

Research Journal of Pharmaceutical, Biological and Chemical Sciences

The Industrial Nature Management and Process of Deforestation of the Territories of Kazan Province in XIX – Early XX Century.

Adrey Vladislavovich Vinogradov*.

Yelabuga Institute of Kazan (Privolzh'ye) Federal University, 89, Kazanskaya Street, Yelabuga, the Republic of Tatarstan.

ABSTRACT

Extensive use of forest resources and their export to different regions of the Russian state already in XVIII century became one of the major areas of development of the Kazan land. Formation of new enterprises of large-scale factory-and-works industry and urbanization processes, taken place in Kazan province in XIX century, considerably increased the need in forest resources that caused the intensive deforestation of the region. The forests were more actively cut down in uyezds situated along the banks of major river arteries, the Volga and the Kama (Laishevsky, Tetyushsky and others). Severe contraction of the forest lands, the scales of which are uncovered in the article, aroused a series of negative consequences of ecological character. On the deforested territories hydrosphere was considerably impoverished, the number of natural reservoirs was decreased, biological diversity was reduced, climatic variations became more pronounced. The listed ecological problems were one of the premises of failure of crops and famine in the years 1891-1892. One of the key causes of deforestation was an extensive system of land use, at that the growth of productivity reached, almost purely, by means of expansion of ploughed field. Shortage of natural resources of the end of XIX century furthered the change of the extensive to intensive forms of management.

Keywords: the history of ecology, nature resource management, the history of forest, deforestation, Kazan guberniya.

**Corresponding author*

INTRODUCTION

The nature resource management - the use of resources of natural environment for satisfaction of economic needs of society – is the main factor causing the ecological condition of industrially developed territories. Extraconsumption of scarce resources of nature can lead to ecological disasters of different scale: from contraction of geographical landscapes to impoverishment of biological diversity and irreversible climatic changes.

In XIX – early XX centuries the problem of overconsumption of the resources of natural environment was of special topicality. In that period there had been no harmonious exploitation awareness yet and the principles of reasonable nature management had not been worked out, that would allow to use renewable resources with consideration for their ability to be regenerated, to restrict withdrawal of non-renewable resources proceeding from the interests of ecology. At the same time, constant use of a natural resource had an impact on the whole ecological system of either region, resulted in upset of existing balance and chain reaction affecting many biological species that inhabited in the region and, in the end, exerting back influence on human.

The resource the most used in the age of the industrial revolution was forest serving as fuel, building material, raw material for domestic chemical industry. Extra use of forest led to deforestation of immense territories – turning the lands forested before into the grounds without forest cover (fields, waste ground, towns). Over long time the Kazan guberniya, being one of the most economically developed guberniyas of Privolzhye, took the leading position on deforestation.

INDUSTRIAL FACTORS OF DEFORESTATION

Before reclaiming lands of Nizhnekamsk by man, this region had more pronounced division into two landscape areas: south taiga, consisting of dark coniferous, broad-leaved and pine forests and forest steppe. Along the rivers Volga and Kama the taiga forests being situated on their north bank were separated from forest-steppe by the zone of oak-grove. The dense forest cover took up almost all extent of the region, including high-water beds, afterwards it was supplanted by grassland vegetation [1].

XIX century became a period of change in the history of forest management in Kazan guberniya. That time the need in wood reached such the height that the principles of efficient use of natural resources became practically unattainable. Industrial growth required colossal volumes of fuel and building materials: it was built new workshops, it was increased production at enterprises.

It should be noted that, the enterprises of timber industry were not the main «culprits» of deforestation – extents of forest cut down by them were compatible with the needs of customers. The level of demand for forest products was mostly depended on the needs of large-scale industrial enterprises. Thus, for example, much wood as fuel was demanded for production process at stearin- soap factory of the brothers Krestovnikovs: there for long time it was necessary to boil animal fat, trying to obtain its decomposition into olein and stearin. Without amounts of fuel wood functioning of the workshop on calcination would be impossible.

Huge mass of wood was processed by wood-chemical enterprises that produced ashes, potash, shadrik, resin and series of other products. Ashes and potash were bought up by many tanneries of Kazan guberniya, where they were used for liming and tanning fell. At that, for production of 1 kg of potash it was required more than 2 cubic metres of wood. Potash, in its turn, was much worse in respect of efficiency than mineral reagents, and for obtaining the wanted effect manufacturers needed large volume of potash (for example, for tanning fell 1 pood of caustic soda substituted for 18 poods of this product).

DYNAMICS AND SCALES OF REDUCTION OF WOODLANDS

Hence, the industrial development increased the deforestation exponentially: the more the production of soap and tanning factory increased, the higher the run on the wood-chemical was, the more forest lands were cut down.

