



ENVIRONMENT AGENCY AUSTRIA **umweltbundesamt**^U

Perspectives of Smart City Development in Armenia: Smart City of Goris

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UNECE SMART CITY FOCAL POINT

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SMART CITY GORIS, ARMENIA

Strategic goals and objectives

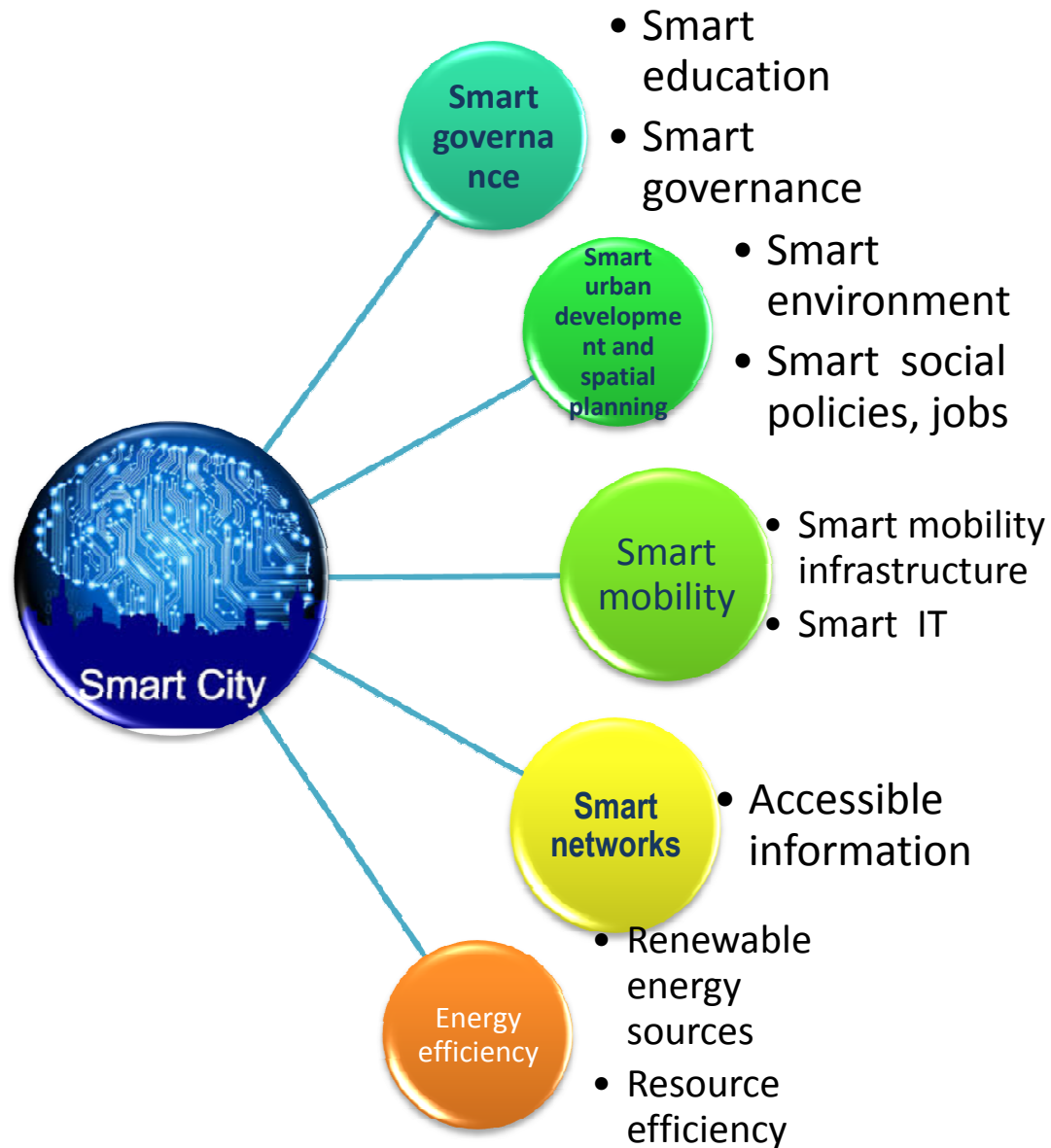
- Goris City in Syunik Region of Armenia, has been selected as a pilot for “Smart City” concept application in the frames of UNECE project “United Smart Cities”.
- Strategic goal of the proposed project promote sustainable urban development, especially in countries with transition economies and developing countries, through
 - analysis of practices and policies,
 - pilot activities,
 - exchange of experiences and best practices,
 - networking and capacity building.
- The project will help to scale up the European experiences of smart cities to countries outside of the EU.
- The project objective is to strengthen the capacities of national and local authorities in the project region for the development and implementation of national and local policies for sustainable urban development.



