

OPTIMIZATION OF SMALL-SCALE LAND USE

Victoria A. Pavlova

Saint-Petersburg State Agrarian University, 2, Peterburgskoe Shosse St., Pushkin, St. Petersburg, 196601, Russia, Ph. D., Associate Professor, Head of the Department of Land Management, phone: (812)476-92-81, e-mail: vikalpav@mail.ru

Elena A. Stepanova

Saint-Petersburg State Agrarian University, 2, Peterburgskoe Shosse St., Pushkin, St. Petersburg, 196601, Russia, Senior Lecturer, Department of Land Management, phone: (812)476-92-81, e-mail: lestepan@mail.ru

Ekaterina L. Uvarova

Saint-Petersburg State Agrarian University, 2, Peterburgskoe Shosse St., Pushkin, St. Petersburg, 196601, Russia, Head of the Laboratory on Land Management, Design and Innovative Technologies in Land Management, phone: (812)476-92-81, e-mail: katrinka-66@mail.ru

In the course of the work on the presented study, the scientific works of leading scientists in the field of land management were analyzed. In the course of their analysis, it was determined that the leading role in the development of the agro-industrial complex and the formation of new relations in rural areas belongs to agriculture. Accordingly, to ensure the proper functioning of small agricultural producers, it is necessary to solve the problem of optimizing their land use. The authors believe that one of the key positions in optimizing the use of territories should be played by "smart land use" and the process of its creation. The paper reveals the process of determining the most significant factors in the formation and functioning of small forms of management, since it is small forms of management that are the most flexible and easily adaptable to the rapidly changing modern economic, legal and social conditions. The evidence base was a statistical analysis of the formation and development of small forms of agriculture of the Russian Federation on a number of indicators: the composition of land, agricultural production, area. The authors propose to identify several groups of factors that affect the optimal parameters of land use. Groups of factors are designated as limiting, optimizing, and supporting. The study also determined the weights of factors that affect the optimal size of land use within each group using the hierarchy analysis method. The proposed factors and the identified dependencies are embedded in the "smart land use" model.

Keywords: small forms of management, optimization, land use, optimal parameters

REFERENCES

1. Karpik, A. P., Lisickij, D. V., Bajkov, K. S., Osipov, A. G. & Savinyh, V. N. (2017). Geospatial discourse of advanced and breakthrough thinking *Vestnik SGUGiT [Vestnik SSUGT]*, 22(4), 53–67 [in Russian].
2. Volkov, S. N., & Shapovalov, D. A. (2019). Digital land management-problems and prospects. In *Sbornik materialov Interexpo GEO-Sibir'-2019: Mezhdunarodnoy nauchnoy konferentsii: T. 3, no. 2. Ekonomicheskoe razvitie Sibiri i Dal'nego Vostoka. Ekonomika prirodopol'zovaniia, zemleustroistvo, lesoustroistvo, upravlenii e nedvizhimost'iu [Proceedings of Interexpo GEO-Siberia-2019: International Scientific Conference: Vol. 3, No. 2. Economic Development of Siberia and the Far East. Environmental Economics, Land Management, Forestry Management and Property Management]* (pp. 26-35). Novosibirsk: SSUGT Publ. [in Russian].
3. Vulević, T., Todosijević, M., Dragović, N., & Zlatic, M. (2018). Land use optimization for sustainable development of mountain regions of western Serbia. *Journal of Mountain Science*, 15, 1471–1480. doi: 10.1007/s11629-017-4777-1.
4. Pennington, D. N., Dalzell, B., Nelson, E., Mulla, D., Taff, S., Hawthorne, P., & Polasky, S. (2017). Cost-effective Land Use Planning: Optimizing Land Use and Land Management Patterns to Maximize Social Benefits *Ecological Economics*, 139, 75–90. doi: 10.1016/j.ecolecon.2017.04.024.
5. Official site of the Russian State Register. (n. d.). Retrieved from Yandex online system.
6. Miklashevskaya, O. V., & Sizov, A. P. (2019). Improvement of state policy in the sphere of spatial development of agricultural territories. In *Sbornik statej Vserossijskoj nauchno-prakticheskoy konferentsii (s*

mezhdunarodnym uchastiem): Aktual'nye voprosy zemlepol'zovaniya i upravleniya nedvizhimost'yu [Proceedings of the All-Russian Scientific and Practical Conference (with International Participation): Current Issues of Land Use and Real Estate Management] (pp. 343–352). Yekaterinburg: UGGU Publ. [in Russian].

7. Garmanov, V. V., Shishov, D. A., & Zavarin, B. V. (2018). Metodiko-metodologicheskie aspekty upravleniya sel'skohozyajstvennym zemlepol'zovaniem: T. Ch. 1 [Methodological aspects of agricultural land use management: Part 1]. St. Petersburg: SPbGAU, 155 p. [in Russian].

8. Shibanova, T. B., & Burova, I. A. (2014). On the question of the main organizational and legal forms of agricultural enterprises in Russia and foreign countries *Izvestiya SPbGAU [Izvestiya SPbGAU]*, 35, 196–201 [in Russian].

9. Morozov, A. V., Bykova, E. N., & Sulin, M. A. (2020). Evaluation of the placement of the land plot of the peasant (farmer) economy taking into account the spatial conditions of the use of the territory *Izvestiya vuzov. Geodeziya i aerofotos"emka [Izvestiya Vuzov. Geodesy and Aerophotography]*, 64(1), 93–103 [in Russian].