As one can see, with the development of capitalist relations the guberniya became not only one of the principal supplier of wood to the other regions of the empire, but its heavy user, as the result, in the first half of century every year the forest lands reduced on average to 26 000 hectares (830 697 dessiatina for 35 years) [2]. More faster the forests were cut down in the most populated uyezds (in Kazan in the period from 1822 to 1857 it was cut down 56% of all existing forests) and in the most wooded, located along the banks of big rivers – Laishevo, Mamadysh (there for the same time it was cut down over 30% of the forest) [2].

In the middle of XIX century it became pronounced the deficiency not only in ship and building wood, but also firewood in some uyezds. According to M. Laptev, «shortage of forest ... hits you here in the eye, when you look at thin and crooked logs, major part of them are aspen logs from which the peasant houses are built» [2]. The situation compelled the poorest sectors of society to break the law stealing private and state wood to keep themselves warm during the big freeze in winter. Quite often using pieces of woodland, even of the big size, came to competition who was the first to cut them down - legal owner or local community. So, for example, the Entering forests, that occupied more than 5 000 hectares: in 1854 it was in ownership of Kazan, and already in 1871, after unsuccessful efforts to conserve the forest from illegal cutting, the forest and the protected oak grove covering 642 hectares were roused for haymowing and other management. In 1886 P. Golubev pointed to extremely rapid speed of deforestation of the Kazan guberniya and noted that «private landowners and peasants sometimes competed in extermination of forests in the most improvident way. In the uyezds of Tsarevokokshaisk and Koz'modem'yansk the pieces of woodland had recently been bought only to strip them for a year or two and then at all to leave them» [3].

Relatively small role in deforestation was played by natural causes, such as forest fires. One occurred in 1891 in the Tsarevokokshaisk uyezd and spread during a week from the 10th to the 17th of July. As a result, according to the correspondent of the newspaper «The Volga Reporter», the wood had perished to the sum of 6 654 rubles: 460 cubic sazhen of building wood, more than a thousand of cubic sazhen of pine, fir, birch and aspen woods [4].

It is demonstrative, that the perished wood was amounted by contemporaries not to measures of area but cubic sazhen of the lost wood and its commercial value. It was utilitarian mentality of the epoch, characteristic, in D. Scott's judgment, for all capitalist world: «Forest as a habitat disappears and is substituted for the wood as economic resource that should be used in effective and profitable way. Here the fiscal and commercial logics are coincided: they both are definitely taken up with the sum below the total line» [5].

The forest, however, was much more complex system and, at the same time, the structural element of the environment. Extensive cutting-downs and forest fires considerably reduced the biodiversity of the region thereby doing much damage not only to ecology but to traditional economy.

ECOLOGICAL AND ECONOMIC CONSEQUENCES OF CUTTING DOWN OF THE FORESTS

In 1856 the Ministry of Internal Affairs of the Russian empire drew attention to «reduction of the game» in the European part of the state and sent to the governor of Kazan the inquiry about the state of hunting in Kazan guberniya. The materials collected by the office of the governor allow to judge about changes in the fauna of the territory conditioned by extermination of the forests not to lesser (but except to more) extent than excessive hunting.

As the contemporaries noticed that the ecological situation in the region began to considerably change for the last 50-60 years – since early XIX century. According to the governor of Chistopol, «for the 60-year period of time it has been considerably increased population, the number of villages has been added, the forests have been lessened, and out-of-the-way solitary countries has been ruined completely» [6; L. 26 op.].

The first striking consequence of absence of forests was soil dehydration. In 1856 professor Ewerman wrote: «All lakes and bogs of Kazan vicinities for the last are more and more drying, where there was a lake before, now there is a bog, where there was an impassable bog, it is dry now there» [6; L. 6 op.]. The fact of vanishing not only marshes but the whole lakes in the first decades of XIX century was confirmed in the Chistopol' uyezd as well [6; L. 20 op.]. In the Koz'modem'yansk uyezd many springs and lakes also ran dry, and in the Tsivil'sk uyezd even some small rivers [6; L. 92]. Only in wooded Tsarevokokshaisk uyezd they kept on telling about «enormous woody areas» and «abundance of waters»; though reduction in the size of wild

animals was also observed there, it was rather consequence of changes in the neighbouring regions. The inhabitants of the very Tsarevokokshaisk did not have the slightest idea of what was going on: as a district police officer wrote, «decrease of wildlife has been though observed for more than twenty years already, but there is no any reason of it here» [6, L. 55].

The dehydration of soils - on the one hand, and big fragmentation of forests – on the other considerably transformed the climate and natural landscape of the Kazan territory. Not all species of animals could adapt to new conditions. If in 1856 in the Kazan guberniya there were the reindeers in a great number but the elks were not practically found, but in early XX century the situation became utterly reverse: the reindeers, no having enough feed because of soil drainage and enduring tightness in small remained plots of forest, gave up to the elks [6; L. 6]. The number of waders (double snipes, common snipes and others) considerably reduced. Practically one could find no more the lynxes, bears and martens. Undoubtedly, one of the main causes of reduction of total number of wild animals in the period under study was cruel, excessive hunting, but it was not a determining factor in change of fauna of the region (for example, means and amounts of hunting for the reindeers and elks were on the whole equal, but by the end of XIX century the elks had supplanted the reindeers).

