Journal of History Culture and Art Research (ISSN: 2147-0626)

Tarih Kültür ve Sanat Araştırmaları Dergisi
Revue des Recherches en Histoire Culture et Art
مجلة البحوث التاريخية والثقافية والفنية

Vol. 6, No. 3, June 2017

http://kutaksam.karabuk.edu.tr

DOI: 10.7596/taksad.v6i3.971

Citation: Ziaee, M., Nadalian, A., & Marasy, M. (2017). The Ecological Aspects of Local Pottery in Guilan, Iran. Journal of History Culture and Art Research, 6(3), 297-317. doi:http://dx.doi.org/10.7596/taksad.v6i3.971

The Ecological Aspects of Local Pottery in Guilan, Iran

Majid Ziaee[1], Ahmad Nadalian*[2], Mohsen Marasy[3]

Abstract

The modern world is facing pervasive environmental problems and pollution crisis, while in the previous eras, meeting one's need through environment would inflict less harm on one's surroundings. In traditional artifacts, compatibility with the natural environment does exist and in many aspects has been suited with the climate and environmental features of every locality. The main purpose of the study is to identify and introduce the environmental features of pottery of Guilan, Iran. This is achieved by investigating the interaction between the local potters and their environment. The primary data are collected through library resources, field observation and visiting active potteries in Guilan. In this regard, the main research questions of the present study are as follows: What are the features of Guilan local pottery? What features are compatible with environmental standards? To conduct the study, a descriptive-analytical method is employed. The findings show that pottery in Guilan is not a threat to the environment in terms of local knowledge in using raw material, finding resources of renewable energy, community-based manpower, optimum exploitation of time and energy, potteryware designing with various functions, and re-using a product for further purposes. Nonetheless, there exist some issues which are not environmentally friendly like failure to modernize the potteryware to be of use for current needs, high rate of waste over the production process, and using toxic materials in glazing. Therefore, raising environmental awareness of locals, cultural diffusion, informing the users of the benefits of using pottery, and making improvements to the cycle of design, producing, and marketing all play substantial role in preserving local pottery.

Keywords: Iranian local pottery, Handicrafts, Sustainable development, Traditional ecological knowledge, Ceramic ecology, Environmental art.

[1] Ph.D. of Art and Research student, Faculty of Art, Shahed University, Tehran, Iran. E-mail: majidziaee@yahoo.com
[2] Corresponding author, Assistant Professor, Faculty of Art, Shahed University, Tehran, Iran. E-mail: nadalian@yahoo.com
[3] Assistant Professor, Faculty of Art, Shahed University, Tehran, Iran. E-mail: marasy@shahed.ac.ir

Introduction

From a historical perspective, the process of making handicrafts can be seen as having well-thought-out logic and structure behind. The quality, originality, and distinctiveness would feature a handicraft a museum piece and create the sense of its belonging to our own cultural heritage. However, today such products are of low quality, have not kept pace with the present world developments, and are being gradually replaced with industrial products. In societies that are in a period of progressing from a traditional society to a modern one as in Iran, handicraft products are essentially much different from what was produced in the past. The products are not categorized as necessities and the ornamental and symbolic aspects have outweighed the active role they used to have in people's lives.

Replacing industrial products with native handicrafts might lead to destruction of creating and using handicrafts and also threatening human lives and their natural surroundings. While for example cooking utensils made out of clay would fit well with the human life style and the environment, nowadays plastic pollution is a basic problem that developing countries have to deal with.

As the advantages of handicrafts and organic products over technological ones using industrial products have dawned to all, the use of such products in everyday lives has not diminished in some developed countries. This study introduces the environmental features of pottery in Guilan, and carries out a case study on that, as the research is an attempt to preserve the natural environment and improve the manner of consumption. In this article, after a definition of environmental art, standards and criteria of pottery making concerning the environment will be introduced. Then the process of pottery making in Guilan in terms of ecology will be described and finally, environmental features of Guilan pottery will be explained by analyzing the three factors of the production process, product use and recycling.

