

## An Environmental Study of Azerbaijan in the Late Bronze-Early Iron Age Based on Archaeological Data

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Received date: January 17, 2016; Accepted date: January 24, 2017; Published date: January 30, 2017

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### Abstract

What occurs in the Iron Age clearly testifies to man's relief from the burden of finding solutions to the problems of food, housing and natural defenses. In this age, agriculture is carried out by the necessary tools and different irrigation systems. Finding various products becomes possible, and architecture according to the geographical conditions creates its own particular technical rules and requirements. This era, spanning from 1500 BC to 500 BC, has been identified and explored based on environmental data and systematic excavations. The main feature of the Azerbaijan and its neighboring lands have created many concentrated and dispersed areas due to their various species of fauna and flora identified through archaeological excavations, their climatic adaptability, their abundance in water resources and many other favorable environmental conditions. These geographical capacities are among the influential factors in the structure of the Iron Age. What is important is that by analyzing the data related to archaeobotany, zooarchaeology, palynology and soil study and investigating the flora and fauna symbols on pottery surfaces and the manufactured equipment in the form of animals, it is possible to specify the climate of Azerbaijan in the North West of Iran during that era in Iran's history. By examining and analyzing these samples, it can be said that in the Iron Age, Azerbaijan had a mild and favorable climate for people, animals and plants.

**Keywords:** Azerbaijan; Iron Age; Environment; Interdisciplinary science

### Introduction

Regardless of following of fatalism, the appropriate climate and geographical conditions are doubtlessly considered as the most original factors for concentration and growth of human communities that have already tempted humans in inhabitation- whether by cave-dwelling or as fixed settlement. Azerbaijan region is one of the lands which have prepared the natural ground needed for entertainment of human communities. Mounts and heights, plains with fertile lands, flowing rivers, and adequate trees are deemed as some the needed elements for this region and therefore it is natural for us to think this center has been assumed as place for accumulation of human groups.

This preamble can be probably deemed as a subgroup of environmental archeology. The environmental archeology is the modern product of processional archeology that can be assumed as a technique for environmental recognition of previous eras and study on economic, political, and cultural background of human through analysis and relationship among environment and culture and humans. In fact, environmental archeology analyzes relationship among human and natural environment over the time. Since the end of 1960s, this trend noticeably grew mainly due to encouraging for modern archeology and with reliance on theory of systems and ecological archeology. The environment is considered as origin and base and training of physical and perceptual effects of humans in environmental archeology and humans are assumed as the main factor for transformation of their surrounding environment. Environmental

archeology studies on development trend and interaction in this regard. It can be implied that the main objective of environmental archeology is to identify features and processes of biophysical environment in relation with social- economic systems. The concentrated human- environment relationship system reflects human activities and establishment pattern. Following to development of archeology, archeologists acquire maximum data from the least possible amount of materials. This case is led to over-production of information in all dimensions. In light of advent of modern techniques and scientific analyses, one can extract maximum possible information from each of materials remained from the past. Palynology and considering plant and animal and soil data became scientific with development of environmental archeology. This introduction highlights the effect of environment in training of latent talents of human so for better perception we should primarily define environment. Environment includes water, air, soil, natural resources, plants, animals, human, and their mutual relations. Term 'environment' is obviously derived from Anglo-Saxon scientific ecology. Albert Demangeon in France employed this term as an equivalent for geographical environment and later Pierre George utilized it in geography glossary. In Anglo-Saxon literature, above term synchronously denotes physical environment including water, climate, soil, unevenness, vegetation (flora), and animals as a system [1]. As it mentioned, in order to analyze effective factor on formation and developing of human habitats, we explore geographic coordinates, geology, topography, climate, and water supplies, soil, vegetation, and land gradient that is essential for project of studies relating to habitats [2].

Environment also revealed its effect in archeological field. By focus on logical positivism such as theory, hypothesis, and modeling, modernist archeologist looked for general rules in human's behavior at the second half of twentieth century. The comprehensive study on human's behavior led to formation of interdisciplinary sciences. Many techniques have been utilized in this science to achieve some clues from foods of previous people and identification of environment. All these clues were extracted from animal and plant residues and existing soil in human habitats which are studied respectively by zoo-archeologists and archaeobotanist. Inter alia, environmental archeology is one of the foremost sciences that can reconstruct human and environment relationship. Other branch of archeological sciences such as social, political, and economic archeology only emphasize in human's role while overlooked consequences and effects of environment on human culture but environmental archeology covers a wide group of specialized archeological studies that analyze interactions among human and environment.

