On the possibility to adopt the historical practice of applying technologies for land fertility increase in Eastern Prussia at agricultural enterprises of the Kaliningrad region

Levina, Roza S.; Voloshenko, Ksenya Yu.

Veröffentlichungsversion / Published Version
Zeitschriftenartikel / journal article

Empfohlene Zitierung / Suggested Citation:
Levina, R. S., & Voloshenko, K. Y. (2012). On the possibility to adopt the historical practice of applying technologies for land fertility increase in Eastern Prussia at agricultural enterprises of the Kaliningrad region. *Baltic Region*, 2, 85-91. https://doi.org/10.5922/2079-8555-2012-2-9

ON THE POSSIBILITY TO ADOPT THE HISTORICAL PRACTICE OF APPLYING TECHNOLOGIES FOR LAND FERTILITY INCREASE IN EASTERN PRUSSIA AT AGRICULTURAL ENTERPRISES OF THE KALININGRAD REGION

R. S. Levina

K. Yu. Voloshenko[*]

This article considers the features of East Prussian land use system, whose crucial component was technologies for land fertility increase. A special package of measures in the framework of melioration and irrigation activities accounted for the high productivity of agriculture in this territory despite the fact that the local climate conditions can hardly be called perfect according to the well-known principles of agricultural science. The authors offer an overview of scientific approaches to the reconstruction and practical application of ideas and principles of progressive agriculture consistent with a more general area of organic agriculture. Special attention is paid to the modern agricultural practice in the territory of the Kaliningrad region — former East Prussia — and the possibilities to use the methods for increasing land fertility that were intensively employed by Prussians.

***Key words*:** agricultural enterprises, land use, land fertility, melioration system, organic agriculture

The agrarian history of East Prussia being the subject of a constant debate by scholars and practitioners in defining its role and importance in the provision of food to the rest of Germany and other European countries (especially England) remains an example of successful development of agricultural production through technological innovation along with hard work and diligence of many generations. In the absence of favourable natural climatic conditions for high-yielding farming, East Prussia became an agricultural province, 'so that it ranks third in this

* Immanuel Kant Baltic Federal University
14, A. Nevski St., Kaliningrad,
236041, Russia

Received on April 16, 2012.

doi: 10.5922/2079-8555-2012-2-9

respect, compared to others,... in the state' [2, p. 148]. However, it should be noted that in many respects the agricultural specialisation of that territory was formed under the influence of external conditions namely the onset of the industrialisation accompanied by structural change which was to increase the role of industry and reduce the importance of agriculture in European countries including Germany. In response to the new market demands, increasing exports and domestic demand, there was an expansion and growth of the agricultural output, which required in conditions of the shortage of land and capital searching for new ways to improve soil fertility and create a new land use of East Prussia.

The success of East Prussia in the development of agricultural production, especially the high-quality durum wheat and cattle breeding, sparked a strong interest of the world in the Prussian farmers' land use and agricultural practices. Special focus was on setting-up a land reclamation system in the implemented technological innovations in East Prussia.

The reclamation system of East Prussia had certain features; it was intended for only individual land use. In this context, the reclamation network was adapted not only to the landscape but also the boundaries of land use in which the necessary conditions were created for the cultivation of certain crops.

As pointed out by A. M. Sologubov in the study of spatial patterns of the Kaliningrad region, 'in terms of its complexity and fitting of working parts the reclamation system of East Prussia belonged to one of the best in Europe. This was recognised after the War by the Soviet reclamation services. Originally, reclamation works were publicly funded. In the mid-nineteenth century, the responsibilities for land reclamation and maintenance of reclamation systems were transferred by the state to non-governmental organizations, land-reclamation partnerships, the number of which in East Prussia in 1928 was 597'[1]. Reclamation systems became more complex and dense that required from the land users and reclamation partnerships more coordinated actions and determined various forms of cooperation in the field.