Methodology

In order to understand the ecological features of pottery in Guilan, descriptive-analytic method was used. Data were collected through visits to potteries, observation and interview with workshop owners and workers, handicraft sellers in the area, and officers at Cultural Heritage, Handicrafts and Tourism Organization of Rasht. The scope of the study is potteries specialized in production of native potteryware of Guilan including 17 village workshops in Sakineh Abad [sakine ɑbɑd], Asalem; Larsar [lɑɹsaɹ], Sowme'eh Sara; Jirdeh [dʒiɹdeh], Guildeh [gildeh] and Khortoom [χoɹtum], Shaft; Mehrbon [mehɹebon] , Siahkal; Layalestan [lajɑlestɑn], Lahijan; Khomeir Mahale [χumeiɹ mahale], Rudsar; and Khomeir Mahale

[χumeiɹ mahale], Amlash. Qualitative analysis was used to analyze the data, and International Phonetic Alphabet (IPA) was employed to show the exact pronunciation of local words.

Background

A substantial number of theses and dissertations have been written on Guilan local pottery, one of which is in research department of Guilan studies at the University of Guilan. The research, which has been expanded into a book, studies the production and process of pottery making in Guilan. The book (Rafie & Rahmati, 2014), is an asset for the present study as it introduces the villages and workshops of pottery making in Guilan, as well as a typology of various products along with some documentaries about the process of conducting such research. In this book, researchers have mentioned cultural, economical, agricultural, and literature related factors as effective on local pottery making, and have addressed the related problems.

In the present study, environmental standards of pottery are of paramount importance. To determine such standards, some researches, conducted on practical strategies for artists and workshop owners have been used (Harrison, 2013). In addition, the findings of a Japanese company (Yamashita, 2003; Miyachi & Hasegawa, 2009; Hasegawa, 2011) on production and use of ceramic tablewares have been exploited.

One of the most important studies closely related to the present study is "*Ecology and ceramic production in an Andean Community*" (Arnold, 1993), a book studying and analyzing the local pottery of Andean (of the Andes) communities[i] in terms of cultural ecology. Here the writer has focused on the relationship of the process of traditional way of pottery making and the surrounding environment. From a theoretical perspective and the topics, the study is particularly similar to the present study; however, here the aim is to find environmental aspects of local pottery rather than anthropological features.

Ecological Art (Theoretical Foundations)

After the industrial revolution and overuse of resources, mass factory production and subsequent pollution caused ecological crisis. Solving such problems is one of the most widely discussed issues of the current century and it has found its way in the world of art. As an example, environmental art movement particularly its main branch "eco-art" is following this trend. As a contemporary art movement, eco-art deals with environmental issues and mostly puts forward collaboration and restoration. Here function is at the priority and the form

of eco-art usually emerges from the function (Bower, 2016). In other words, the function makes using a special from inevitable.

Various attitudes proposed in eco-art are presented in Table 1. Some of the trends mentioned are in line with the aims of the present study. For instance, ongoing issues in eco-art like remediation projects, activist projects, current culture preservation attempts, pedagogical works, and sustainable development are parallel with the investigative approach of the present study.

Table 1. Approaches to Eco-Art (Ecological Art, 2017)

Type of approach	Aims and features
Representational Artwork (formal)	Conveying the message of an artwork through image-making or object-making
Remediation projects	Restoring and remediation of disrupted environment and polluted ecosystem
Activist Projects	Informing, energizing and making major changes in behaviors and public policy
Social sculptures (social mechanisms)	Artworks based on social cooperation, sustainable practices and effects on lifestyles
EcoPoetic approaches	sense of co-existence with other species and of obtaining inspiration from natural world
Direct Encounter	Working with natural phenomena such as water, weather, sunlight, plants etc.
Didactic or Pedagogical Works	Sharing information about environmental injustice and ecological problems such as water and soil pollution and health hazards
Lived-and-relational Aesthetics	Emphasizing sustainability and preventing destruction of current cultures

Environmental standards in pottery production

In the present era, a great of research has been done to decrease the environmental damages involved in the production of pottery. Such sources can be used to draw out ecological standards in producing pottery. Such standards have been formed based on current life needs and necessities, and are aimed at using resources sustainably, reducing pollution, raising user satisfaction, and lengthening the durability of a product.