### Geographical Scope the Study Area

With surface area of 122635.137 km<sup>2</sup>, Azerbaijan region (Figure 1) is spread within coordinates of 35-39.8° (Northern latitude) and 44.12-49.9° of eastern longitude. In terms of geopolitics and relative situation, Armenia and Azerbaijan Republic were located at Northern borders and Turkey and Iraq are also placed at the west of this region. This region is at neighborhood from south, southeast, and east with Kurdistan, Hamedan, Qazvin, and Gilan province respectively. This region has lonely formed an important cultural and geographical field in prehistoric era and it is composed of three water basins of Urmia Lake and Caspian Sea. Azerbaijan comprises of Northwestern part of Iran and it is assumed as a natural shield that the wall of political and natural border of this region covers snowy Ağrı Range from Northwest and west and Aras River at North and Talesh Mountains at the East. The Qaradagh and Qoshadagh and Sabalan dispersed and irregular mountains are placed at central North side and Qaflankoooh at east, and Sahand Mount is situated at the center of this region [3].

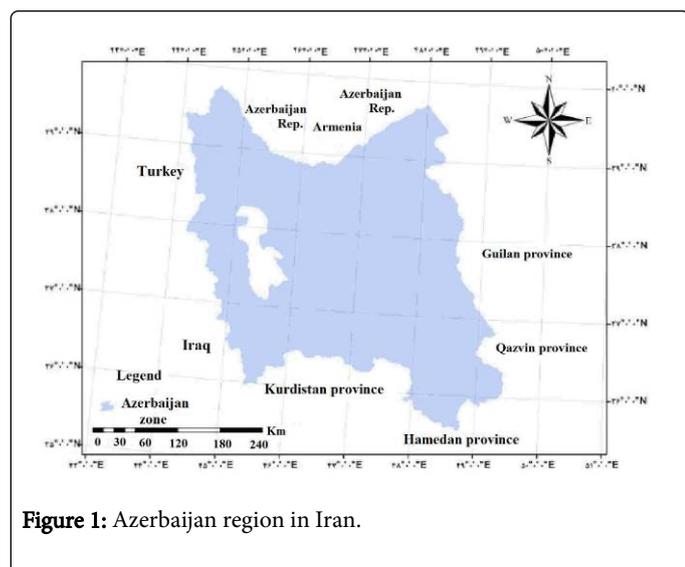


Figure 1: Azerbaijan region in Iran.

Azerbaijan is high-rise and mountainous land that is elongated from the Northwest to Zagros Range and with 480-500 km from the Southeast and as a result of prehistoric volcanoes and later some fissures and parallel stratifications and ground breaks were created in

this area with several valleys at different lengths and widths on almost 1700 m heights. Some ranches were spread at wide piedmonts of aforesaid ranges that include former remainders of massive forests of oak, walnut, wild almond, and pistachia atlantica (Chatan Ghoosh or wild pistachio). Grape and fig and sore pomegranate grow lower than this area in continuous valleys. Various plants are cultivated here such as cotton, castor, wheat, millet, tobacco, and estival crops. Azerbaijan environment has been acquired by breeding various animal and plant species in archeological excavations. Focusing on climatic adaptation, presence of suitable temperature and a lot of water supplies are some of appropriate climatic conditions which are led to concentration and dispersion of many areas where these geographical potentials act as effective factors in change of cultural structure at Iron Age and Bronze Age. Overall, environment prepare platform for economic and social systems reflected in living activities and establishment patterns. Life of various types of animals under aegis of abundant climate has motivated artists during these eras to convey their environment onto pottery designs, figurines, and metallic artifacts. In addition to aesthetic aspects, these images include ecologic and structural conditions of this region. This fertile geography that is saturated from any technique and art reveals its outcomes in household structures, storerooms, metallic and pottery vessels, regular and parallel designs and other arts. Development of areas belong to Iron Age discloses ecologic advantages of this field in compliance with economic methods produced at this period. Identification of natural features of a region during past times and analysis of geographic and climatic developments are considered as important points in this study. This issue indicates importance of geography and link between two sciences of archeology and geography.

### Environment of the Region at Iron Age Based on Archeological Data

Formation of powerful governments in Azerbaijan is a conjecture which is near to reality at this period. What it deemed as comprehensible, is artistic and architectural correlation at first millennium that reveals status of Northwest of Iran at the level of formation of general union. Comparison of hand-made artifacts of people without writing script found in Areas of Hasanlu, Yariq, and Shahar Yeri etc., along with Elamite technical and artistic achievements that included perfect writing script may ignore presence of technical and cultural distance between them and in some cases it can be said that presentation of thoughtful practice in local environments that lack writing system is much stronger than areas with writing script.