The studies of the innovative component of reclamation of East Prussia make it possible to single out the following types of drainage and irrigation applied within the established boundaries of land use:

1) reclamative drainage of excess subsoil and soil water to the areas that are below sea level;

2) cascaded water supply to soil arranged along natural rivers in the region;

3) cascaded irrigation of soils arranged by cascade linking of natural water bodies;

4) cascaded water supply to soils arranged by cascading artificial water bodies;

5) water supply to soil through the running shallow marsh evaporation of moisture subject to capital measures designed to prevent bogging-up and

[1] Sologubov, A. M. 2010, *Masshtabnye izmenenija prostranstvennyh struktur v Kaliningradskoj oblasti posle 1945 g.* [Large-scale changes in spatial patterns in the Kaliningrad region since 1945], available at: http://www.gako.name/mainsite/informingpublic/2010-03-27-10-55-00/447-1945- (accessed 14 March 2012).

formation of marsh wetlands by multi-layer strengthening the bottoms of wetlands with gravel, sand and clay;

6) purposeful flow of underground waters by creating forest plantations consisting of conifers capable of absorbing moisture.

The above six types of reclamation were selectively used in the former East Prussia. This is consistent with current scientific recommendations for reclamation and water supply to soil and subsoil [1] (Fig. 1).

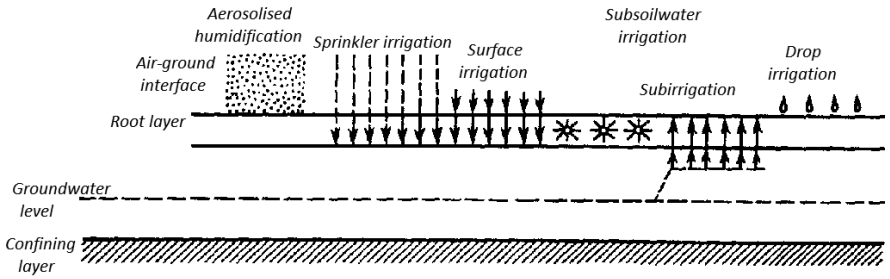

Fig. 1. Modern irrigation methods implemented in East Prussia and recommended by researchers

The listed types excluded the aerosolised humidification and drop irrigation methods; but a combination of humic compounds produced by specially bred earthworms and irrigation moisture was also widely used.

Education in the East-Prussian Kaliningrad region and the subsequent establishment of large-scale socialist economy through the creation of collective farms and state farms almost completely destroyed the reclamation system operated here. First of all, the established boundaries of individual land use were violated. Consequently, some drainage systems were within the boundaries of different land users (collective and state farms, forestry etc.), and in the context of a variety of soil it made it impossible to efficiently run any agricultural activities, different modes of reclamation were used in relation to the same crop. Secondly, due to the absence of the German technical documentation for drainage systems, land planning was performed only at the open drainage network. Thirdly, the open land reclamation system was destroyed by plowing when the boundaries of land use were changed and the farms enlarged.

Keeping up the soil fertility was supported by chemicals actively used in agriculture, i. e. fertilisers, the chemical reclamation of soils (application of gypsum and lime), the protection of plants from weeds, pests and diseases, the use of chemical stimulants which accelerate the development of plants etc. However, that was done to the detriment of the historical farming methods that had proven their effectiveness in providing a highly productive agriculture. The attempts of both Soviet and German engineers regarding the recovery of the East Prussian reclamation system yielded no positive results.

The farming practices used in the 1920s led to a growing crisis in agricultural production which made itself felt in the degeneration of the seed reserves and reduced livestock due to diseases and deterioration of the soil quality (erosion, acidification). To obtain a stable yield, it was necessary to apply more

and more fertilisers, which in turn, significantly weakened the ground and plants, impaired the quality of food [5]. All this resulted in the revision of soil fertility technologies and led to the development of organic agriculture[2], one of the areas of which was the bio-dynamic method that was attractive only in terms of its testing and development in Germany in response to the successful centuries-old achievements of the Prussians in technologies. One of the pioneers in the bio-dynamic farming methods, a German farmer, company director, consultant and researcher E. Pfeiffer, who in a series of publications on the application of this method, which arose on the basis of the ideas and proposals of Rudolf Steiner [6], studies the issues of effective land use in Germany giving an example of the farmers of East Prussia [3].

