

INFORMATION SUPPORT FOR MEASURES FOR RECREATION AND IMPROVEMENT OF AGRICULTURAL LANDSCAPES USAGE

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The article analyzes the reasons constraining productivity increase of agriculture. It is noted that to stabilize the situation it is necessary to take into account ecological condition of the landscapes. The main problem is the absence of actual information about processes taking place in landscapes. The solution of this problem can be the formation of unified landscape – ecological information base linked to digital maps with the help of GIS – technologies. It is suggested to apply LIS "Stable landscape" in project "Digital agriculture" as a subsystem module of "Complex digital solutions for agroindustrial complex" support system of operating activities and implementation of complex digital solutions. Testing results of this module showed the effectiveness of its usage and the need for implementation in the project as it helps providing graphic and attributive BD municipal level of management for the record and monitoring of landscapes, information support of reproduction measures and increasing the productivity usage.

Key words: digitalization, agriculture, efficiency of landscapes usage, information support, GIS-technologies.

REFERENCES

1. Zhelyaskov, A. L., & Seturidze, D. E. (2017). Actual problems of agricultural lands usage and solutions. *Vestnik Kurskoy gosudarstvennoy sel'skokhozyaystvennoy akademii [Vestnik of Kursk State Agricultural Academy]*, 8, 59–64 [in Russian].
2. Reinhard, Ya. R., Makht, V. A., & Osintseva, N. V. (2011). *Sostoyanie, ispol'zovanie i okhrana pochv Omskoy oblasti [State, use and protection of soils of the Omsk region]*. Omsk: Ministry of Agriculture of the Russian Federation, Omsk State Agrarian University Publ., 110 p. [in Russian].
3. Rogatnev, Yu. M., & Dolmatova, O. N. (2017). *Effektivnoe ispol'zovanie zemel'nykh resursov kak osnova ustoychivogo razvitiya sel'skogo khozyaystva regiona (na materialakh Omskoy oblasti) [Efficient use of land resources as the basis for sustainable development of agriculture in the region (based on materials from the Omsk region)]*. Omsk: Omsk State Agrarian University Publ., 188 p. [in Russian].
4. Dolmatova, O. N., Rogatnev, Yu. M., & Sherba, V. N. (2019). Electronic mapping of the fields – the basis of making management decisions of agricultural commodity producers. In *Sbornik materialov mezdunarodnoy nauchno-prakticheskoy konferentsii, posvyashchennoy 70-letiyu ekonomicheskogo fakul'teta [Proceedings of International Scientific and Practical Conference, devoted to the 70th Anniversary of Economy Faculty]* (pp. 279–287). Omsk: Omsk State Agrarian University Publ. [in Russian].
5. Khorechko, I. V., Rogatnev, Y. M., Veselova, M. N., Filippova, T. A., & Kotsur, E. V. (2019). Environmental and economic problems related to rationalizing the use of agricultural lands in the Irtysh land. *International Journal of GEOMATE*, 17(61), 248–256.
6. Dubrovsky, A. V., & Trotsenko, E. S. (2012). The experience of geoinformation technologies usage for projecting of adaptive landscape arable farming use on the territory of NSO. In *Sbornik materialov Interekspo GEO-Sibir'-2012: Mezdunarodnoy nauchnoy konferentsii: T. 3. Ekonomicheskoe razvitiye Sibiri i Dal'nego Vostoka. Ekonomika prirodopol'zovaniia, zemleustroistvo, lesoustroistvo, upravlenii e nedvizhimoist'u [Proceedings of Inter-expo GEO-Siberia-2012: International Scientific Conference: Vol. 3. Economic Development of Siberia and the Far East. Environmental Economics, Land Management, Forestry Management and Property Management]* (pp. 64–68). Novosibirsk: SSGA Publ. [in Russian].