1. Haftavan Tepe
2. Kordlar Tepe
3. Bayazid
4. Tepe Qalaichi
5. Aqrab Tepe
6. Jeyran Tepe
7. Hasnalu
8. Rabat
9. Bastam
10. Ismaeil Aqa
11. Goy Tpe

12. Khorram Abad

13. Shahar Yeri



Figure 2: Iron Age settlements in Azerbaijan (Google Earth).

The settlements have been more spread in Azerbaijan at Iron Age than previous period. This issue signifies rise of population. With respect to rich metal mines and presence of utilities for making tools and the existing population as applicant for the produced tools and suitable environmental conditions caused metalwork job to become as a professional field. But in the meantime what it can make possible the result of study and assay on environment of this region, is analysis on ecological, plant, and animal resources.



Figure 3: Urartian pottery, Haftavan Tepe IV.

It is a matter of fact that such an approach will be heuristic that has been taken in areas where botanical and zoological studies are done; however, unfortunately there are only few well-known regions in Azerbaijan (Figure 2) and in other settlements our experiments have only led us to sounding about identity of bones and dealing with designs on potteries thereby we can find climate of this region at above age of modernity.

We start the current research from Haftavan Tepe region. Haftavan Tepe IV coincided with Hasanlu IV indicates Iron Age II where animal bones of sheep and goat were embedded in tomb of inhabitants of this region [4].

Regarding explored pottery pieces in Haftavan Tepe by Charles Burney, he introduces images of horse, birds, and plants on a platform with various and harmonic colors in Slamas Plain similar to Age of Bronze as a susceptible environment both in terms of security and climatic aspects (Figures 3 and 4).



Figure 4: Urartian pottery, Haftavan Tepe III.

Kordlar Tepe is another region that reveals climatic orders. Kordlar Tepe is located at the west of Urmia Lake and it has been excavated by Andre Lippert during (1972-1974). The bone residues, which have been studied by experts, have been dated for the end of 2nd millennium BC. About 97% of needed animal protein for community was provided by meat and fat of domestic animals in this region and only 3% of studied bones belonged to wild animals. Domestic animals were sheep (50%), cow (20%), goat (10%), dog (8%), mule (2%), and horse (5%) and pig (2%) [5]. Alternately pottery vessels found in this region have been also influenced in improvement of our job. Drawing of the existing animals in ecologic circle of region (Figure 5) denotes climatic facilities and needed platform for growth and continuity of life. While these animals were drawn exaggeratingly with long horns or legs, cultural comfort and security backgrounds represent organized environment of this region in proposing artistic expressions.

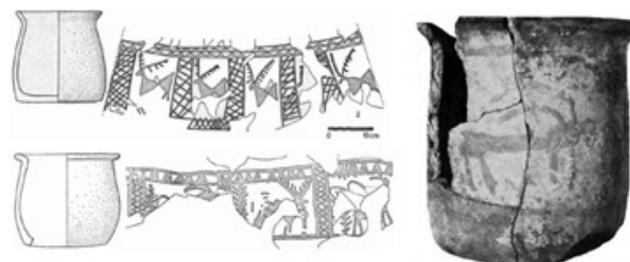


Figure 5: Pottery painted with animal figures.

Bayazid Tomb in Naghadeh city is one of the areas in verdant Sulduz Plain that is located 1435 m higher than sea level of free waters and it is directly 18 km distant from archeological Hasanlu Region at Southwest. The artifacts that have been discovered randomly in this region belong to Iron Age I and II. Seals are some of artifacts found in Bayazid site (Figure 6). One of these seals includes design of a deer with long horns drawn at both side of life tree while eating its leaves. On design of another cylindrical seal, an animal moves toward an object like a cross. Similarly, there were charred seeds of grains and small and broken bones among some of pottery vessels particularly bowl and ewer. The pottery rhyton made in form of ram (Figure 7) reflects susceptible environment for breeding this type of animal in Naghadeh at Iron Age [6].



Figure 6: Cylinder seal with animal and herbal figure.



Figure 7: Animal Raytheon in Bayazid site.

Tepe Qalaichi in Bukan city belongs to Iron Age III including a cultural class in which three construction layers have been identified. This region is situated 8 km distant from Northeast of Bukan and with coordinates of (longitude: 36°34'21.6") and (latitude: 46°16'52.2") and 1539 m higher than free sea level. Ia layer is the highest cultural level in Tepe Qalaichi settlement that Yaghmaei revealed its architecture at center of hill including a few small rooms with stratified walls where surfaces of their internal body and floor has been decorated by some paintings with subjects of plant, geometry, animal, and human.