The organic (bioorganic) agriculture which evolved primarily in Germany and the United States gained in popularity every year. This is due to rapidly sharpening global issues related to human health, food safety and environmental protection, although the comestibles problem also remains vital, and solution of the food problem is largely determined by the successes of 'traditional' agriculture. The ecologically cultivated areas keep extending every year, the demand for environmentally friendly products increases, and the governmental support for the agricultural producers of organic products becomes more enhanced.

Progress and achievements of organic agriculture today have been identified, and they in fact provide the basis for its development:

— principle of health (to sustain and enhance the health of soil, plant, animal, human and planet as one and indivisible);

— principle of ecology (to ensure greening production environment, the existence of natural ecological systems and cycles);

— principle of fairness (to ensure fairness at all levels and to all parties — farmers, workers, processors, distributors, traders and consumers);

— principle of care (precaution and responsibility are the key concerns in management, development and technology choices)[4].

The organic agriculture is practiced in almost 160 countries around the world, but the most developed countries in the sector are in Western Europe including the Baltic region, and North America. As of 2010, some 30% of the organic agricultural land in Europe (9.3 million hectares) and 7.5% of the world's farmland (37.2 million hectares) are in the Baltic region (Fig. 2).

---

[2] '*Organic agriculture* is a holistic production management system which promotes and enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. <…> This is accomplished by using, where possible, agronomic, biological, and mechanical methods, as opposed to using synthetic materials (*note:* chemicals in agriculture will be excluded), to fulfill any specific function within the system, available at: http://www.fao.org/organicag/oa-faq/oa-faq1/ru/ (accessed 13 April 2012).

[3] *Bio-dynamic method* is an area of organic agriculture which affects the spiritual foundations and cosmic aspects (cf. e.g. [4; 6]).

[4] See.: Mezhdunarodnaja federacija dvizhenij za organicheskoe sel'skoe hozjajstvo [Principles of Organic Agriculture], *IFOAM General assembly*, available at: http://www.ifoam.org/about_ifoam/pdfs/POA_folder_russian.pdf (accessed 13 March 2012).

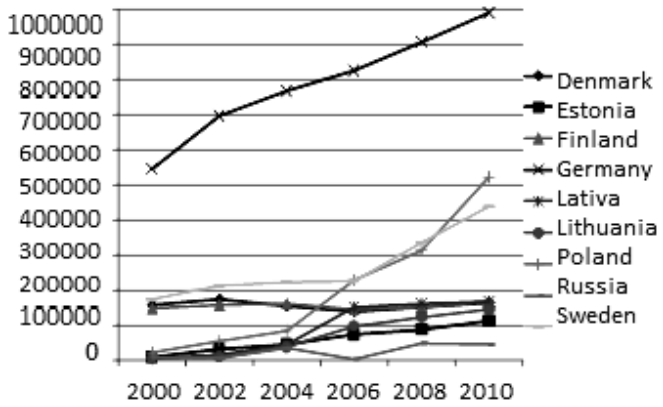

Fig. 2. The growth of organic farmland area in the Baltic region, 2000—2010, ha

Source: [7].

The annual growth is in the range of 7 %. The largest organic areas are in Germany (0.990 million hectares), Poland (0.522 million hectares) and Sweden (0.439 million hectares). At the same time, the share of organic land is higher than 10 % in such countries as Sweden (12.6 %) and Estonia (10.5 %) [7].

The organic products sales volume in the Baltic region was 7.8 billion Euros in 2010 which corresponds to 40.0 % of the total sales in Europe and about 25.5 % of the global turnover (Fig. 3).