Main idea: Smart cities

- The comprehensive “smart cities” initiative aims at improving key dimensions of cities:
- urban environment (buildings, transportation, water, waste, energy services, and information and communications technology);
- governance (inter-sectorial cooperation, cooperation between national, regional and local authorities, other stakeholders; establishment of multi-stakeholder platforms); support to networking with other cities;
- social capital (education, social and gender equality);
- economic conditions (poverty reduction and employment generation);
- citizens’ experience
- urban tourism

The main components of Smart city approach



Thematic components of Smart City

- **Economy**
 - Economic growth
 - Production and consumption
- **Environment**
 - Air, environmental conditions
 - Disaster risks
 - Land and biodiversity
 - Drinking water
- **Society**
 - Social issues
 - Health
 - Education
 - Demography

Spatial planning and green urban development

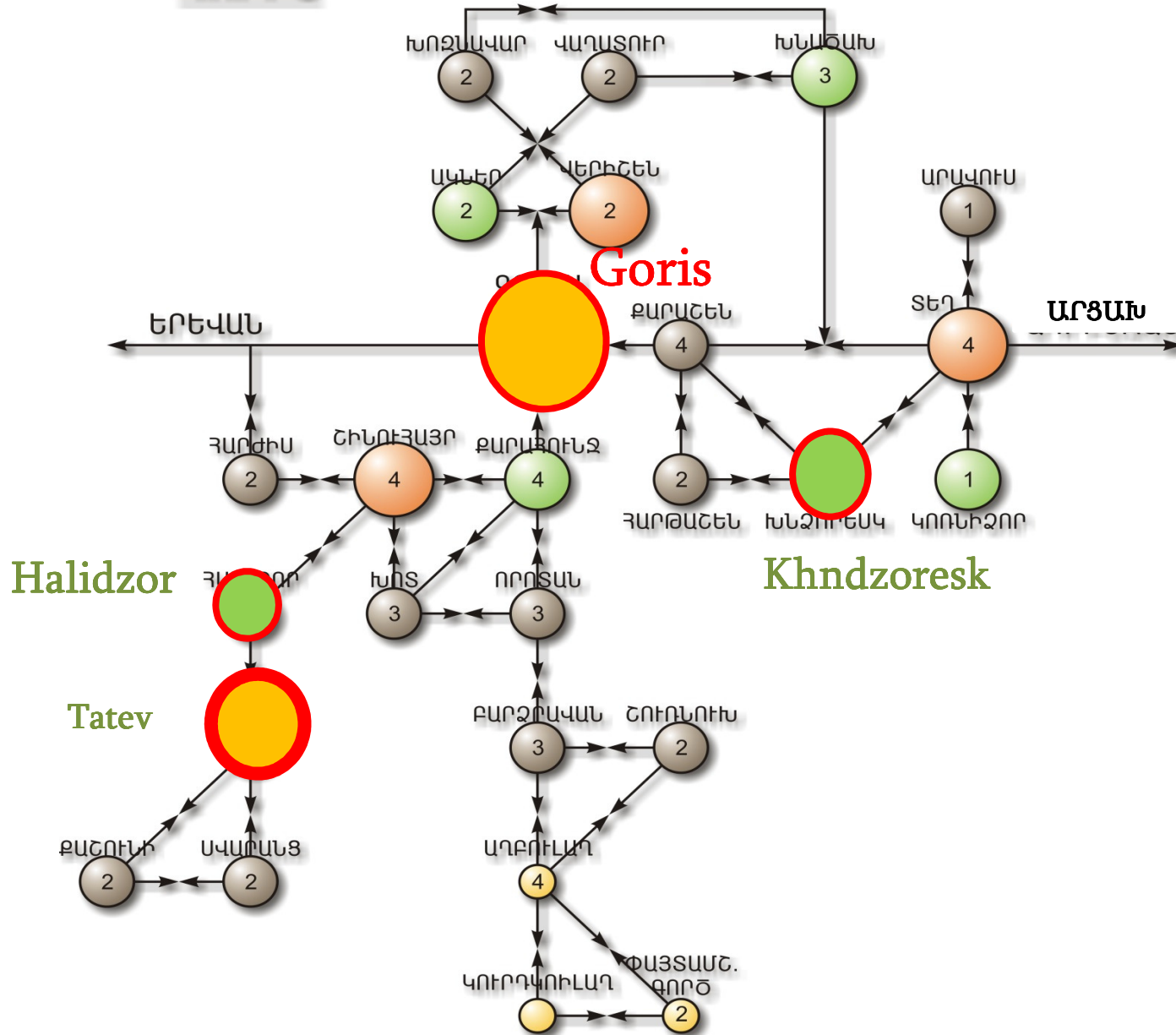
- Environmental degradation increases antropogenic pressure on natural landscapes, cities and population should not only adapt, but make an effort to decrease the pressure and impact of climate change, pollution, degradation of natural landscapes
- Essential precondition for lasting and sustainable development of cities is harmonious coexistence of natural and man-made environments with the complementary combination of residence, work and leisure providing opportunities for favorable and safe habitat – green, smart, resilient, comfortable.
- The factors ensuring sustainability of cities include systematic integration of urban spatial planning, architecture, industry, energy and transport, as well as almost all spheres of human livelihoods supporting life, work and leisure of citizens
- Spatial planning in its national, regional and local levels of urban development planning, sustainable land use and zoning of settlements is one of the key elements in creation of prerequisites for Smart and sustainable cities
- One the effective solutions – Smart city indicators and integrated development strategy based on participatory approach and co-operation of government, civil society, business and citizens