7. Dubrovsky, A. V., Ershov, A. V., & Malygina, O. I. (2015). The elements of modern geoinformation cartographic support for management of municipality. In *Sbornik materialov Mezhdunarodnoy nauchno-metodicheskoy konferentsii: ch. 2. Aktual'nye voprosy obrazovaniya. Vedushchaya rol' sovremennoy universiteta v tekhnologicheskoy i kadrovoy modernizatsii rossiyskoy ekonomiki [Proceedings of International Scientific and Practical Conference: Part 2. Actual Education Problems. The Main Role of Modern University in Technological and Personnel Modernization of the Russian Economy]* (pp. 22–27). Novosibirsk: SSUGT Publ. [in Russian].
8. Dolmatova, O. N., Gileva, L. N., & Kotsur, E. V. (2013). *Geograficheskie i zemel'no-informatsionnye sistemy [Geographic and land information system]*. Omsk: Omsk State Agrarian University named after P. A. Stolypin, 148 p. [in Russian].
9. Dubrovsky, A. V. (2013). *Geoinformatsionnye sistemy: upravlenie i navigatsiya [Geoinformation systems: management and navigation]*. Novosibirsk: SSGA Publ., 96 p. [in Russian].
10. Lisitsky, D. V., & Bugakov, P. Yu. (2011). Cartographic visualization of three-dimensional terrain models. *Vestnik SSGA [Vestnik SSGA]*, 3(16), 81–87 [in Russian].
11. Karpik, A. P. (2004). *Metodologicheskie i tekhnologicheskie osnovy geoinformatsionnogo obespecheniya territoriy [Methodological and technological basis of geoinformation support of the territories]*. Novosibirsk: SSGA Publ., 260 p. [in Russian].
12. Lisitsky, D. V. (2001). Commonality and difference of the meanings "digital model of the territory", "digital card" and "electronic card". In *Tezisy dokladov II nauchno-tehnicheskoy konferentsii: Sovremennye problemy geodezii i optiki [Abstracts of II Scientific Technical Conference: Modern Problems of Geodesy and Optics]* (pp. 143–144). Novosibirsk: SSGA Publ. [in Russian].
13. Lebedev, P. P., Sizov, A. P., & Dontsov, A. V. (2018). Maps in monitoring land system (SML). *Moskovskiy ekonomicheskiy zhurnal [Moscow Economic Journal]*, 5(1), 66–75 [in Russian].
14. Kochergina, Z. F. (2007). *Landscape-ecological basis of rationalization of land use (on the material of forest-steppe zone of Omsk region)*. Omsk: Omsk State Agrarian University named after P. A. Stolypin, 224 p. [in Russian].
15. Lisitsky, D. V., & Katsko, S. Yu. (2005). Purpose and features of digital cartographic picture in geoinformation cartography. In *Sbornik materialov GEO-Sibir'-2005: T. 4 [Proceedings of GEO-Siberia-2005: Vol. 4]* (pp. 23–28). Novosibirsk: SSGA Publ. [in Russian].
16. Lisitsky, D. V., & Katsko, S. Yu. (2013). The concept of creation and functioning of geoinformation space. In *Sbornik materialov Interekspo GEO-Sibir'-2013: T. 2. Plenarnoe zasedanie [Proceedings of Interexpo GEO-Siberia-2013: Vol. 2. Plenary Session]* (pp. 72–75). Novosibirsk: SSGA Publ. [in Russian].
17. Kotsur, E. V., Veselova, M. N., Dubrovsky, A. V., Moskvin, V. N., & Yusova, Yu. S. (2019). GIS as a tool for creating a global geographic information platform for digital transformation of agriculture. *Conference on Applied Physics, Information Technologies and Engineerin. Journal of Physics: Conference Series*, 1399. doi:10.1088/1742-6596/1399/3/033009.
18. Monitoring of agricultural lands: condition and problems. (n. d.). Retrieved from <https://cutt.ly/HrQswKP> [in Russian].
19. Vershinin, V. V., Kovaleva, T. N., Demidova, M. M., & Lebedev, P. P. (2018). Geoinformation projects of land use planning of agricultural enterprises as a basis of digitalization of agriculture. *Moskovskiy ekonomicheskiy zhurnal [Moscow Economic Journal]*, 5(1), 16–27 [in Russian].
20. Departmental project "Digital agriculture". Retrieved from <https://wdco.ru/TAMlo> [in Russian].
21. Departmental project "Digital agriculture" Ministry of Agriculture of Russia. Retrieved from <https://clck.ru/M4S97> [in Russian].
22. Dolmatova, O. N., & Sherba, V. N. GIS – technologies in management of agricultural lands. In *Sbornik materialov mezhdunarodnoy nauchno-prakticheskoy konferentsii, posvyashchennoy 70-letiyu ekonomiceskogo fakul'teta [Proceedings of International Scientific and Practical Conference, Devoted to the 70th Anniversary of Economy Faculty]* (pp. 288–293). Omsk: Omsk State Agrarian University named after P. A. Stolypin [in Russian].
23. Kotsur, E. V., Kapitulina, N. A., & Yusova, Yu. S. (2019). Creation and use of the module "Sustainable agrolandscape" in the framework of the digital transformation of agriculture. In *International Scientific and Practical Conference "Digitization of Agriculture – Development Strategy" (ISPC 2019): Vol. 167. Advances in Intelligent Systems Research* (pp. 93–97). Atlantis Press.
24. Kotsur, E. V., & Veselova, M. N. (2016). Use of GIS MapinfoProfessional in creation of landscapes card (for example of Pavlogradsky district of Omsk region). *Vestnik Omskogo gosudarstvennogo agrarnogo universiteta [Vestnik of Omsk State Agrarian University]*, 2(22), 121–127 [in Russian].

25. Kotsur, E. V., & Veselova, M. N. (2015). Ecological and economic landscapes zoning of Pavlogradsky municipal district of Omsk region. *Omskiy nauchnyy vestnik [Omsk Scientific Bulletin]*, pp. 186–190 [in Russian].
26. Kotsur, E. V., & Kochergina, Z. F. (2013). Use of ecological and economic zoning and typing of lands for the detailed accounting of landscapes natural features. In *Sbornik materialov vtorogo Mezhdunarodnogo nauchno-tehnicheskogo Forum: Realizatsiya gosudarstvennoy programmy razvitiya sel'skogo khozyaystva i regulirovanie rynkov sel'skokhozyaystvennoy produktsii, syr'ya i prodovol'stviya: innovatsii, problemy, perspektivy [Proceedings of the II International Scientific and Technical Forum: Realization of the State Program of Agricultural Development and Regulation of Agricultural Production Markets, Raw Material and Food: Innovation, Problems, Perspectives]* (pp. 291–294). Omsk: Omsk State Agrarian University Publ. [in Russian].
27. Kotsur, E. V., & Veselova, M. N. (2016). Construction of high productive and ecologically stable agrolandscapes of the south of Omsk region (for example of Pavlogradsky district of Omsk region). In *Sbornik dokladov III Mezhdunarodnogo konkursa nauchno-issledovatel'skikh rabot: T. III: Estestvennye i tekhnicheskie nauki [Collection of Reports of III International Competition of Scientific Research Works: Vol. III: Natural and Technical Sciences]* (294 p.). A. V. Gumerov (Scientific editor). Kazan: OOO "Raketa Soyuz" Publ. [in Russian].

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