The current status of rural entrepreneurship and the level of agricultural development in the Kaliningrad region indicate that the regional reclamation system is a key issue. The level of land reclamation, according to various estimates, is about 90—95 % there. According to a soil survey of the Environmental Geology and Geography Department of the I. Kant BFU, erosionally dangerous soil was identified in the region which occupies 104.9 hectares accounting for 20 % of all the agricultural land, 98 hectares are covered by the polder land protected from flooding (725.09 km dykes). Of all the reclaimed land of the Kaliningrad region in agricultural use is 593,100 hectares of reclaimed (including 332,600 hectares of the arable land) and 1.8 ha of irrigated agricultural land (including 1.2 hectares of the arable land). Today there is a need for an immediate reclamation of agricultural land in the area of 594.6 hectares including the reconstruction of drainage and sewer and open regulatory network of an area of 109,800 hectares, repairs on an area of 107.8 hectares [3].

The achievements in organic farming and the facts about the importance and role of the Prussian agricultural technologies demonstrate their relevance in the agricultural business activities in the current context including the Kaliningrad region. It is also a crucial issue to develop the technologies to improve soil fertility on the basis of innovations in the field of reclamation and irrigation following the general trend in organic farming methods.

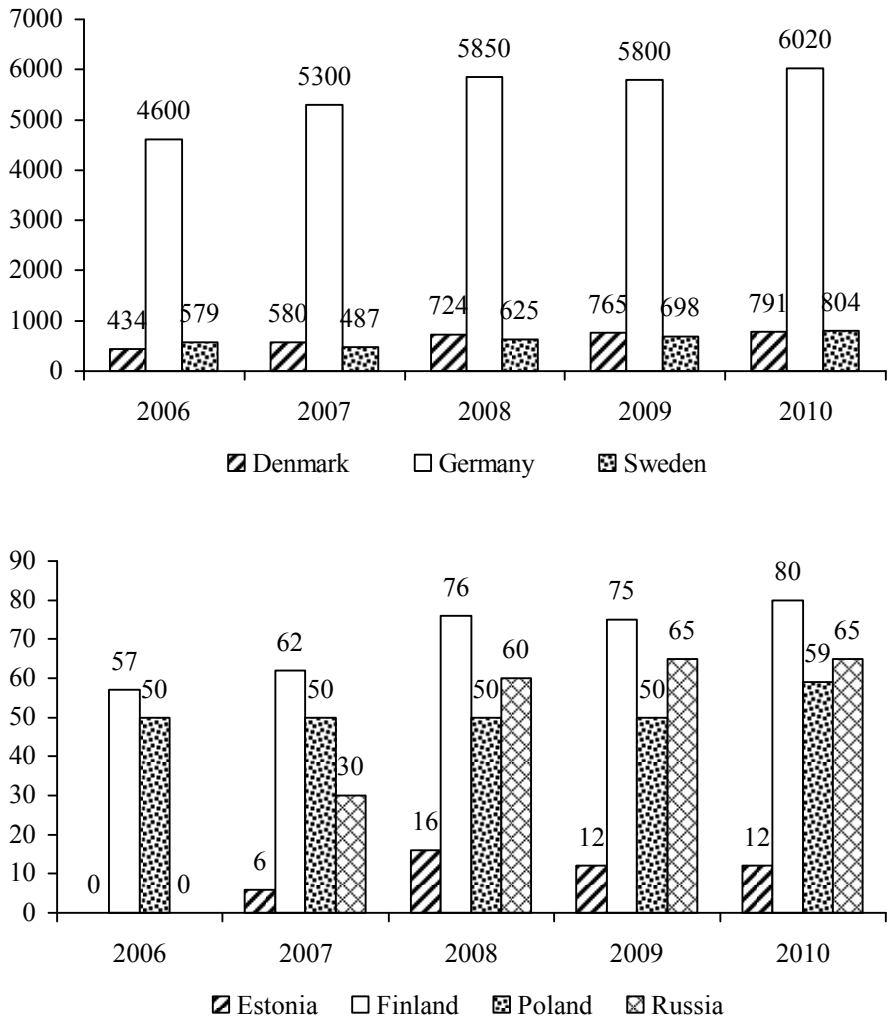

Fig. 3. The organic foodstuffs sales volume in the countries of the Baltic Sea Region, 2006—2010, million Euros

Source: [7].

