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APPLICATION OF CARTOGRAPHIC METHOD FOR STUDY AND RATIONAL USE OF LAND RESOURCES

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In accordance with the permanent development of Soviet agriculture, its specialization and concentration on the base of interfarm cooperation and agro-industrial integration, improvement of agricultural management - problem of rational land use and land resources protection becomes more and more important. Especially it's true for lands which belong to collective and state farms and other state users of agricultural lands which occupy 1048.1 mil. hectares (47%) of the total land area of the USSR.

Cartographic method becomes especially important for study, planning and forecasting of rational use of land resources. It depends on wide possibilities of maps, because they are more informative then other sources, allow to find tendencies in land use development dynamics, provide scientific planning and forecasting of state services and surveys, which have to support the organization of protection and rational land use on the state level.

Mapping of agricultural lands is the main component of general complex programme of mapping in the USSR.

Study of agriculture, natural, social and ecenomic factors of its development in mutual connection and dynamics is provided by creation of uniform system of cartographic materials. They are: agricultural atlases, separate agricultural maps and its series, which have special importance. Such maps in accordance with levels of management and planning of agricultural development include all agricultural and administrative units (collective and state farms, regions, republics and the USSR as a whole). Such series of maps are often included in complex geographical atlases.

The characteristic feature of land mapping is the tendency

to systematic show of land resources of each agricultural and administrative units, to creation of maps, which can fully reflect all aspects of current and prospective land use.

The main tendencies of this type of mapping are shown also in constant increase of maps quantity, in elaboration of new types of maps which can close correspond to modern scientific and practical aims. New analytic and systematic maps distinguished by high level of informativity and more wide possibilities of reflection of quantitative and qualitative features are also making.

Land mapping is based on some principles which flow out from the metodology of soviet cartography. They are: reflection of the whole characteristic of land resources and its dynamics; coordination and close connection between maps which help to show current land use protection; demonstration of dependence and interrelations between land resources, agriculture and industries; reflection of main conformities of territorial organization of agriculture and typical and local features of land use.

This metodological principles alongside with the specific of the mapping object and demands to cartographic method in application to land use management and planning, have conditioned scientific features which are used in elaboration of land use system of maps. First of all necessary characteristics have to be reflected by minimum quantity of maps. Each of them characterize one of the main aspects or factors of the theme. Necessary information in quantitative and qualitative forms is expressed by absolute and relative indexes (or uniform system of indexes) which are used at land inventory and land cadaster works, at land use forecasting etc.

Recommendations on rational land use and land improvement are maximally reflected in graphic and text forms. Great attention is paid: to coordination of one-type maps which are created for different economical and administrative units; to mutual connection of all land resources maps on the ground of uniform geographical base; to clear divide of various thematic elements of map content; to use of modern methods of land resources reflection and to technology of colourful maps' making;

Elaboration of programmes is fulfilled by cartographers, soil scientists, land use managers and other specialists.

As a rule, at present tyme we have series of special maps for the territory of each collective and state farm. These series include maps of general land use, soil maps, maps of wild hay resources, soil fertility and acidity, maps of soil erosion, land improvement maps, maps of regional land management which also contain recommendations on land use improvement and organization etc.

Soil and agro-chemical maps are made on the base of results of large-scale soil surveys and are necessary for solving of problems, connected with the intentions to improve present land use, rotation systems, systems of soil cultivation and fertilization, measures of land amelioration, liquidation of soil erosion, improvement of environment, land classification etc.

Soil erosion maps show distribution of different categories of eroded soils in the limits of land users in accordance with the physiography of the territory, moisture and subsoil character. It is recommended definit system of practical measures of land use for each category.

Chemical land amelioration maps show distribution of acid

soils which need use of certain rates of lime etc.

Wild hay resources maps show areas of different types of wild hay resources distribution. They also contain practical suggestions on improvement of its productivity.

Land classification maps advise recommendations on practical use of the territory in dependence of needs of different branches of industry and agriculture. These maps also contain recommendations on productive use of agricultural land by collective and state farms and they are the base for rational land use of the territory.

Field agro-chemical surveys of cultivated lands in farms allow to create maps of soil fertility, acidity, alcalinity and so on. In accordance with these data it is possible to determine rates and ways of soil fertilization. Now maps of such a type are also elaborated for wild hay resources.

As usual, projects of farm land use management show: borders of collective and state farms, of state forests, and agricultural stations; hydrography (rivers, lakes, ponds); soil and vegetative cover (forests, bushes, modern and projected forest shelter belts, bogs sands etc.); distribution of settlements; transportation network; social and cultural elements (hospitals, schools, post-offices etc); rotation fields (grain, vegetable and other); gardens, vineyards, pastures and ranges; irrigation and drainage systems; complex of anti-erosional measures.

All other maps for the territory of state or collective farm characterize different measures on land amelioration, improvement of natural agricultural resources, anti-erosion hydro- and agro-technical works.