Changing soil to ceramic in firing process is harmful to the natural resources, and nature is not sturdy enough to return to the previous state. Even though the product, namely the ceramic, is not considered a serious damage to the environment, in the long run however, it might be a threat to nature. Extensive research has been carried out in Mino dish production area (in central Japan) all focusing on this matter. Researchers are trying to find a solution to produce a kind of ceramic which needs less energy to produce, distribute, use, collect, destroy and recycle. Their research proves the fact that the required energy to recycle ceramic products is equal or less than the amount of energy needed for the usual process of ceramic production (Yamashita, 2003).

This project involved an essential part which was to establish cooperation with customers to return their used products to the producers so that they could use them as raw material. Having reached such cooperation with users in various areas, they created a system of recycling and marketing based on the natural environment. The project has created a multi-purpose system of cooperation among the company representatives, government organizations, and academic researchers. The result is the production of a kind of dish called Re-shokki released to the Japanese market. Fig. 1 shows the process of production and reuse of the dish.

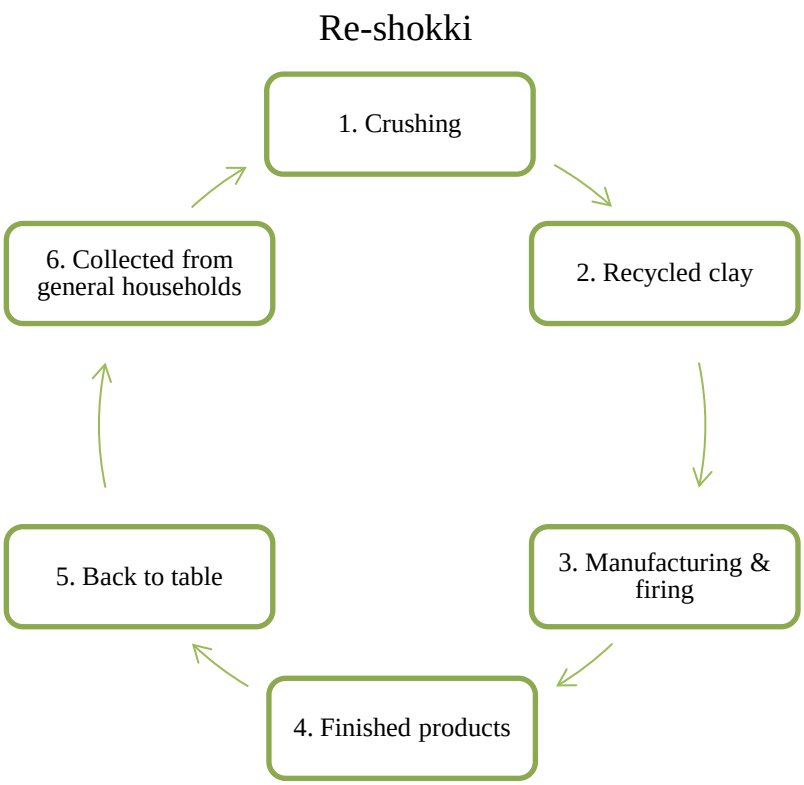

Fig. 1. Life cycle of recycled tableware (Hasegawa, 2011. 77)

In an article titled "Approach to construction of recycling system for porcelain" (Miyachi, & Hasegawa, 2009), academicians believe two issues should be addressed. The first one is reducing the amount of energy used, as well as carbon dioxide produced while firing and manufacturing ceramic, and the second issue is sustainable use of non-renewable resources such as clay, silica stones, and feldspar. Mine closures and the exhaustion of quality materials have raised concerns over shortages in raw materials. Therefore, reusing a product is a countermeasure and leads to further development. Considering these studies, some environmental standards about pottery making are introduced in Table 2.

