Green economy as a condition for sustainable development of the Baikal region

V A Babikov, Ch B Urbanova and O K Maladaeva
Banzarov Buryat State University, Ulan-Ude, 670000 Russia

E-mail: mien-bsu@mail.ru

Abstract. The article analyses the development of a new conceptual direction of sustainable development for our country and the Republic of Buryatia, namely, “green economy” based on the rational use of natural and secondary resources, through low carbon development, recycling and reuse of waste and municipal solid waste, as well as unification of the regulatory framework in the relevant areas of economy and production. The authors identified the so-called “markers” activating and hindering the development of green economy in Baikal region, compared them with the most favourable regions for living and also with neighbouring regions in order to provide a rationale for the most promising areas of green economy for our region, which are: digitalization of the economy and public life in general, genetic engineering and various biotechnology, creating new equipment and materials (nanotechnology), various areas of tourism and recreation. As a result, it was concluded that: “green economy”, should become an important element of the concept of sustainable development of the Baikal region, it is this concept of development of the region highly coincides with the global trend of sustainable “green” low-carbon development and transformation.

1. Introduction
Over the decades, the Baikal region has developed a predominantly resource-based nature management system with extremely high technogenic loads on the surrounding natural and anthropogenic space. In recent decades the environmental problems related primarily to pollution of various environments: water, air, soil, as well as a decrease in the numbers of many plant and animal species, have worsened. The area around Lake Baikal has not been spared (mass uncontrolled tourism, unauthorized rubbish dumps, outdated technologies in the treatment of industrial and municipal wastewater). All this made it necessary to find ways of solving the environmental crisis in the Baikal region, which has the status of a transboundary one.

In our opinion, the concept of sustainable use of natural resources should be based on the green economy, which is understood as the sphere of human activity, which contributes to improving the welfare and quality of life of people, reducing social conflicts and inequalities in society [1].

In a broad sense, green economy implies the formation of a culture of respect for resources, low-carbon development, recycling and reuse, environmental protection, harmony between mankind and nature, as well as a unified legal and regulatory environment in the relevant spheres of the economy [2]. In a narrow sense, green economy is the protection and conservation of nature, in particular the elimination of the consequences of anthropogenic pollution, and the increase in
production capacity. It will create favourable conditions for the development of modern production and improving the quality of life [3, 4]. The Baikal region stands out as a region with unique features and sufficiently high potential for the development of a green economy. For this purpose, it is necessary to work out a strategy for its future development, to systematize theoretical and practical ideas about the further development of local industries and economic spheres, in the conditions of growing ecologically oriented production.

2. Models and Methods

The methods used by the authors to analyse the state of green economy development in the Baikal region were: cartographic, geo-ecological, comparative methods of system approach, statistical, analytical, empirical methods of inductive and deductive approaches. In addition to the above methods, the paper attempted to study the so-called “markers” stimulating and hindering the development of green economy. The integral index of aggregate tourism potential was calculated for the regions traditionally considered attractive for tourist and recreational activities (Moscow Oblast and Krasnodar Krai) in comparison with the Baikal region (which includes Irkutsk Oblast and the Republic of Buryatia). The main materials for the preparation of the article were the publications of experts working in the field of studying the concept of sustainable development and its impact on socio-economic development of different countries and regions of the world (on the example of Russia, Mongolia, China, Kazakhstan).

Table 1. Comparative characteristics of the “markers that inhibit the development” of the green economy in the Baikal region.

| Baikal region | Average air temperature |
|---------------|------------------------|
|               | Average annual temperature, °C |
|               | −1.8 | −1.5 | 5.9 | 14.1 |
|               | Average daily temperature range |
|               | 22.0 | 18.0 | 11-13 | 17.5 |
|               | Average long-term duration of the growing season |
|               | 139 days | 91-154 days | 164 days |
|               | one crop in a risky farming zone | one crop with the highest return |
|               | Average annual sunshine, hrs |
|               | 1,800-2,600 | 2,000-2,300 | 1732 | 2253 |
|               | Population density (data for 2011, 2015, 2020) |
|               | 3.13/3.11/3.1 | 2.8/2.8/2.8 | 158.8/162.9/169 | 69.3/71.59/73.8 |
|               | Life expectancy |
|               | 67.37 | 66.8 | 72.26 | 72.53 |
3. Results and Discussion

In order to analyse the current situation in the region, the features and characteristics of the formation of a green economy in the Baikal region it is necessary to analyse the main “markers inhibiting development”. Among them are the following: climatic conditions, the duration of the vegetative period, intensity and duration of sunshine, population density, average and maximum life expectancy. For this purpose, a comparative table was compiled, which included the data on the regions of the Russian Federation, including Irkutsk region and the Republic of Buryatia, included in the Baikal region (Table 1) [5-7].