Figure 8: Animal motifs on Qalaichi brick.

Bricks are the most frequent cultural findings in this region. Plant subjects comprise of octagonal designs with circular core that has been designed with plain flowers or each of them placed inside of black color lines on circumferential circles in black color on one or two sides adjacent to bricks together. Another plant design is also visible including some part of branch and leaf and bud of pomegranate flower were arranged together on surface of a broken brick among octagonal bricks and flowers. Animal and human and legendary designs (Figure

8) have been drawn independently on surface of bricks. Image of a white colored ox with some small feathers in lemon color and folded tail, profile of body and full view of horny head are some of items relating to suitable climate of this region in breeding of animal varieties [7].

A monument with temple-like architecture was discovered at sixth phase of excavations in Tepe Qalaichi region among wastes resulting from accumulation of animal bone residues at the center of this area and adjacent to it where this waste was found in a well with about 6 m depth in which bone residues of consumed animals were thrown away and accumulated inside it by inhabitants of Tepe Qalaichi. It was characterized by study on the given residues that major part of these remainders belonged to herbivorous domestic animals from Bovidae family including cow, sheep, and goat [8]. Aqrab Tepe is one of the regions in Sulduz plain at Iron Age locating at Southwest of Hasanlu that is situated on the same level with Hasanlu IIIB and it covers period of 7th century BC (Figure 9).



Figure 9: Seal sign on Aqrab Tepe pottery.

A pottery piece in pea-brownish color was found that it belongs to a coarse and seemingly hand-made vat on which two designs were sealed and both of them indicates image of a horned animal while marching with lifted tail [9]. Whereas animal boney artifacts and the related accessories to specific profession were accumulated on the floor of these rooms thus according to attitude of Muscarella they were certainly related to kitchen or storage room. Animal bones were found on the floor of all rooms 4, 2, B1. Rather than these items, handle of iron axe with a hole is seen as one of wooden objects which have been discovered but Muscarella does not determine its type. Similarly, a bronze bracelet was found that both sides of it ended to head of snake among CI-accumulations. Rather than these artifacts, remainders of half-burned grains were discovered among these soils. While conducting of interdisciplinary experiments was not possible in Aqrab Tepe region, based on the above findings, it has been possible to identify ecologic territory of southern banks of Urmia Lake as well. Jeyran Tepe grave is located 2 km distant from east of Jizlan Dasht Valley and 3 km from Dram area and 20 km from Ab-Bar city at center of Upper Tarom County and 475 m higher than sea level. This grave represents Iron Age with geographic coordinates (Northern latitude: 37°00'32.2") and (Eastern longitude: 48°47'36.6") at Southern side along with Qizil Uzan River. Establishment of olive garden in some parts of this region caused sounding operations to be done headed by Behnam Ghanbari in 2011. At the second phase of exploration done by this group in Grave No 3, a pottery bowl was found in which animal bones were embedded and so far no zoo-archeological studies have been yet conducted to determine gender of them [10]. What it can be

mentioned about ecologic issues and utilities in this region is to find a pottery vessel in which there were residues of animal bones. Likewise, they have utilized rubbles in different sizes found in Qizil Uzan River for construction of tombs and to cover the graves. A wooden object has been found on chest of dead body in trench No 1 from Grave No 2 as well and it seems to be a comb. The hand-made objects with semi-precious stones indicate extraction of given stones from surrounding sources at this region (Figure 10).

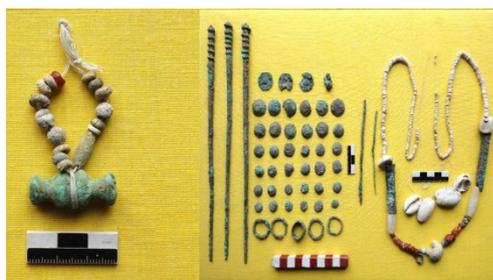


Figure 10: Semi-precious stones in Jeyran Tepe.