Today one of the main environmental concerns is reducing usage and boosting the quality of products. As such, some of the standards introduced in Table 2 emphasize the matter of raising user satisfaction. This is because of the fact that raw materials and consumed energy would be used to produce quality material with longer durability.

Contemporary designers and artists have made significant work on special capabilities of ceramic in terms of designing and architecture. Some of the environmental ideas for pottery making are also derived from these capabilities. For instance, Siesta is a product to keep water that has been designed based on traditional function of local Spanish water carrier called botijo, and has striking resemblance to the present day plastic bottles. The designer, Hector Serrano says: "We used white terracotta, this material has no added coloring or glaze, just a small portion of salt, which helps keep the water cool, even when the sun is hot" (Lefteri, 2006). Serrano's design for this utensil is considered user-friendly. Using the cooling ability of pottery instead of consuming energy with cooling machines is so environmentally beneficial. On the other hand, it can be replaced with disposable plastic utensils which have caused many environmental concerns around the world.

Table 2. Environment Oriented Standards and Actions in Pottery Making (Researchers)

Production	**Raw material**	Using local raw materials without their movement / optimal use of raw materials and saving resources (using the least materials, avoiding overusing resources) / using recycled raw materials = reducing waste = sustainable use of natural resources.
	Energy resources	Using renewable resources / reducing energy use to reduce greenhouse gases and prevent global warming / reducing energy waste (optimizing kiln productivity) / controlling toxic gases for health, safety and environment / preventing water pollution

	Production process	Using updated technology = improving human productivity = economic growth and more added value / creative exploitation of facilities, production capabilities and methods (using multiplication and reproduction) / ease of production process (removing extra steps like decoration) / improving quality product, manufacturing a quality product with high running costs rather than high-priced raw material / attempts to reduce waste and improve the clay and firing process
Use	**Application**	Making efforts to produce durable and strong products (from designing and technical views) / paying attention to the importance of usage = reducing useless or rarely used objects / raising user satisfaction (paying attention to safety and comfort of the user) / compatibility with today lives (reducing the space on kitchen shelves or dishwasher), making easy to use (not hefty and easy to hold in hand, easily fitting on shelf, not breaking when moving) / washability (not sticking detergents on it, ease of use when washed in the dishwasher) / designing for multinational dishes and usage rather than for merely a few special dishes thus limitation of use
	Health	Removing or controlling toxicity of heavy metals like lead, using various earth color instead of toxic colors (natural body color) / resistance against cracks and sudden moves and reducing water absorption for sanitary matters / easy washability and cleansing because of glazed surface
Reuse	**Recycling**	Recycling the waste in production phase / collecting the waste to achieve two purposes: sustainable use of resources and reducing the waste/planning for easier recycling (easier breakability, not joining with other materials like wood or metal)
	Designing system	Running production cycle, usage and reuse by asking for cooperation of customers and salespeople (creating various strategies to take cooperation of the society in the plan) / informing users (creating a new network in order to share information, culture diffusion, and informing the public of environment, making changes in lifestyles) / creating job opportunities (setting up stalls for collecting tableware from shops, or shopping centers working under the system) / making

		efforts to convince the government to purchase the green products at an inexpensive price / selling the recycled clay to educational centers for creating the appropriate culture

Guilan Local Pottery

In this article, the name local pottery is attributed to those traditional and cultural products of potteries in different parts of Guilan province which has survived in the contemporary period and has preserved its cultural richness. This profession like basket weaving and cooking bread is an integral part of natives' lives. Preparing raw materials and working process have been ingrained in their lives, and the necessities such as roof pottery, kitchen utensils and cookware have been taken care of through such profession.