Why Goris was suggested as a pilot?

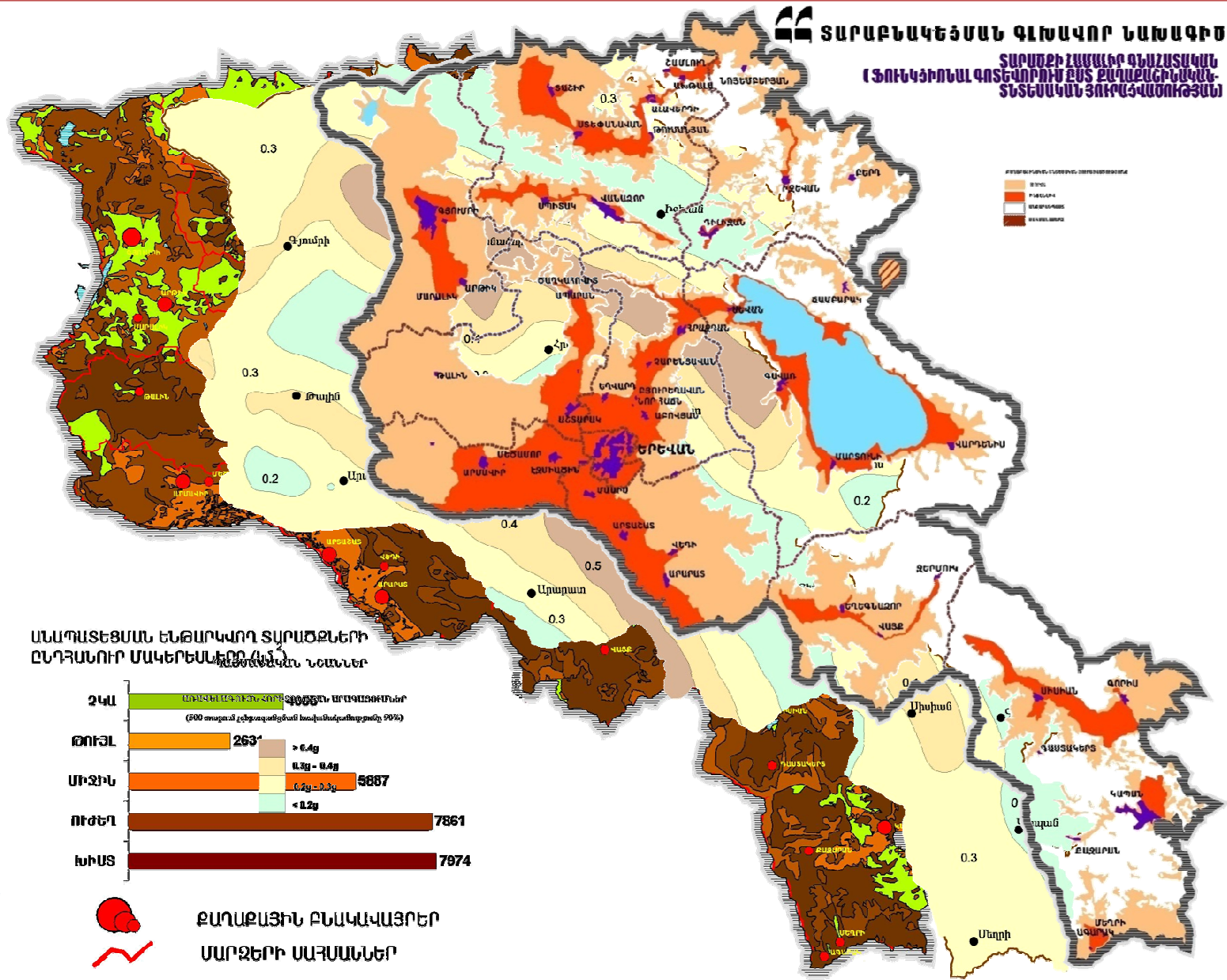
- Distance from Yerevan-250 km, population-25.46 thous. people
- Good climatic conditions and rich natural landscape
- Availability of SPAs in the region- **Black Lake** 12 km Northern direction , **Shikahogh reserve** -southern location, potential for tourism development and service industry
- Availability of **mineral waters** in the region -7 km from the city
- Availability of **spring waters** in the region-501.8 thous m 3/day
- Goris creates an atmosphere where local people and passengers could relate to each other activities
- Existence of infrastructure, strategic geographical location
- Some of the most important Armenian medieval universities and cultural centers have been located near Goris (**Tatev monastery**), ancient scientific and educational center
- Rich historical and cultural heritage (**architectural-historical monuments** in the region-503, **architectural-historical monuments** in the community -20)
- Availability of human resources
- Support of community and local government to the idea of Smart city development

Goris as a center for polycentric settling system for the surrounding rural settlements

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The seismic zoning scheme suggests division of the country into 0,2g, 0,3g, 0,4g and 0,5 maximum acceleration zones: favorable zones for utilization are outlined