Taham Castle Tepe (Zanjan) is located in 18 km distant from Northwest of Zanjan city. This area was used as grave at Iron Age [11]. However, no artifact was found in this region based on which one can reconstruct Zanjan region at Iron Age. Certainly, plants include the best parameters for ecological changes and climatic conditions and transformations. It can be implied generally that the first information about modern plants in Azerbaijan was gathered by foreign tourists

and diplomats. Palynology is one of branches of archaeobotany and if it is settled in geological region without gas, it is not rotten and it can be recognized and analyzed by means of microscope. Palynology is the science for study on spores, holes, and amount of burned particles and most importantly these are pollens of fossil and semi-fossil produced in seed-generating plants in great amount [12]. The most useful information is acquired about acquaintance with archeological sites through samples of pollens and greater parts of plants (especially seeds) and also objects that are relevant collection and breeding and use of human from the plants. One can draw a relatively clear and accurate image of regional plants and their changes over the time by means of pollen samples. The tiny seeds have hard cover that is resistant against synthesis but pollens are destroyed finally as a result of frequently dry and humid conditions of soil and for this reason, very small amount of pollens may be generally extracted from archeological sites. Palynology studies have provided valuable information about forest vegetation in Region of Urmia Lake. Dispersion of pollen particles locating at lower layers of Urmia Lake indicates that about 9 thousand years ago, there were very few numbers of trees around this lake (including in Sulduz Valley). Following to rise of temperature and humidity at the end of last Ice Age, pollens of wild pistachio (*Pistacia*), *Betula* tree, and finally Pine (*Pinus*) and oak tree (*Quercas*) were accumulated in this region. At the end of Pleistocene Epoch, we may witness rise of grain species and Poaceae pollens in lower layers of Basin of Urmia Lake. These plants are produced not only by breeding and wild barley and wheat, by other group of Poaceae [13]. The remainders such as seed and stem and woods of these plants are visible with unaided eye.

Species	Genus	Cases of use
Acer	Maple	Construction beams, home furniture, club bar, engraved objects
Buxus	<i>Euonymus</i>	Home furniture, weapon bar, engraved objects
Cedrus	Lebanese cypress	
Crataegus	Crataegus hawthorn	Bowl
Cypressus	Cypress	
Eronymus	Spindle tree	Statue
Fraxinus	Common ash	Home furniture
Juglans	Walnut tree	Home furniture
Juniperus	Juniper	Engraved objects
Malus or Pyrus	Apple or pear tree	Club bar
Platanus	Plane tree	Engraved objects
Populus	Poplar	Column, home furniture, engraved objects
Prunus	Almond, peach	Home furniture
Ulmus	Elm	Home furniture, javelin bar

Table 1: Applied trees in Hasanlu IV.

Macroscopic remainders of plants that founded in archeological sites are usually half-burned because often as a result of conditions governing over soil in these sites, the burned samples are eroded.

Sometimes, a great amount of seeds and parts of plants is found in concentration form inside soil that is due to fire and or charring of them during cooking food. Meanwhile, Tepe Hasanlu is certainly

deemed as familiarity gate for Iron Age in Azerbaijan. Several studies that have been conducted regarding this site are considered as the greatest excavations in the Middle East.

Fortunately, the amount of our information is adequately high from plant and animal data in this archeological site thereby the environment of this region can be reconstructed. Types of various trees have been identified by the given studies (Table 1).

Wood is material produced in the nature which may be used as suitable nutrient for growth of fungi and biologic destructive agents because of content of carbon hydrates in the given structure and this will reduce stability of this material in wooden structures and uses. Euonymus (boxwood) is a type of the woods identified in Tepe Hasanlu. A bronze club head with a handle made of box tree wood was found in great hall of burned building II. The pieces of an object that was made of euonymus wood found in burned building VII. These pieces might be related to home furniture. Box tree is a sciophilous species and specific to marine climate. The best place for growing of this tree is at -20 to 400 m higher than sea level but it is also visible up to 1200 m height [14]. The various species of euonymus tree (*Buxaceae*) have spread widely in Eurasia and North America and due to contents of steroidal alkaloids; they are widely used with many benefits [15]. Barley is usually found in mixture with bread wheat and sometimes with coarse-grained wheat in excavations at Hasanlu site. Secale or black wheat was more likely consumed as provisions for animals. This type of wheat is rarely seen among samples taken from layers in Hasanlu site at Iron Age but the amount of this type shows that it has been assumed as one of major produced crops in Hasanlu. Millet (*Panicum miliaceum*) is the third major variety of grains found in Hasanlu site. Seeds of this tiny plant are not as fertile as seeds of wheat and barley. Millet, which was cultivated originally in eastern Asia, entered into Near East for the first time at third millennium BC. History of that product dated back to 1550 BC. The scorched millet seeds were found in burned buildings III and IV at Hasanlu near to entrance of citadel. Similarly, millet was found synchronously in Karmir Blur, Bastam, Sos Hoyuk, Tille Hoyuk in Adiyaman and Gordion States [16]. Millet is still cultivated around current Van Lake and it is used for making fermented drink of Boza and bread after mixture with milk or yogurt extract. Based on studies conducted in Hasanlu site, grains, cereals, fruits were cultivated and harvested through wide area. Cultivation of grains such as bean, lentil, mung bean, and pea indicates about 15% of agricultural activity. The major part of crops in Hasanlu included cereals at Iron Age. Lentil (*Lensesculenta*), bean (*Cicer arietinum*), and broad bean (*viciafaba*) were probably considered as main products in dietary menu for Hasanlu inhabitants but bitter vetch (*Vicia ervila*) was more likely consumed as forage for animals.