10. Borozdin, S. V. (2002) *Zemel'nye otnosheniya i agrarnye reform [Land relations and agrarian reforms]*. Moscow: YUNITI-DANA, Edinstvo Publ., 239 p. [in Russian].

11. Karpova, O. A. (1992). System of regulation of land relations In *Sbornik nauchnykh trudov OmSKHI: Sovershenstvovanie teorii i metodiki organizatsii ispol'zovaniya zemli i ee ocenka pri perekhode k rynochnym otnosheniyam [Collection of Scientific Works of the OmSHI: Improving the Theory and Methodology of the Organization of Land Use and its Assessment in the Transition to Market Relations]* (pp. 9–14). Omsk: OmSKHI Publ. [in Russian].

12. Nepoklonov, V. B., Habarova, I. A., Habarov, D. A., Kiojbash, V. A., & Abdugapirova, I. F. (2018). Improving the efficiency of agricultural land use. *Mezhdunarodnyj sel'skohozyajstvennyj zhurnal [International Agricultural Journal]*, 2, 12–15 [in Russian].

13. Lebedeva, T. A., Gagarin, A. I., & Lebedev, Yu. V. (2017). Sustainable land use in intensively developed territories *Vestnik SGUGiT [Vestnik SSUGT]*, 22(2), 201–211 [in Russian].

14. Garmanov, V. V., Shishov, D. A., Sulin, M. A., Zavarin, B. V., Pavlova, V. A., Glejzer, V. I., Terleev, V. V., Uvarova, E. L., Osipov, A. G., Bogdanov, V. L., & Badenko, V. L. (2018). *Upravlenie sel'skohozyajstvennym zemlepol'zovaniem. prikladnye aspekty: T. Ch. 1 [Management of agricultural land use. applied aspects: Part 1]*. St. Petersburg: SPbGAU, 247 p. [in Russian].

15. Sizov, A. P., Portnov, A. M., Paulyus, K., & Mansberger, R. (2019). Criteria for assessing the sustainable development of suburban areas of urban agglomerations: problems and solutions *Estestvennye i tekhnicheskie nauki [Natural and Technical Sciences]*, 12(138), 201–209 [in Russian].

16. Kondratyev, N. D. (1927). On the issue of differentiation of the village. *Puti sel'skogo hozyajstva [Ways of Agriculture]*, 5, 123–140 [in Russian].

17. Lipski, S. A. (2000). *Zemel'nye otnosheniya i zemleustrojstvo: osnovnye rezul'taty desyatiletiya reform [Land relations and land management: the main results of the decade of reforms]*. Moscow: GUZ Publ., 236 p. [in Russian].

18. Mordincev, A. Ya. (2003). Optimization of land ownership of the peasant economy. In *Sbornik nauchnykh trudov SPbGAU: Razvitie zemel'nyh otnoshenij na sovremennom etape [Collection of Scientific Works of SPbGAU: Development of Land Relations at the Present Stage]* (pp. 52–55). St. Petersburg: Argus Publ. [in Russian].

19. Santiphop, T., Shrestha, R. P., & Hazarika, M. K. (2012). An analysis of factors affecting agricultural land use patterns and livelihood strategies of farm households in Kanchanaburi Province, Thailand. *Journal of Land Use Science*, 7(3), 331–348. doi: 10.1080/1747423X.2011.587208.

20. Celio, E. & Grêt-Regamey, A. (2016). Understanding farmers' influence on land-use change using a participatory Bayesian network approach in a pre-Alpine region in Switzerland. *Journal of Environmental Planning and Management*, 59(11), 2079–2101. doi: 10.1080/09640568.2015.1120713.

21. Karpik, A. P., Zharnikov, V. B., & Larionov, Yu. S. (2019). Sustainable land management in the system of modern spatial development of the country, its basic principles and mechanisms. *Vestnik SGUGiT [Vestnik SSUGT]*, 24(4), 232–246 [in Russian].

22. Pavlova, V. A. (2014). Change in the structure of agricultural land use as a result of land relations reform. *Zemleustrojstvo, kadastr i monitoring zemel' [Land Management, Cadastre and Land Monitoring]*, 9, 58–64 [in Russian].

23. Saati, T. (2015). *Prinyatie reshenij pri zavisimostyah i obratnyh svyazyah. Analiticheskie seti [Decision-making with dependencies and feedbacks. Analytical networks]*. Moscow: Lenand Publ., 360 p. [in Russian].

24. Nepoklonov, V. B., Habarova, I. A., Habarov, D. A., Averyanova, E. A., Gilyuk, A. V., Abdugapirova, I. F., & Kiojbash, V. A. (2017). The use of economic and mathematical methods and models for land management purposes. *Mezhdunarodnyj sel'skohozyajstvennyj zhurnal [International Agricultural Journal]*, 6, 30–33 [in Russian].

25. Lepikhina, O. Yu., Skachkova, M. E., & Mihaelyan, T. A. (2018). Ranking of options of real estate use by expert assessments mathematical processing. *Journal of Physics: Conference Series*, 1015, P. 032084.

26. Lepihina, O. Yu. (2014). Methodology for determining the best and most effective use of the land plot on the basis of expert methods *Ekonomika i predprinimatel'stvo [Economics and Entrepreneurship]*, 4-2(45), 934–940 [in Russian].

Received 12.03.2021

© V. A. Pavlova, E. A. Stepanova, E. L. Uvarova, 2021