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ECOLOGICAL NATURE PROTECTION MAPPING IN ASIAN COUNTRIES: HISTORY AND PERSPECTIVES

The article analyzes conditions of ecological nature protection mapping in Asian countries during 1945-2010. Tendencies and features of this mapping direction have been determined. Experience of ecological nature protection mapping in different Asian countries on the example of thematic maps, series of maps and atlases published and placed in the Internet have been considered. Special attention has been paid to conditions of ecological nature protection mapping of Iraq Kurdistan territory.

Keywords: ecological nature protection mapping, Iraq Kurdistan, Asian countries, map, atlas, ecological and nature protection Internet maps.

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ЕКОЛОГО-ПРИРОДООХОРОННЕ КАРТОГРАФУВАННЯ В АЗІЙСЬКИХ КРАЇНАХ: ІСТОРІЯ ТА ПЕРСПЕКТИВИ

У статті проаналізовано стан еколого-природоохоронного картографування у країнах Азії за період 1945-2010 рр. Визначено тенденції та особливості даного напрямку картографування. Розглянуто досвід еколого-природоохоронного картографування в різних азійських країнах на прикладі розміщених в Інтернеті та опублікованих карт, серій карт і атласів даної тематики. Особлива увага приділена стану еколого-природоохоронного картографування території Іракського Курдистану.

Ключові слова: еколого-природоохоронне картографування, Іракський Курдистан, країни Азії, карта, атлас, екологічні та природоохоронні Інтернет-карти.

Introduction. One of actual problems in ecological mapping is study of its history, tendencies, definition of its development ways. It is especially vital in ecological and nature protection mapping issues in the countries which had no special cartographical products of the given subjects in view of various reasons - backwardness of this direction in the country, undetermined borders of the region (for example, Iraq Kurdistan), etc.

Initial preconditions. Ukrainian scientists A.P. Zolovsky, G.O. Parkhomenko, Ye.Ye. Markova [1], I.Yu. Levitsky and V.A. Peresadko [3 - 7] paid much attention to research of ecological nature protection mapping history. Much later, in 1995, N.N. Komedchikov and A.A. Liuty prepared the catalogue of ecological maps of Russia which included wildlife management maps, medical – geographical maps and maps which only include elements of ecological nature protection subjects [2]. We

have not found any monographs and/or bibliographic reference books concerning history of ecological mapping in foreign countries, in particular in Asian countries in libraries of Ukraine and Russia, the Internet also holds back this part of thematic mapping history. Practically a single source containing the information on ecological and nature protection issues in foreign atlases was a handbook «Atlas mapping of nature protection and use of natural resources. Analysis of foreign atlases maps» published in 1987 [3].

The purpose of the article is to deal with history of ecological nature protection mapping in Asian countries and define directions of ecological nature protection mapping in Iraq Kurdistan.

Statement of basic material. On the basis of study of a considerable quantity of published and hand-written maps, series of maps and atlases it is possible to distinguish basic features of ecological nature protection mapping on all extent of its development:

1. Modern ecological nature protection mapping rests on experience of nature protection, medical-geographical, assessment-resource, ecological and other related directions of thematic mapping.

2. Ecological nature protection mapping is realized both by creation of special ecological or nature protection cartographical products, and inclusion of ecological nature protection indicators in general geographical thematic maps and atlases.

3. Throughout the history ecological nature protection mapping has passed a number of development stages, each of which is characterized by certain features in display of ecological nature protection subjects and prevalence of individual directions in mapping.

Long-term research of ecological nature protection mapping carried out at the Chair of physical geography and mapping of V.N. Karazin Kharkiv national university allows us to assert that ecological nature protection mapping in the countries of Asia has never taken leading place in thematic mapping [9]. Three directions prevail in these countries: general geographic, land-resource and tourist. Development of the first was promoted by military conflicts. It has led to the fact that

the leading cartographical countries - the USA, the USSR (then Russia), Great Britain have put maximum of efforts on creation of large scale maps system for territories of Afghanistan, Vietnam, Pakistan, Iraq, India, etc. Land -resource mapping has been developed, as in the majority of the states, thanks to land -cadastral works, and the tourist mapping – because of tourism [7].

The fact that ecological and nature protection directions in the Asian countries have never (at least, last century) been a priority is supported by the information that from 227 atlases of different regions and the world countries in which the ecological or nature protection subjects are found out, only 21 are Asian. Only 3 from 21 are general geographic atlases, 8 – land-resource and 9 – tourist. The illustrated directory on Iraq published in 1962 refers to the latter.[6].

Mapping of land reclamation and protection steps which has almost two hundred year's history - irrigating systems and installations were represented on ancient Indian, Arabian and Chinese maps can be named as one of the first directions of ecologic nature protection mapping.

In the new millennium the situation has changed a little promoted by two reasons: disintegration of the USSR and Internet appearance.