In the end of XIX century deforestation caused the climatic change that, in its turn, became one of the causes of the crop failure in 1891. Rapid snow melting in spring and following dry weather deprived the peasants of winter grain crops and new crops that led to starvation affecting 17 guberniyas of Chernozem'ye and Central Povolzh'ye. The Kazan guberniya became one of the hotbeds of misery.

Though the famine of 1891-1892 years, being one of the manifestations of a crisis of extensive land use, had a great many of economic premises, the contemporaries pushed the climatic change to the first place. Most of landowners noted that the crops grew best of all close by the forest borders – if in the open territory there were practically no harvest then here the crops not only «restored the seeds», but also retained the abundance: «Near the forest lands it helped the grain crops that snow covered the ground and melt slower, therefore the soil had time to thaw out and absorbed snow water. Moreover, the forest protected the soil from eolation» [6; L. 12 op.-13]. The main useful feature of woods for agriculture, from the point of view of contemporaries, consisted in that they «established gradualness» [6; L. 46 op.], that is, made climate fluctuation softer.

Notwithstanding «the tsar-hunger» of the years 1891-1892 showed positive influence of forests on the level of crop yield, for long time the years of bad harvest led to more intensive illegal cutting. The peasants were deprived of straw, usually used as fuel, and more actively cut down neighbouring woods; besides, illegal selling of wood helped partially make up the losses of bad harvest. Deforestation was also caused by the factor that the cleared plots from forest had more fertile soils for the first time [6; L. 35]. Only in the soviet years it was decided to create special forest shelterbelts on the fields.

By the end of XIX century deficiency in wood made manufactures resort to alternative fuel, the most widespread were peat and mazut in the Kazan guberniya. So, yet in 1882 the correspondent of the newspaper «The Volga-Kama Word» pointed to the fact that for the decade from 1862 to 1872 years the wood price in Kazan rose 2 times and kept rising, owing to it he appealed to use abandoned peat bog in the region [7]. However, the large industrial establishments, having industrial boilers at their disposal, preferred to use mazut: as the statistical data show, in 1896 at I. I. Alaphuzov weaving factory there was burnt down wood to the sum of 500 roubles, and mazut almost of 30 000.

It should be noted that, though the transition of factories and mills from firewood to mazut considerably reduced extermination of woodlands afterwards, it also had negative consequences for ecology. For example, in 1896 only Kazan alone there was burnt down mazut to the sum of more than 1 million roubles - about 1000 tons, whereas by boiling down 1 kg of mazut about 52 g of very toxic sulfur dioxide gas (SO₂) escaped into atmosphere.

CONCLUSION

Thus, already in the beginning of XVIII century the economic development and overdevelopment of the region caused the processes that during one and half of centuries radically transformed the landscape of

Kazan district. With reduction of forest areas the climate fluctuations became sharper and more severe, that led to frequent failures of crops. Deforestation caused dehydration of soil, as a result of it hydrosphere of Kazan guberniya considerably got impoverished: the number of lakes, bogs, springs and small rivers decreased. The fragmentation of forests and climatic changes caused rapid reduction of biological diversity – first and foremost, at the expense of those species that need high ground humidity and wide (non- fragmentary) wooded areas to exist: they included waders (woodcocks, double snipes), reindeers, bears, lynxes, martens and others.

In XIX – early XX centuries progressing reduction of wooded areas promoted transition of industrial enterprises from using resources of organic origin to petrochemicals (used in heating) and mineral reagents (used in chemical and technological process). This circumstance slowed down existing deforestation, caused general stagnation of wood-chemical productions being before one of the main «culprits» of extermination of wooded cover, however, raised a series of current ecological problems, characteristic partly for contemporary period as well: air pollution with carbons of oil products, high pollution of atmosphere with gasses in industrial cities and so on.

THE CONFLICT OF INTERESTS

The author confirms that the present data do not contain the conflict of interests.

ACKNOWLEDGEMENTS

The work is performed according to the Russian Government Program of Competitive Growth of Kazan Federal University.

REFERENCES

- [1] Outlines on geography of Tataria / Edited by N.I. Vorobyov, V.N. Sementovsky. - Kazan: Tatarstan Publishing House, 1957. - 357 p.
- [2] Materials for geography and statistics of Russia collected by the officers of General Staff. – SPb., 1861. – 646 p.
- [3] Golubev, P. Cottage industry in Kazan province. - Kazan, 1886. - 58 p.
- [4] The Volga herald. - 1891. - №1891. - 6 p.
- [5] Scott, D. The nature and Space // Man and nature: the history of ecology. - СПб., 2008. - P. 180-251.
- [6] The national archive of the Republic of Tatarstan. F. 359. Op.1. D. 5.
- [7] The Volga-Kama word. - 1882. - №13. - 6 p.