Urban economic utilization

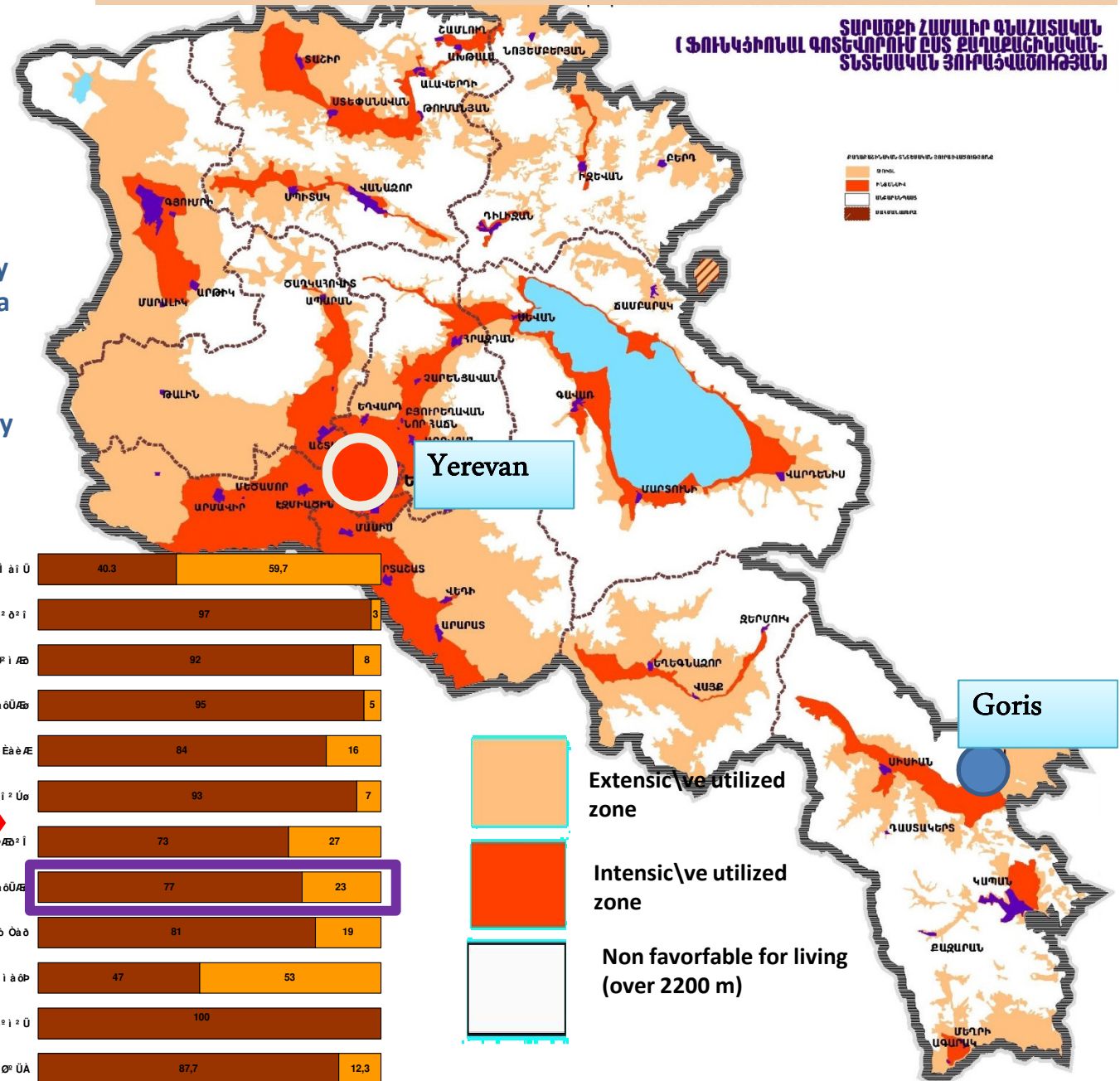
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89.6 % of urban settlements are located in the intensive utilized zone

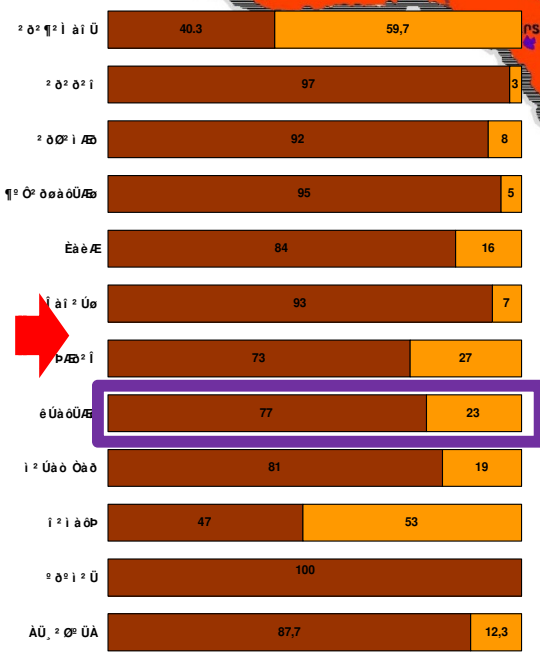
10.4 % of urban settlements are located in the extensive utilized zone

The intensive utilized zones occupy 18.2 % of the total area of Armenia
88.6% of the total population is concentrated here

The extensive utilized zones occupy -11.4 %- 11.4 % of the total population is concentrated here



