparation of personnel, who are capable of carrying out the whole scientific innovation cycle in its entirety.</p>
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