| Ethnic composition (in%) |
|--------------------------|
| Irkutsk Oblast | Buryatia | Moscow Oblast | Krasnodar Krai |
| Russians | 88.2% | Russians | 69% | Russians | 91% | Russians | 86.7% |
| Buryats | 3.2% | Buryats | 29.6% | Ukrainians | 2.23% | Armenians | 5.37% |
| Ukrainians | 1.2% | Ukrainians | 0.582% | Tatars | 0.8% | Ukrainians | 2.58% |
| Tatars | 0.9% | Tatars | 0.7% | Evenki | 0.31% |

| Confessional composition |
|---------------------------|
| Irkutsk Oblast | Buryatia | Moscow Oblast | Krasnodar Krai |
| Orthodoxy, shamanism, Judaism, Catholicism, Islam | Orthodoxy, Old Orthodoxy (Old Believers), Buddhism, Shamanism, Islam | Orthodoxy, Catholicism, Islam | Orthodoxy, Catholicism, Islam |

| Integral index of total tourism potential |
|-----------------------------------------|
| Irkutsk Oblast | Buryatia | Moscow Oblast | Krasnodar Krai |
| 40.3% | 42% | 73.5% | 79.2% |

* The integrative index of tourism potential is determined by the following indicators: the sum of attractions + a variety of types of transport, accommodation, food, leisure and entertainment centres, handicrafts, souvenirs, shopping, festivals and tours, events.

The national and confessional composition of the Baikal region’s population, and the integral index of aggregate tourism potential should be highlighted as conditions conducive to the development of green economy (Table 2).

Green economy is a new trend in the development of entire regions and countries, in this regard, the development of this trend among the neighbours of the Baikal region, namely in Mongolia and the People’s Republic of China, is of particular interest because they are similar not only in natural and climatic conditions, but in ethnic, religious terms and similar branches of specialization of their farms. In Mongolia, both traditional types of natural resource use (nomadic and distant-pasture animal husbandry) are preserved, as well as fruits and berries growing, new for this country, based on technologies of new agricultural technologies. Not far from the capital city of Ulaanbaatar, there is an enterprise where strawberries are grown on the basis of drip irrigation in almost arid conditions. At mining and processing plants where polymetals and gold are extracted, environmental mining technologies are used and reclamation works are carried out. The enterprises for processing wool (sheep, camels, yaks) of the Gobi Company, known for their products outside the Asian region thanks to well-thought-out advertising and marketing of promoting their products to world markets are of special interest to the residents of our region [8, 9].
The People’s Republic of China is developing the One Belt – One Road initiative, which is an important strategic measure to expand foreign trade. The basis of this initiative is interconnectedness and mutual exchange, which are unthinkable without two important components – uninterrupted trade and the spiritual rapprochement of peoples. Streams, i.e. the sale of goods on digital cross-border e-commerce platforms (AliExpress, Alibaba and others) carry both of these components. They allow products from even more countries to enter the Chinese market. Some trading companies and individual entrepreneurs of the Irkutsk Oblast and the Republic of Buryatia did not fail to take advantage of this [10-12].

4. Conclusion

In the course of the analysis it can be stated that within the Baikal region there are both conditions for the development of green economy and the factors restraining it. The region has all the prerequisites for the development of eco- and science-intensive technologies and industries. The most promising of them include: digitalization of the economy and public life, genetic engineering, biotechnology, creation of new equipment and materials (nanotechnology); priority in the development of specialized types of tourism: ecological, event, gastronomic, ethno-cultural and agrarian [13, 14]. Thus, the green economy should become an important element of the concept of sustainable development of the Baikal region. The region’s development strategy is highly consistent with the global trend of sustainable green low-carbon development and transformation. Our country must go through a long process, choosing between environmental protection and a dynamic economy, and in the future a sustainable relationship between economy and ecology [6].

References

[1] Aktamov I G 2015 The role of pedagogical science in ensuring sustainable development The concept of sustainable education in the field in teacher training (Ulaanbaatar: Mongolian University of Education Press) 80-9
[2] Balchindorzhiev O B 2015 Modernization of Chinese society: socio-philosophical analysis (Ulan-Ude: Buryat State University) p 43
[3] Path of “green development” 2018 China 10 80
[4] Xie Zhenshua Green Development Road October 2018 China 10 24-5
[5] Atlas of Transbaikalia Buryat ASSR and Chita region 1967 ed V B Sochava (Irkutsk: GUGK) p 167
[6] Atlas Irkutsk Region: Environmental Conditions for Development 2004 ed A R Batueva, A V Belova and B A Bogoyavlensky (Moscow: Roskartografiya) p 90
[7] Baikal Atlas 1993 ed G I Galaziya (Moscow: Roskartografiya) p 160
[8] Erdenetuya U 2014 Approaches towards environmental conservation of the Mongols (Ulaanbaatar) from 228
[9] Xie Xinyuan 2018 Combating White Pollution China 10 34-5
[10] Concept of sustainable development in the field of teacher training 2015 ed A Amarzhargal (Ulaanbaatar: Publishing House of the Mongolian University of Education) p 502
[11] Zhao Lei 2020 Important Engine of the Beltway Economy China 11 38-9
[12] Shaimergenova G 2018 Synergy of joint efforts China 10 46-7
[13] Ulzetueva I D, Gomboev B O and Zhamyanov D Ts-D 2017 Investigation of the spatio-temporal distribution of pollutants in the surface waters of the Baikal natural territory in order to formulate a policy of conservation of Lake Baikal Proc.17th Int. Multidisciplinary GeoConference 243-50
[14] Ulzetueva I D, Gomboev B O and Zhamyanov D Ts-D 2017 The assessment of the anthropogenic impact degree on the catchment area of the Selenga river transboundary basin (Russian part) Proc.17th Int. M&D GeoConference pp 649-54