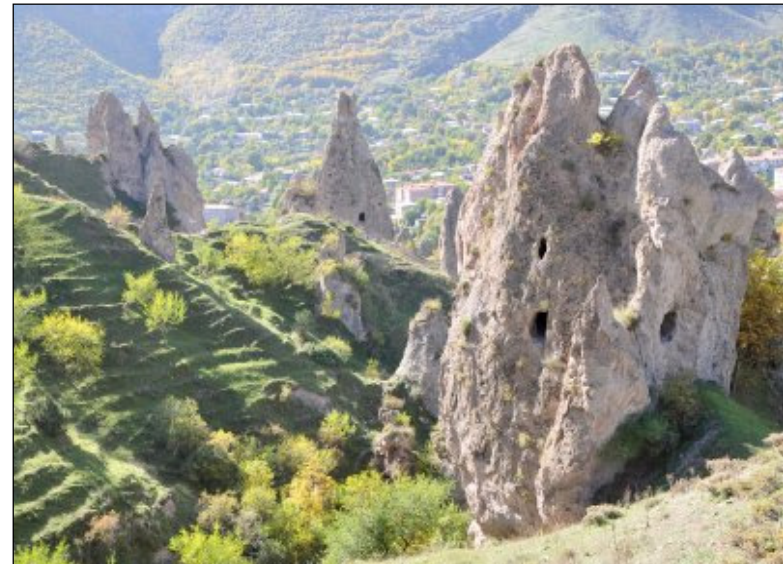
RA population location in different utilization zones



Goris city

Goris is located in the southern region of Armenia – Syunik, bordering Iran . The city is one of the first grid-built layout in Armenia, with unique regional style of stone architecture. Located along the river in a valley surrounded by mountains, Goris is the last major town in Armenia for travelers to [Kapan](#) or [Meghri](#), and further to [Iran](#).

The vicinity of this beautiful city is abundant with extraordinary towers, fortresses, pyramids, caves and other miraculous formations that stun visitors with their unique beauty. The entire view seems to be created by an artist who had a perfect feel for colors, taste and hues and excellent imagination and fantasy.



Goris historical overview

The city of Goris was founded in the Syunik , in Haband province, on the left bank of the Vararakn river, in Dzagedzor valley. The city is surrounded by plateau and mountain areas, is located in moderate warm climatic zone. Zangezur (old name of the region) was inhabited from the ancient times. According to the 3 thousand years old evidence the Syunik Dzagik ancestor called by his name Dzagedzor or Zangezour.

The Gorisians mainly were busy with silk spinning, carpet and tanning industry, stone, copper, silver, soap production and etc.

