

FORECAST CHANGES IN THE FOREST COVER OF SAMARA REGION AT SUSTAINABLE DEVELOPMENT SCENARIOS

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Scenario analysis is now increasingly being used for planning, evaluation and implementation of decisions relating to environment and sustainable development.

The aim of the study is to forecast changes in the forest cover of Samara region, Russia under various development scenarios.

Research data is based on the results of sociological surveys of the students from the USA (316 pers.) and Sweden (102 pers.), conducted by R. Constanza (1999), and our surveys (Rozenberg et al., 2009) (356 pers.) carried out among the students of Samara region (Russia), as well as data on forest cover in Samara region for the last 300 years (**Fig. 1**).

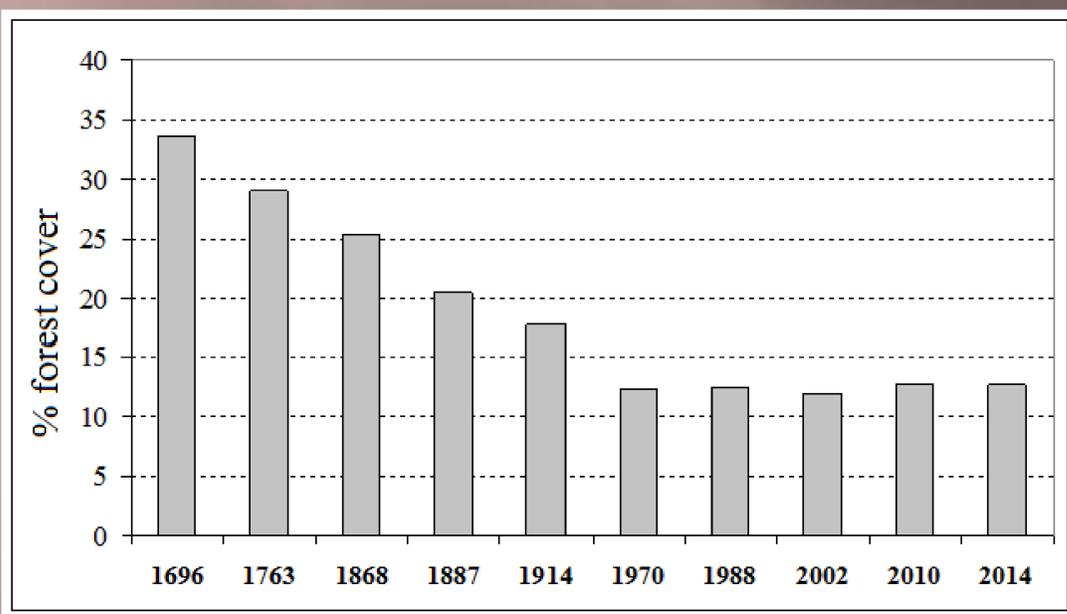


Fig. 1. Dynamics of forest cover in Samara region for the last 300 years

The main research method was empirical-statistical modeling (Rozenberg, 2013) of forest cover dynamics and forecasting of the forest cover under one of the four sustainable development scenarios. The Cobb-Douglas production function was used to describe sustainable development since it defines the exponential nature of the dependence of forest cover from time (**Fig. 2**).

Results and discussion: forecast of forest cover changes in Samara region until 2100 based on the synthetic model taking into account ecological and sociological analysis of human development scenarios showed that the percentage of forest cover in the worst case scenario would be reduced to 0.5% of the area of the region, but under unaltered conditions - to 8%. At the most appropriate scenario the forest cover would be increased up to 18%, while the "utopian" scenario would bring it back to the level of the year 1700.

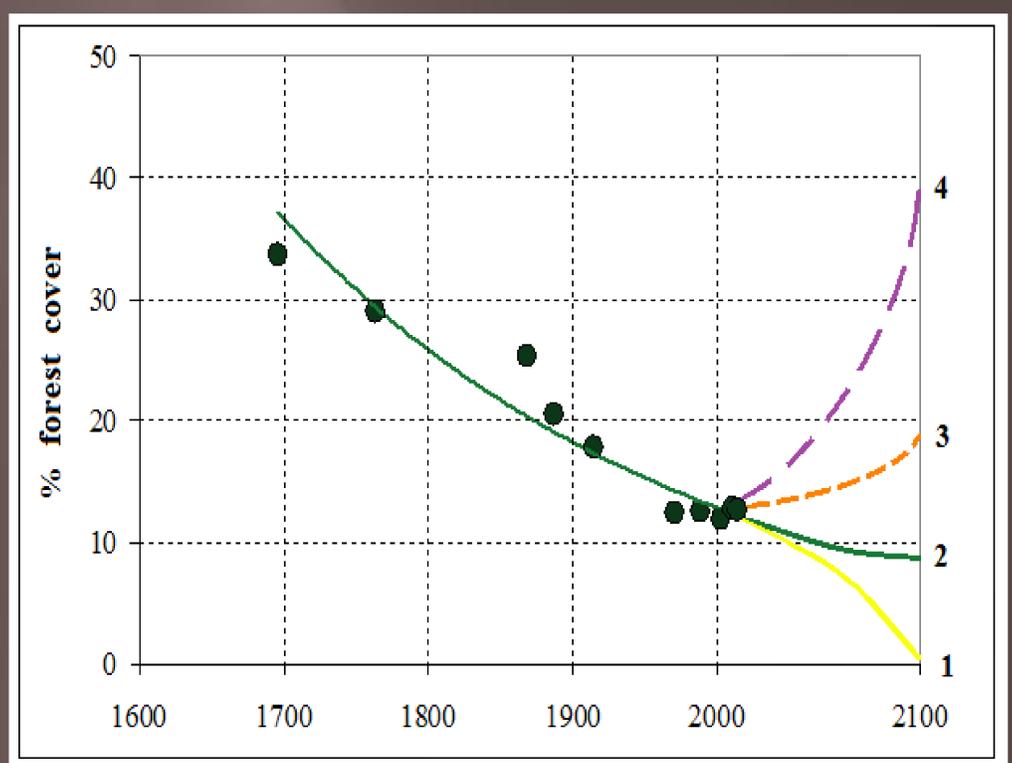


Fig. 2. Operational significance (data points), approximating curve of the forest cover of Samara region for 300 years, and forecasting changes in forest cover at the scenario i ;
1 – "Mad Max", 2 – "Big Government" and the forecast on original equation,
3 – "Star Trek", 4 – "Ecotopia"

Literature:

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- Rozenberg, G.S. 2013. *Vvedenie v teoreticheskiju jekologiju / V 2-h t.; Izd. 2-e, ispravlennoe i dopolnennoe* [Introduction to theoretical ecology / In 2 Vols. ; Ed. 2nd, revised and enlarged]. Togliatti: Cassandra. V.1 556p. V.2 445 p.