How the condition of ecological mapping was affected by the first reason? First of all, disintegration of the Soviet Union has led to creation of the independent states which inherited tendencies, directions and approaches to ecological and nature protection mapping, namely:

- a) priority depiction of nature protection subjects;
- b) secondary attention to the ecological information;
- c) unwillingness to reflect dependence between diseases (health) of the population and an environment condition.

As to the states which were guided by a socialist way of development (Vietnam, China, Laos, Iraq ,etc) in the field of ecological nature protection mapping they have the same pluses and minuses as Post-Soviet states of Asia (Turkmenistan, Kazakhstan, Uzbekistan, etc.).

Certainly, appearance of the Internet has not only improved communicative possibilities of mapping but also promoted fast exchange of the cartographical information, and has given the chance to a wide range of experts (and not only) to familiarize with maps and atlases, including ecological nature protection subjects.

For completeness of a picture it would be desirable to consider subjects of published and electronic Asian maps and atlases. In this list the first place, certainly, is taken by Russia with its rich cartographical traditions developed by schools of ecological and nature protection mapping. Analyzing conditions of ecological mapping [2], it is possible to say that at the turn of millennia a considerable break was outlined in the Russian ecological mapping. So, if till 1989 the ecological subjects made 14.0 % of all ecological nature protection cartographical information (basically these were text maps), after 1989 the part of ecological products increased to 51,4 %, and the part of nature protection maps decreased from 79,8 to 38.7 %. Thus the number of wildlife management maps increased only by 2.8 % (from 6.1 to 8.9 %).

The first Russian ecological maps gave the information of several kinds: pollution of territory and separate components of the nature, excess of maximum permissible norms of emissions of harmful substances in atmosphere and hydrosphere; quality of environment, i.e. danger (usefulness) level of natural and technogenic conditions for population vital functions; influence of an economy on environment and determination of ecological intensity degree; extent of environment influence on people's health, conditions of their life and work; level of ecological degradation of landscapes and their ability to self-restoration and self-regulation.

The first series of ecological nature protection maps of region were published in Russia. («Nature protection and wildlife management problems. A series of maps of natural resources, population and economy of Khabarovsk territory»; 12 maps; 1987), transport agency (Baikal-Amur railway; 3 maps; 1989), industrial region (Verkhne-Lensky TIC; 19 maps; 1988); ecological atlases were created: of Irkutsk (1997), Irkutsk region (1993), Surgut (2006), the Russian Federation (2002), etc.: separate

maps: of Krasnoyarsk Krai (1992), Primorsky Krai (1989-2000), the Far East (2002), the Amur region (1996).

For the last 10 years tens and even hundreds of environmental contamination maps have been placed in the Internet (including waters, atmosphere, soils), fauna protection of the Russian Federation on which, naturally, its Asian part is also shown. On the whole the condition of ecologic nature protection mapping of Russia is not indicative for other Asian countries. The contents of ecologic nature protection cartographical products of Russia gravitates to the European maps, instead of Asian, probably more because the first and basic schools of ecological mapping are concentrated in Moscow and St.-Petersburg.

In the former union republics the contents of ecological nature protection cartographical products is similar to Russian. For example, on three maps of Kazakhstan placed in the Internet, two have traditional ecological nature protection subjects (one of them is maps of districts division, the second is a complex map of the reasons of ecological disbalance occurrence and measures for its optimization), the third is a traditional map of ecological monitoring. The environmental contamination reasons are shown on maps of Georgia, Azerbaijan, Armenia. For example, a map «Problems of environment and safety in Armenia» shows mines and industrial enterprises harmfully influencing the environment; separate blocks present water problems, problems of soils degradation as well as nuclear stations, toxic waste of radioactive fuel, etc. By the way, in educational atlases of these countries, according to the Soviet tendencies, as a rule, 2-3 maps are devoted to protected territories, ecological condition of environment (basically its pollution) and to complex ecological nature protection division into districts of the state.

From the Post-Soviet Central Asian republics Uzbekistan has the highest achievements in the field of ecological mapping. In the late eighties - the beginning of 1990th National AS of Uzbekistan prepared the medical-ecological atlas of the country (1991) which had no analogues either in Russia, or in other states according to its contents. In 1992 «The ecological map of Uzbekistan» was published (1:1 000 000) based on complex landscape ecological nature protection division into districts

of territory, the estimation of the environment quality and its influence on population health was given. The map was supplemented by two insertions of the Aral sea dynamics [9]. Protected natural territories of Uzbekistan are represented in detail on the electronic map in the Internet. This map practically repeats the contents of the similar map placed in the geographical atlas of Uzbekistan (1999). This atlas includes, besides the mentioned map, 4 more ecological nature protection maps: two maps of ecological situation and two maps of ecological nature protection division into districts.

Approaches to ecological mapping in Tajikistan and Kirghizia differ cardinally from the previous countries- the contents of ecological maps very much remind the contents of the similar maps created in the countries of Southeast and Southwest Asia. The reason of it can be the fact that ecological mapping in these countries practically did not develop in Soviet times. So, from the three maps of Kyrgyzstan placed in the Internet, one shows displays ecological nature protection division into districts, including 200 ecological regions WWF. On the maps of Tajikistan ecological information (information on environmental contamination) is not presented at all, and basic contents are devoted to national reserves, national parks and especially protected territories.