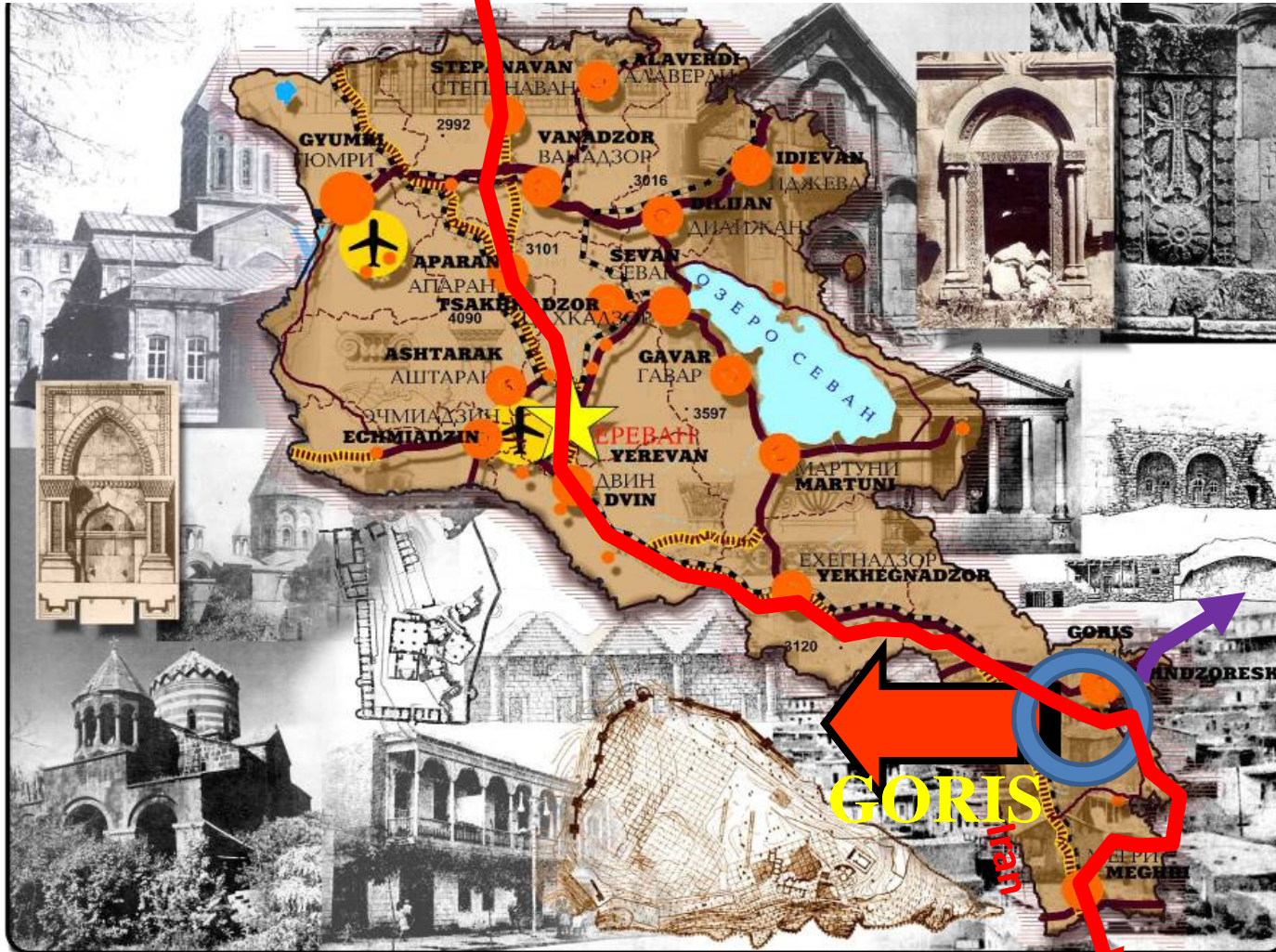
In the middle of the XIX century according to the narrator Stepanos Jalalyan Goris has had 150 houses (about 1500 inhabitants). The settlement territory was like a huge amphitheater consisting of ravines and hills (about 1 km diameter) almost in the center of which the citadel of Dzagedzor is located.



The role of Goris in settlement system

Integrated settling system of the region and rural settlements relations with the regional center-city of GORIS

Georgia



OF RA CITIES

LEGEND

- CITIES WITH HISTORICAL INHERITANCE
- PERSPECTIVE HIGHWAYS
- AUTOMOBILE ROADS
- RAILWAYS
- LAKES AND WATER SURFACES
- RIVERS
- HEIGHT MARKS
- CAPITAL OF RA
- CITIES
- STATE BOUNDARY
- MARZES BOUNDARIES
- AIRPORTS



Climate and environment

- Climate is temperate, with mild winters. The annual average temperature is 8.4°C. The annual temperature amplitude is 16.9°C. Minimum temperature is –27°C, and the absolute maximum is 33°C.
- Annual average absolute air humidity is 8.6 GPa, and the relative humidity is 69%. In may decrease to 39% at summer midday's and for 7-8 days in a year in may decline oven below 30%. The annual average precipitations are 709mm, and the maximum rate is observed in May, when it is 104mm.

Challenges and recommended measures

- Rivers pollution: surface waters and sewage falling into rivers, absence of waste-water treatment plant/facility
- For the city center and whole territory - floods from the river Vararakn – construction of anti-flood facilities is necessary (flood prevention).
- The transport communication (between the flat part and sloping as well as the archaeological valuable grotto settlements constructions) is not solved. It is necessary to regulate the street net, building rope-ways, elevators and pedestrian roads,
- Two transit roads are passing through the city territory. The first one (Yerevan-Goris-Stepanakert) is passing through northern edge and the second one (Goris-Kapan) is passing through center. The sanitation zones are not maintained. It is advisable to remove these roads from the city territory (to free the center from transport noise and pollution) and the existing road turn into town street, establishing a green zone in the area of sanitation.

