

ATLAS MAPPING OF AGROCLIMATIC CONDITIONS  
AND RESOURCES OF MOUNTAINOUS COUNTRIES  
(ON THE PATTERN OF TERRITORY OF THE  
AZERBAIJAN REPUBLIC)

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**ABSTRACT**

The first most detailed climatic map of Azerbaijan was published in 1926. It was the beginning of publication the whole series of small and middle-scale maps. The series of climatic and agroclimatic maps were included into the common atlas of Azerbaijan published in 1949, 1963 and 1976, as well as Atlas of Thermal Balance of the Azerbaijan SSR (1977). The Agroclimatic Atlas of the Azerbaijan Republic (Baku, 1993) is the first important work devoted to agroclimatic conditions and resources of definite mountain territory. Scientific-methodical principles of its compiling and a number of original elaborations may be of great interest for many other mountainous countries. The scale of the most maps is 1:1 500 000. The background maps including space distribution of considering elements predominate in the atlas. For realization the possibilities of practical use many of them are accompanied by special tables, diagrams, graphs.

On its contents the atlas is a scientific-applied work. It includes 122 maps which has been grouped in 8 parts. The principal scientific-methodical direction of the atlas is that it is devoted to agroclimatic conditions and resources of mountain territory with its complica-

ted specific peculiarities.

## 1. AGROCLIMATIC CHARACTERISTICS OF AZERBAIJAN (13 maps)

The territory of Azerbaijan situated in the northern outlying districts of the subtropic belt is the rich with solar energy resources. In the Kür-Araz lowland the duration of solar radiance during a year fluctuates within 2200-2400 h, and annual amount of total photosynthetic active radiation exceeds 60-70 kc/cm<sup>2</sup>. The high thermal background in a considerable part of the territory combines with insufficient, here and there very scanty amount of precipitations. Almost the whole of Kür-Araz lowland, Absheron peninsula and Priaraz plain in a year obtain only 110-350 mm precipitations, and in mountain zone the amount of precipitations here and there reaches 1200-1500 mm. However, intrayearly distribution of the precipitations is so that during the rapid development of plants and intensified transpiration of their moisture providing sharply decreases. The amount of evaporation during April-October in arid regions varies mainly within 600-1000 mm.

## 2. THERMAL RESOURCES OF VEGETATION PERIOD (23 maps)

More than 60% of the territory of republic according to criterion suggested by us concerns to subtropic belt which is the fundament within the latitude of Azerbaijan. It ranges up to 400-800 m above sea level, then gradually passes on temperate belt. The upper limit of the temperate belt with the sum of active temperature above 10° about 1000-800° spreads to 2400-2800 m. The sums of temperatures above 10° are the highest in the Kür-Araz lowland and Priaraz plain (4000-4800°). All Kür-Araz lowland is characterized by enormous thermal potential. The

duration of vegetation period lasts 280-300 days. The most average annual amount of soil temperature ( $18^{\circ}$ ) falls on the central regions of Kür-Araz lowland, and zero isotherm falls in mountains at the altitude of 2800-3100 m.

### 3. CONDITIONS OF MOISTENING (8 maps)

Providing of the plants with moisture is considered with the use of indecies of moistening (Md) in regard of annual amount of precipitations to the sum of average daily importance the deficit of air moisture. The analysis of moistening maps shows that about 65% of the territory of Azerbaijan concerns to arid zone with existence of vast (Md 0,10) dry areas in the east and west of the Kür-Araz lowland, as well as in Priaraz plain of the Nakhichevan AR. The moist zone (Md 0,45) consists of not more than 15% of the territory and covers middle and high-altitude regions of the Major and Minor Caucasus and partially foothills of the Talysh. Three zones are distinguished according to dry-farming land (on Md for July-August). 1. Semiprovided dry-farming land with Md 0,15-0,25. The cereals are watered here and there. 2. Temperately provided dry-farming land with Md 0,25-0,43. The cereals are not watered. 3. Provided dry-farming land with Md 0,43-0,65. The amount of summer precipitations is quite enough for plants in regard to moisture.

### 4. CONDITIONS OF WINTERING AND DANGEROUS ATMOSPHERIC PHENOMENA OF THE COLD PERIOD (11 maps)

In a considerable part of the territory of republic up to the height of approximately 600 m in stable transition of air temperature through  $0^{\circ}$  is absent. But frosts lasting some days are observed from time to time. The ne-

gative temperature can damage and even destroy some long-term warmloving cultures. The appearing of snow cover at the foothills mainly coincides with zero isotherm. The most snow accumulation of 1-1,5 m takes place in ambush parts of altitude zones of the Major Caucasus. Unfavourable conditions the wintering of plants connected with uncharacteristic for the Azerbaijan light frosts and frosts (as a result the accumulation of cold air) are observed at the central part of the Kür-Araz plain and in the intermontane depressions.

#### 5. UNFAVOURABLE ATMOSPHERIC PHENOMENA OF WARM PERIOD (17 maps)

Unfavourable atmospheric phenomena the most characteristic for Azerbaijan - drought, dry wind and hail are considered in this part. The drought is considered as rainless period with prevailing of dry wind-arid and temperate arid weather. It develops the most strongly in the Nakhichevan AR, where in the Priaraz plain during June-September monthly 20-29 days occur arid. Appreciable damage to the agriculture of Azerbaijan brings hail. (The number of days in a year with hail at the mountains is more than 5, and in the plains 2-3 days).

#### 6. BIOCLIMATIC POTENTIAL (3 maps)

7 regions, differing on the climatic productivity, are distinguished. In natural conditions the moistening occupies the largest areas of the regions with low and very low productivity in lowland and plain territory, and the least - regions of very high productivity, covering only within the limits of two agroclimatic regions - Lenkaran-Astara and Zagatala-Gebele. In optimal moistening, by means of irrigation, the potential productivity of the

regions with low biological productivity considerably exceeds even the biological productivity of Lenkaran-Astara region. The potential possibility of climate may be expressed in the form of sums of residual-reserve temperature. They characterize the conditions and resources of heat of additional crop after harvesting of winter cereals and early vegetable. The need of winter wheat in heat exceeds the sums of temperature two times almost all of the plain and foothill regions up to 600 m. It means that in the presence of irrigation waters the heat is enough to get additional crops.

#### 7. PHENOLOGICAL MAPS (47 maps)

The groups of phenological maps on the main agricultural plants covering not only the areal of present ranges, but the regions of their possible industrial cultivation. 4 maps of climate seasons of a year, compiled on the basis of sliding criterion, suggested by A.J. Eyubov, are given.

#### 8. MAPS OF GENERAL AND PARTICULAR AGROCLIMATIC DIVISION INTO DISTRICTS (8 maps)

Maps of this part have been compiled on the basis of system of division into districts worked out by A.J. Eyubov for the mountain territory. The system of general agroclimatic division into districts combines the regional and typological principles. According to this system the territory of Azerbaijan enters the north part of the subtropic belt, within the limits of agroclimatic countries of the Caucasus and includes 6 agroclimatic regions, 6 subregions and 51 districts. On the basis of this system the maps of particular agroclimatic division into districts of main agricultural crops are compiled. The map of world agroclimatic analogues allows to judge about the possibilities of plant introduction.