First of all, the special status of the Kaliningrad region in the federal programme for the development and reclamation of polders (diked marshes) in the region should be activated and defined. Maximum advantage should be taken of the history and experience of reclamation of the said territory taking into account the achievements of East Prussia and the specific operation of the reclamation system in the Kaliningrad region.

Secondly, government support at both the federal and regional levels to the agricultural businesses which implement the innovative projects and follow the principles of organic agriculture should be strengthened. In addition, at the federal level addressed should be the issues related to the development

of appropriate regulatory and legal support to regulate the organic agriculture and certify the organic products.

Thirdly, given the high capital intensity of the proposed measures for the development of organic farming principles, a more detailed study and further incentives to the creation of and interaction between agricultural businesses and agricultural holdings as well as the establishment of a business community network in the Kaliningrad region and beyond are required.

The implementation of the above priorities will provide an appropriate basis for further technology innovations in the Kaliningrad region and address the issue of agriculture 'recovery' while ensuring food security and availability of high-quality food to the public.

References

1. Seidelmann, F. R. 2003, *Melioracija pochv* [Amelioration of soil], Moscow, Izd-vo MGU, 448 p.

2. Kostyashov, Yu. V. 2010, Rossijskie rabochie v Vostochnoj Prussii v konce XIX — nachale XX veka [Russian workers in East Prussia in the late XIX — early XX century], *Vestnik Rossijskogo gosudarstvennogo universiteta im. I. Kanta* [Vestnik Immanuel Kant State University of Russia], no. 6, p. 148—154.

3. Lebedinskaja, T. 2010, Meliorativnoe hozjajstvo nuzhdaetsja v edinom upravlenii [Reclamation, agriculture needs to be a single management], *Kaliningradskij agrarij* [Kaliningrad Farmer], no. 20 (240), 15 Nov. 2010, available at: http://agrariy-39.ru/number/archiv/detail.php?ID =1018&sphrase_id=2224 (accessed 10 April 2012).

4. Podolinski, A. 2003, *Vvedenie v biodinamicheskoe zemledelie* [An introduction to biodynamic farming], Kaluga, «Duhovnoe poznanie», 212 p.

5. Pfeiffer, E. 1994, *Plodorodie zemli, ego podderzhanie i obnovlenie* [The fertility of the land, its maintenance and renewal], Kaluga, «Duhovnoe poznanie», 113 p.

6. Steiner, R. 1997, *Duhovnonauchnye osnovy uspeshnogo razvitija sel'skogo hozjajstva* [Spiritual-scientific basis for the successful development of agriculture], Moscow, 432 p.

7. *The World of Organic Agriculture 2011,* available at: http://www.organic-world.net/fileadmin/documents/yearbook/ 2011/world-of-organic-agriculture-2011-page-1—34.pdf (accessed 10 April 2012).

About the authors

Prof. Roza S. Levina, Department of Marketing and Commerce, Faculty of Economics; Senior Research Fellow, "The socioeconomic and innovative development of the region" research and education centre, Institute for Regional Studies, Immanuel Kant Baltic Federal University.

E-mail: RLevina@kantiana.ru

Dr Ksenya Yu. Voloshenko, director of the "The socioeconomic and innovative development of the region" research and education centre, Institute for Regional Studies, Immanuel Kant Baltic Federal University.

E-mail: KVoloshenko@kantiana.ru