Industrial development and business

Industrial development and business in Goris are targeted to

- Energy production,
 - Agricultural processing and food production,
 - Construction materials – stone production, produce of construction materials
 - Small holder businesses, including food shops, markets,
 - Tourism and tourist services
- Challenges and opportunities: Lack of investments, support to small and medium businesses, special measures and policies strengthening co-operation between local government, civil society, business,
 - Economic investment policy and support to industry development – based on participatory approach
 - Opportunities to support local businesses using resource efficiency and cleaner production to promote green business development, additional jobs, smart income generation opportunities using water recycling, energy efficiency, good housekeeping

Potential for agriculture and food production, farming

- The privatized amount of lands equals to 668.68 hectares, sown grain cereal crops like wheat, barley and vegetable crops with good dislocation for crop production and cattle breeding,
- Agriculture – as one of the most promising areas for sustainable development
- Community owned lands - 3111.09 hectares, from which arable lands 328.70 ha, hayways 26.65 ha, pastures 2118.74 ha, other types 637 ha:
- The city surrounding forests are rich in berries variety of potential agricultural, forest areas for using forest by-products for by farmers and small and medium producers
- **Challenges: low level of investments, under-developed value chain, isolated location, low level of processing/production and processing technologies**

Towards Smart City Goris: Implementation

- Pre-assessment mission by UNECE and local experts 9-12 February 2015, Goris – assessment of current status, introduction of Smart city concept to Goris community and decision-makers, development of Pyramid of challenges and suggestive solutions
- Development of Pyramid of ideas together with Goris citizens, verification of Smart city indicator list/amendments
- Goris Smart City Profile – collection of data (REC C UNECE Ministry of Urban Development, experts)
- Strategic framework and collection of existing legislative database, legal and strategic documents
- Ministry of Urban Development, Goris Municipality, UNECE, UNDP, REC Caucasus – signature of official MOU on Smart city - 9 th of april 2015թ, Yerevan

Preliminary Smart city indicators: Environment

Low relevance Indicators

- Ambient concentrations of air pollutants in urban areas - Air pollutants are monitored in neighboring cities, It can be assumed that air pollution is not a major problem, due to the lack of heavy industry and low traffic
- Total greenhouse gas emissions from transport sector – Greenhouse gas accounts are calculated only on a national basis
- Soil Sealing (low or non permeable layers) per capita - Goris population was shrinking in recent years and land take was not an issue.

Medium relevance indicators

- DRR – prevention and mitigation - Flooding occurs frequently in the city area and has an impact on the topography of the city, existing flood control facility is in bad condition
- Percentage of protected natural area – no protected areas within the city boundaries
- Water consumption per capita: Water consumption was referred to 100 lit. per capita and day.

High relevance indicators

- Percentage of households connected to piped water - Access to safe water is a millenium development goal and is fulfilled in the case of Goris
- Tourism intensity: Value of tourism & employment in the sector tourism – high potential
- Green areas per capita - T here is a clear lack if public green areas in Goris
- **Recommended measures on climate and DRR: reduce vulnerability to natural /man-made disasters, flooding, earthquakes** - Disaster prevention - Life-saving and mitigation instruments
- **Recommended measures on environment:** expansion of public green areas, waste management, reduction of losses from water use

Preliminary Smart city indicators: Social and Economy/prosperity/technology innovation

Recommended high potential measures for Society sector

- Decentralization of national investments (social equity), Attraction of foreign investments (employment), Facilitate entrepreneurship , opening of new businesses, Construction of social houses, Creation of a proper framework for growth

High relevance indicators:

- Housing price and rent-to-income- about 60 % (leading up to 100 % in the winter for some households caused by energy costs) and estimated by participants of city
- Number of SME per 1000 capita: About 60 registered SMEs per 1000 capita
- Unemployment of young people: 38,3 % share of unemployed inhabitants younger than 35 years of all inhabitants able to work and younger than 35 years

Recommended measures for sector Economy

- Technology investment program to improve infrastructure and environment (high)
- Tourism and culture information and promotion program (high)
- Support and investments to science based industry

Recommended Measures for Technology investment to improve infrastructure and environment

- Biological sewage plant/waste water facility for the city,
- Solid waste management and recycling (with possibility to use resource efficiency and clean production)
- Flood protection
- Energy efficiency and renewable energy use for public and private buildings

Thank you for attention

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