Bitter vetch or ervil is today consumed to provide forage for livestock as a great part of farming crops in developing countries but it is only focused on strategic products in developed countries. For this reason, natural ranches in these countries are threatened by humans and livestock every year. Also types of sedges (*Carex morrowii*) and Poaceae have been also identified in primary tests for immersion samples taken from layers of Iron Age in Hasanlu site. Varieties of reed have been widely found on Hasanlu debris. Some samples of half-scorched reeds, which were found in burned building III, have been probably used as cover for construction floor or sleeping place for domesticated animal. Today, very wide lands covered with these plants are visible around Hasanlu site. These plants are woven together after collection and mat is made of them and they are utilized as lace

windows and/or on roof on buildings. Shell is considered as one of the most durable materials in archeological field. Shell and shelled animals are used in various forms as food, source of drug, personal ornaments, consuming objects and vowed gifts by human. Shells that are also found in very remote points from their natural habitat may represent as commercial and cultural ties. Most of these shells have been found with amount of 97.8% of destructed layer in Hasanlu site IV. The main origin of 150 other pieces is unknown but it seems that they are related to period IV. Among total 7789 identified shells in Hasanlu site, 7698 items (99%) were extracted from Persian Gulf located 825 km distant at the south and only 79 items (1%) are Mediterranean shells that are situated at 925 km distant from this site at west [17]. It is assumed as basis of study on animal remainders in archeology that one can acquire some information about diet, economy, and environment of inhabitants of archeological sites by this study. Bones of several animals that were widely found in Hasanlu IV is one of the other cornerstones which may contribute to reconstruction of geographic environment in the studied region. Ivories and other discovered artifacts from this site stayed as relics for us and they had been entrapped firing in Hasanlu citadel as a result most of ivories were broken but remained. Muscarella has working on all of ivories skillfully. All ivories were found in first, second, third, fourth, and fifth burned buildings. Images of several plants and animals have been represented within framework of embossed molding on wooden pieces and discovered ivory from Rooms VI, VII, and VIII and the adjacent areas. Ox, lion- some have feathers- deer, and birds of prey are some samples in these designs. Rose designs and narrow panel are composed of lily buds and widely found in group of ivories on this site [18]. It can be said these plants and trees existed in surrounding environment of Hasanlu inhabitants and artists in this habitat have borrowed represented shapes on their ivory from the existing environment.

In 1974, Maurizio Tosi has studied plant seeds from third to seventh periods, Pisdihli at eighth period (fourth millennium) and Haji Firuz site (4th to 6th millennium) included data for 5000 years by means of dry and wet screening technique and about 2500 intact seeds were retrieved. Among these findings, bones of fish, mouse, birds, pieces of egg cover and shell were also found [19]. Nine horse skeletons were found among debris of Period IV where their present and breeding were reported among Hasanlu findings. A great number of skulls of red deer with long horns of this animal were discovered on floor of building where they might be installed on the wall and fell down [20]. With piedmonts covered with grasses and plants and watery plains, west of Azerbaijan has always entertained human groups. Growth and development of various animal and plant species has been always influenced by the facilities in environment as sequential rainfalls that have consolidated link of Human- environment- plants and animals. This effect of climatic fertility is even visible in ranches. Ranches and grazing lands were considered as economic sources for some people at Iron Age. The fix- settlement dwellers also spent their life farming and animal husbandry. Relationship with surrounding environment is starting point for framing and animal husbandry-based economy. Rabat is located in Western Azerbaijan Province and at Eastern bank of Little Zab River. The bricks that have been found in this hill in different sizes include various images of human, animal, and plant where the surrounding environment can be reconstructed only by these objects [21]. Overall, ancient Rabat site and intact nature of this region have prepared suitable conditions for living of various tribes and people (Figure 11).



Figure 11: Tree of Life on Rabat bricks.

Bastam is another one of sites in Western Azerbaijan at Iron Age that is located in Chaypareh Plain in 45 Km from North of Khoy city and 85 Km distant from South Maku. Fortunately, there are suitable remainders to recognize site surrounding environment. Likewise, zoological and botanical studies have provided this opportunity for us to find biological variation at this region in Azerbaijan.