Land resources of administrative units, its statement and

current use are reflected with the series of maps and scemes: land use, soil cover, land fertilization, land use management, categories of eroded soils, pastures and ranges and ways of its improvement.

Current land use maps are usually used for fixation of changes in statement and boundaries of separate agricultural and other interprises. It is very important for the solving of some organizational problems. These maps show boundaries of agricultural and nonagricultural land users, boundaries of settlements, hydrography, roads.

As a result of generalization of soil and other data of state and collective farms there are created following maps for administrative units: maps of soil cover, maps of categories of eroded lands and anti-erosion measures, maps of soil fertilization, maps of soil classification and maps of natural and agricultural ~~ag~~ micro-regionalization.

Soil maps for regions have the same principles of preparation as maps for agricultural enterprises. These maps repeate almost all their content in generalized form. The same is true for regional maps of soil erosion, soil fertility, wild hay resources. Nevertheless some small differences may occur.

On the base of the principally new agricultural typology of lands maps of its classification are made. The main aim of this classification is division of agricultural territory into separate units in dependence of specific features of soils, moisture, physiography.

Above mentioned maps syntesise all important data about natural conditions of the territory and are the base for creation for small-scale regionalizing and for solving dif-

ferent problems, connected with agriculture.

Quite new and original map is the scheme of land use management for administrative unit or a group of farms.

Contents of such regional maps of land use includes territorial boundaries of regions, collective and state farms, state forests, main rivers and roads, names of agricultural enterprises, and administrative centers.

On regional soil maps there are shown data on main soils and soil complexes, texture, subsoil and bedrocks.

Alongside with the regional soil maps there are also maps of soil erosion. They contain data on percentage of severe, average and weakly eroded areas.

On regional general scheme of anti-erosion measures for 1976-1980 years there is performed the dependance of kind and intensity of erosion. Complex of various anti-erosion measures for each zone is fixed.

As soon as forecasts of land use and land resorces conservation is accomplishing for territories of different administrative units schemes of land use management will become more widespread.

Land use, soil, land resources conservation, anti-erosion maps for a republic have just the same contents as for a region. In the nearest future it is intendede to widen subjects of land appraisal maps in application to administrative units.

General schemes of land resources use for the territory of the USSR republics and other administrative units will increase scientific basis of complex land use management projecting, which includes measures of land amelioration, concervation, social and economic planning.

Besides of above mentioned maps of land resources, which

are desined for the purposes of management and planning of agriculture, large quantity of maps for the specific investigations are elaborated and being published in atlases, encyclopaedias and various monographs.

Mapping of nonagricultural lands is successfully being accomplished now (forest and water resources, settlements etc). So, creation of rational system of land resources mapping is being accomplished now. Complex of this system's maps fully charecterize statement of land resources, including distribution, appraisal, current and prospective land use. Scientific surveys also develop actively. In particular there is elaborated theoretical base for large-, medium- and small scale land mapping. This base provides ground for the themes of maps, their projections, scales, contents and way of image of changes, rational technology of compiling and multiplication of maps.

For the purpose of study of various maps' use by managing and planning organizations, there was undertaken special investigations with the participation of specialists in agriculture from a republic, 7 regions, 12 districts, some hundred state and collective farms and some inventory and educational agricultural institutes.

One of the principle problem of this investigation was the collecting of information about intensity of agricultural plans, maps and atlases use (including land resources maps). Also it was important to know which problems could be solved with the help of these materials, the degree of practical needs satisfaction, requirements in new subject maps.

All collected, generalized and carefully analysed results of the undertaken investigation have shown that plans

maps and atlases are stable parts of agricultural land use management and planning.

The most part of participants of the interrogation (71%) use these materials often or currently.

Collected data show that following maps are used more often: maps of farm land use management (28% of answers), regional and republican land use maps (22% of answers), maps of soil erosion and anti-erosion measures (11% of answers).

The investigations have shown that besides their direct design - study and organization of land use - maps of land resources and other agricultural maps are widely used by managers and specialists at solving of following tasks: study of farm, region, republic (18% of answers); analyses of economic activities (13%); planning of current agricultural works (13%); various measurments (12%); operational management of economic (11%).

In the main suggestions about widening of map's subjects also concerned land use maps and confirmed that current and prospective directions of mapping was quite correct. First of all it was advised to create land appraisal maps (16%) and land use maps (12% of answers).

Of course, it is necessary to do mush in land resources mapping and application of cartographic method for deeper study, forecasting and planning of land use.

Further success of this important kind of thematic mapping will mainly depended on solving of scientific problems of general theory of complex land mapping development, elaboration of new types of mapes, mathematical modelling of map content, improvement, unification and standartization of imagination methods and means of design, wide use of remote sensing materials and computer's data, elaboration and wide

use of technology of colourful small circulation maps mimeography, creation of more effective methods of land resources maps use in planning and management of economics.

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