On Turkish maps ecological and nature protection subjects are shown, as a rule, separately. So, from the three maps placed in the Internet one shows nature protection regions (with short characteristic of each of 14 regions), one shows ecological division into districts (according to vegetation types) and the third shows fire risk of the territory of the country.

On ecological sites of Saudi Arabia the ecological subjects are presented unilaterally - basically, it is the information on national parks and irrigated territories.

Practically the ecological nature protection subjects of the Indian maps have not changed for 30 years: agroecological division into districts, desertification, reserves and national parks.

For 20 years ecological mapping of Nepal has not undergone changes. As well as in 1985 the published maps of areas of Nepal (Butwal-Mustang and Nepalvani), the

modern Nepalese maps placed in the Internet in 2010 show especially protected territories and ecological areas of the country.

All ecological maps of Cambodia placed in the Internet show nature protection territories. Even on a map of the population two of five indicators are devoted to existing and prospective protected areas. Also exclusively nature protection territories are presented on maps of Vietnam, Pakistan, Laos, Butane (judging by a map «National Protected Areas and Biological Corridors of Bhutan», 14 national parks and ecological corridors of the country occupy more than 50 % of its territory). Similar subjects are on maps of Thailand – the information is presented by especially protected territories: national parks, reserves (including fish reserves), existing and prospective protected territories. The same subjects are presented on maps of Japan. Maps of water area pollution of the Pacific Ocean including a coastal zone of Japan appeared in the Internet after the accident on Fukushima.

The nature protection map of the Philippines devoted to protection of watersheds showing the underground waters degree of vulnerability («high», «average», «low»), and watersheds level of protection (for support of agriculture and quality of waters) is a little non-conventional according to its contents.

It would be desirable to consider ecological nature protection mapping of Iraq and its Kurdish territories separately. As it has already been mentioned, one of the first maps showing the irrigated land, mineral sources and sights, is placed in the atlas-directory of Iraq (1962). And only in 2009 the author's atlas of the Iraq Kurdish region territory («Atlas of Iraqi Kurdistan Region, Iraq and the World»; 138 p.) was published in which some maps are devoted to preservation of the environment, or, at least, they can be referred to such. These are maps of protected territories, earthquakes, Kurdish population genocide, territory of the chemical weapon use, etc. So far ecological nature protection mapping in Kurdistan is at the initial formation stage – the theory, a technique and methodology of ecological nature protection mapping of territory of the Iraq Kurdistan have not been developed, the statistical information base has not been prepared, there are no electronic databases, there are no published nature protection and/or ecological maps.

If we look in general at the conditions of ecological nature protection mapping we can notice that the majority of the cartographical products created in the Asian countries have the following features in common: a) prevalence of the information on especially protected territories and objects; b) practical absence of the information on environment conditions; c) accurate delimitation of the information on environmental contamination and the information on nature protection measures - as a rule, on one map both these groups of indicators are not presented simultaneously; d) representation of ecological division into districts by kinds and vegetation types, instead of its condition; e) absence of electronic maps and atlases and representation of the scanned maps with bad resolution in the Internet that considerably complicates map reading; f) absence of symbols unification both according to the form, and on colour, including for such objects as national parks, reserves, etc. For example, national parks in different countries are shown in all colours and every possible shadings, various geometrical figures – circles, triangles, squares (thus, after all there is a certain unification of graphic means on general geographic or topographic maps). For the last 5-7 years the number of ecological cartographical products presented in the electronic form have increased, though their share in total amount of the cartographical information does not exceed 4 %. Maps and atlases from the Internet considerably fill up the library of cartographical products of ecological nature protection subjects.

Conclusions. Proceeding from the aforesaid, it is possible to assume that a paramount problem of ecological nature protection mapping is formation of uniform methods and approaches to its realization, and first of all, to working out of the interstate theory of ecological nature protection mapping (mathematical basis, graphic means, information technologies, etc.) widely using possibilities of geoinformation technologies, GPS-technologies, remote sounding of the Earth, etc.

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ЭКОЛОГО-ПРИРОДООХРАННОЕ КАРТОГРАФИРОВАНИЕ В АЗИАТСКИХ СТРАНАХ: ИСТОРИЯ И ПЕРСПЕКТИВЫ

В статье проанализировано состояние эколого-природоохранного картографирования в странах Азии за период 1945-2010 гг. Определены тенденции и особенности данного направления картографирования. Рассмотрен опыт эколого-природоохранного картографирования в разных азиатских странах на примере размещенных в Интернете и опубликованных карт, серий карт и атласов данной тематики. Особое внимание уделено состоянию эколого-природоохранного картографирования территории Иракского Курдистана.

Ключевые слова: эколого-природоохранное картографирование, Иракский Курдистан, страны Азии, карта, атлас, экологические и природоохранные Интернет-карты.