Domestic animals in Bastam comprise of ox, sheep, pig, horse, Canidae, feline, camel, Asian Buffalo, chicken, and white goose. Similarly, wild animals were living in this site such as cow, sheep, deer, pig, wolf, fox, badger, otter, weasel, cat, panther, hedgehog, rabbit, beaver, squirrel, rodents (great mouse), and rat. Some birds are seen among findings in Chaypareh plain including cormorant, ostrich, mallard, Egyptian vulture, crane, bustard, ringtail possum, gannet and also aquatic creatures such as toad and turtle.

The existing trees in this site include grape, almond, apricot, pine, willow, deciduous trees and poplar as well [22]. The barley, wheat, bean, and lentil are considered as plant crops at Iron Age in this region [23]. It can be probably said that this settlement is one of the unique sites at Northwest of Azerbaijan in which archeological discoveries have been scientifically done and their scientific studies have been published. A row of birds with long neck and black color is seen in porcelain piece at Bronze Age when suitable climate has given potential to them for living.

Rhyton with form of head of ibex was found in lower castle along with some seals on which design of various animals and plants has been drawn with lion head and pottery piece on which design of goat and bird was drawn included other artifacts made by inhabitants of Bastam [24]. Wheat and barley have been also reported in two and six rows and bread wheat, lentil, cotton, and broom corn on Ismail Agha Site at west Urmia region [25].

Goy Tepe region is situated at 9 km distant from south of Urmia city. This hill is 24 m high with area extent (600 × 455 m) that has been explored by Berton Brown for six weeks. Seven settlement stories had started from third century BC in this site and they terminated with stories A and B belonged to Iron Age 1 and 2. During settlement period in this site, designs of goat, gazelle, lion, bird, deer (Figure 12) and bones of sheep, cow, pig, equine, and figurines of ox and bread wheat, reed as mat, and tree root were found. The turned rocks are visible with design of ibex and panther that has been attributed to the end of second millennium and early first millennium.

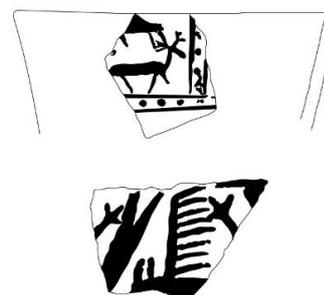


Figure 12: Deer motif in Göy Tepe.

Khorram Abad cemetery that is located in Meshgin Shahr (Khiyav) belongs to Iron Age with respect to the extracted artifacts. Meshgin Shahr is situated at East Azerbaijan including steppe flora and verdant ranches in Ardebil province. The water supplies in this city comprise of Qarasu, Khiyav chaye, and Unar chae Rivers. Sabalan and adjacent heights are rich sources of plants and animals with hot spas. Varieties of plants have been estimated more than 3000 species at Sabalan piedmont. Various types of tame and wild animals are found in this region. Several types of partridge, quill, hoopoe, pelican, crane, pheasant, eagle, and vulture etc. and other animals are visible e.g. wolf, pig, bear, fox, rabbit, hedgehog, and ibex and reptile such as snake and lizards etc. skeleton of dog, sheep remained bones and cow and horse skeletons (34 cases) were found in Grave No 20 (Figure 13). Some of horse lariat and harness is also extracted in this region. The bone residues from cow, horse, and birds along with horse show and timber have been acquired in Grave No 22. In addition, this grave timber in eastern-western direction can be studied by botanical archeology [26].



Figure 13: Skeletons of various animals, especially horses in the Khorram Abad cemetery in Meshgin Shahr.

Application of huge rocks in structures of grave is another case of use of nature for local inhabitants at Northwest of Iran where this type of graves were also utilized in Anatolia and Azerbaijan Republic, and also Armenia at Bronze and Iron Ages. ShaharYeri site is also located in Meshgin Shahr. Rather than artifacts in other periods, major part of discovered artifacts in this site belong to Iron Age.

The graves which have been excavated in this site also comprise of animal residues as animal bone and some sheep knuckle bones of sheep and cow were extracted from Grave S15. Pomegranate- shape

pendant and golden piece with lion head form are considered as other archeological artifacts in this site [27] (Table 2).

Site	Plant data	Animal data	Designs on potteries	Other data
Haftavan Tepe		Sheep and goat	Images of horse, birds, and plants	
Kordlar Tepe		Sheep, cow, goat, dog, mule, horse, and pig		
Bayazid Cemetery (Naghadeh)	Charred grain seeds	Tiny and ground bones (?)		Seal with designs of deer and moving animal, pottery rhyton made in ibex form
Tepe Qalaichi		Herbivorous domesticate animals from Bovidae family including cow, sheep, and goat		Paintings with subjects of plants, geometric designs, and animal
Aqrab Tepe	Remainders of half-burned grains and samples of handle of iron axe with hole are seen in wooden artifacts	Animal bones artifacts (?)		Goat design on pottery with bronze handle in which both side ended to snake's head
Jeiran Tepe	Wooden object	Bones of animals		
Hasanlu*				
Rabat				Bricks with different images of human, animals, and plants
Bastam	Grape, almond, apricot, pine, willow, deciduous trees and maple	Ox, sheep, pig, horse, Canidae, feline, camel, Asian Buffalo, chicken, and white goose and also feral animals such as cow, sheep, deer, pig, wolf, fox, badger, otter, weasel, cat, panther, hedgehog, rabbit, beaver, squirrel, and rodents (great mouse), and rat; and birds such as cormorant, ostrich, mallard, Egyptian vulture, crane, bustard, ringtail possum (calidrid), gannet, and also aquatic creatures e.g. toad and turtle		Rhyton in form of ibex head and seals on which images of different animals and plants are visible
Ismail Agha	Wheat and barley in two and six rows, bread wheat, lentil, cotton, and broom corn			
Göy Tepe	Bread wheat, reed as mat, tree root	Bones of sheep, cow, pig, and equine		Designs of goat, gazelle, lion, bird, deer, ox figurine
Khorram Abad Cemetery	Timber residues	Skeleton of dog, bone remainders of sheep, cow, and horse skeletons		
Shahar Yeri		Animal bone and knuckle bones of sheep and cow in Grave S15		Pomegranate-form pendent object, golden piece with lion head design
Environmental characteristic about Tpe Hasanlu is drawn in separate table.				

**Table 2:** General view of studied sites.

Likewise, during interview with Siyavash Abdollahi deputy of excavation in Ahmad Beyglu site headed by Rezaloo, he has confirmed finding of bones of buffalo, sheep, and dog. Overall, Kheyav or Meshgin Shahr possesses favorable climate with water-abundant rivers. Qarasu River has provided unique climatic situation at this part of Azerbaijan region along with this site and Sabalan peak at south. We can witness presentation of unique achievements in architectural, artistic, and technical products on platform of such climatic and

cultural utilities of people at Iron Age. Simultaneously with Iron Age in Azerbaijan in other regions, Baba Jan Tepe site the artifacts found there are noticeable. Image of various plants and animals have been drawn on potteries at this site. Also animal figurines are some of other subjects [28]. A horse burial was found at layer 2 at Iron Age II that introduces this animal in a part of transport system within wide geographic range [29].

## Conclusion

What it mentioned here was about analysis on plant and animal data, pottery designs, and animal objects and figurines so that with respect to these findings, one can relatively estimate geographic and biologic climate in Azerbaijan. Whereas trees, fruits, and plants Azerbaijan inhabitants used at first millennium BC were totally of varieties which needed to ample water and suitable climate for growth thus it can be concluded that the given region possessed temperate climate at first millennium BC and they were benefitted from adequate water for different purposes. It can be even said that given quantity and variation of farming and plant crops in Azerbaijan at the aforesaid age, this region lacked drought and some trees grew in this region such as box tree and various types of fruits e.g. fig, walnut, peach, and almond etc. that needed to temperate and mountainous climate and fertile lands and a lot of water supplies. On the other hand, finding of remainders of crops such as fig represented rainfall (86-122 mm) at this region. Presence of animals e.g. deer, horse, sheep, goat, mouse, fish, and types of birds suggests suitable environment and platform for growth and development of the latter samples. Moreover, nature and animals in adjacent environment may influence in hand-made artifacts of people in Azerbaijan to the extent that designs of animals and plants are visible in samples of ivory, seals, and figurines as designs of goat, cow, snake, and deer.

The other point which required to be mentioned is current disordered environment that has reflected its side effect as droughts and ecologic changes so that this approach has been converted into foremost concerns for world community over one century of efforts made by supporters of environment. Today modern communities explore environment based on power with human-centered outlooks. Inversely, ecologic approaches will be focused on center of nature and as a result environment will not be destroyed. If perceiving world environmental problems are led to elimination of a concept that Anthony Giddens called 'ontological security' then doubt and hesitation will be increased about position of science and the related institutions and people will look for this sense of security in another place. Geography and climatic position is one of the main cornerstones of reconstruction of background that has led to influence in method of management, land exploitation, and survival and growth separately with respect to any condition.

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