The soil for major potteries of Guilan is supplied from the surrounding farming fields. Due to the high rate of iron in the soil covering this province, the color of pottery after firing is visually eye-catching, therefore most products are sent to the market with no glaze. Another feature of the soil is its resistant to thermal shock that has led to the production of various types of dishes and object by being exposed directly to the fire. This feature has turned Guilan into a strategic area in production of some cookware like a special kind of firing pot called Gamaj [gamadʒ]. Table 3 shows that the majority portion of raw materials for pottery are supplied from local sources.

Table 3: Local and non-local raw materials

used in current potteries in guilan (researchers)

Body	Local clay of the area	Extracting from farming fields	**Local raw materials**
	Gravel to be used for the bottom part of some of the tableware	Providing from river bed	
	Sand to be used to separate the pieces from the plate of the wheel and also to mixing with clay	Extracted from the beaches	
	Ash to be added to the soil in some areas	Extracting from	

		the kiln	
	Engobe	From the body clay (compound of purified local clay and water)	**Non-local raw materials**
Surfaces covering	Tin-lead glazed (traditional glaze)	Automotive battery (lead), tin, TV screen glass, Toufal Mes [tufɑl-e mes] (copper oxide). Except tin, the other materials are recycled from waste materials.	
	pre-prepared glaze	Industrial transparent glaze and copper oxide (common in workshops with high production rate)	
	Industrial colors	Non-fired colors (a serious falsification, in workshops that cannot use glaze)	

Varying based on the type and the area of the product, forming method of Guilan local pottery is done through five different methods:

1. Coiling method for bulky objects: The method is common in tandoor (traditional oven) workshops in the western part of Guilan.
2. Electric and treadle wheels: The electric type is mostly observed in new workshops with a high rate of production.
3. Simultaneous methods of wheel and coiling: Wheel refers to the currently used banding wheels and mostly used in Jirdeh village.
4. Slab building for making roof tiles: Wheel was also used to be used to make such pieces but now this method has been abolished.
5. Hand building techniques: This method is used to make small sculptures.

Decoration includes lines curved around a dish. In some cases, rope shaped or grid lined decorations are applied on the lips or outer surface of a dish. In general, decoration of such products is less embellishing than those in other parts of Iran, instead, their practical benefits

play an obvious part in lives of people. Fig. 2 shows workshop environment and tools of forming and decoration used by potters.

The variety of tools and equipment used in workshops is determined according to the type of work being done. In most of local potteries, such equipment is provided by potters themselves. The important point here is the wood-fired kilns and the knowledge of locals in using them which are less frequently seen in any other region of the country. That can probably be attributed to the abundance of kiln fuel in the region because of the large forest areas. In other pottery centers around Iran, turning to oil or gas instead of wood as fuel has led to changes in form of kilns and also less variety in their structure. However, field studies show that the variety in the region is in the danger of extinction as the newly built workshops are not using wood-fired kilns.

Garkeh [gaɹkeh] (carving and modeling tool), Atie Roshanfekr, Jirdeh

Laleh [laleh] and Haker [haker] (carving and modeling tool), Mahmoud Shokri Workshop, Mehrbon

Electric wheel, Mohebbi Workshop, Khomeir Mahale, Rudsar

Banding wheel, carving by Garkeh the surface of Gamaj, Atie Roshanfekr, Jirdeh

Treadle wheel, RajabAli Esmaeelzadeh, Khortoom

Treadle wheel, Banoo workshop, Khomeir Mahale, Rudsar

Fig. 2. Forming and finishing tools in various workshops (Ziaee, 2016)

Workshops that manufacture more products usually prefer gas-fired kiln. Most of the gas kilns of this region are made similar to Hamadan traditional kilns and with the advice of Lalejin[ii] potters. In order to save energy, during firing gazed objects are set on other pieces, so closer to the ceiling where it is reached maximum temperature (Shokri, 2016). The structure of wood-fired kilns of Guilan is divided into three types:

1. Bonfire kiln protected with a small wall: As one of the most primitive ceramic firing kilns in the world, this one is used to make huge pots like tandoor in Sakineh Abad, Asalem, and Larsar, west Guilan. As shown in Fig. 3, the protected wall of kiln is made up of simple brick and grass & mud with a few ventilation channels. Metal sheets or broken pottery are used to cover the roof during firing that of course do not act as perfect insulators and cause waste of energy. Waste products of lumber yards are used as fuels for such kilns in Sakineh Abad, Asalem.
2. Updraft kiln: It is a developed form of previous kilns. Some modifications like stretching up the walls and installing a separate chamber as fire box under the kiln have been applied to make more use of heat and to prevent heat loss. Upon further developmental steps, a mud dome is covered up and suction happens from the top and through some holes on the roof, Fig. 4.
3. Climbing kiln: It is mostly found in Amlash and Rahim Abad, east Guilan. These kind of kilns are usually built on side natural slope that leading to the river.

The noticeable point about such kilns is their mud and sand structure. The walls are made up of a mortar of clay and sand with some thin pieces of wood as rebar in the middle of the wall. It is only in this type of kiln where pottery pipes, made by the potter, are used as the covering of the roof to both prevent demolish and to make the roof lighter. In a kiln built by Ali Ashraf Babaie in Khomeir Mahale village, cracked jars (waste) were used instead of special pipes to cover the roof which can be a kind of recycling, Fig. 5.

Fig. 3. Bonfire kiln protected with small wall, Sakineh Abad, Workshop of Mr. Salehi (Ziaee, 2016)

Fig. 4. updraft kiln, Guildeh, Shaft, workshop of Mr. RajabAli Esmaeelzadeh (Ziaee, 2016)

Fig. 5. Reusing waste jars in building the roof of the kiln, yoghurt jars sticking out the ceiling are recycled ones and an environmental aspect, Climbing kiln, Khomeir Mahale, Amlash, Ali Ashraf Babaie (Ziaee, 2016)

Guilan pottery includes various types of practical and non-practical dishes and objects, and the practical part is the major one including dishes which are still used in everyday lives of the people (Gluck, 1977). Beside this categorization, there can be other criteria to consider to categorize as well like techniques and methods of manufacturing, firing, glazing, dimensions, form etc. Fig. 5, shows various containers, objects, and sculptures of different parts of Guilan.

One important feature of the Guilan local soil is its resistance against heat which is unique across the country. This is a major reason for the creation of such array of practical containers in this province, that are all used for cooking where there is the possibility of direct contact with the heat. Gamaj [gamadʒ] (cooking pot) is one of the most famous ones used for cooking different types of stew and local dishes of Guilan. In spite of the availability of all modern dishes, this traditional pottery pot is still favorable among the locals.

Kalbij [kalebidʒ] is a dish with no glaze and specific for frying anchovy fish. The back side of the dish is also used to bake a type of bread called Kalbij bread, and this is the interesting point about this dish which is dual-purposed-both inside and backside are useful. Kalbij is not the only dual-purposed dish, Gamaj is both used as the normal pot, and for baking bread, and sometimes to protect against rain on the roof of the rice storeroom. As Rafie and Rahmati (2014) put it, Dushan [duʃʌn] (big butter churner) is reused as grain container when the yoghurt breakers inside worn out. Table 3 shows pottery products of the region, and the data have been collected through field studies and library sources (Sadeghi, 2014; Rafie & Rahmati, 2014; Marashi, 1984).

Table 3. Application of Pottery Products (Researchers)

Dishes	**To keep or prepare food**	Dushan Nerkhe/ Nireh [duʃʌn neɹχe/ nejɹe]	A jar for processing dairy products, getting butter from yoghurt/ keeping beans
		Kale [kale]	A big jar for making and storing yoghurt
		Mast Taar [mas(t) taɑɹ]	A big yoghurt bowl
		Maste Goole [mas(t) gule]	Yoghurt Jar
		Shirfoukouz [ʃɪɹfukuz]	Milk measure-up jar used by farmers
		Galeshi Kozeh [galeʃi kuzeh]	Big milk jar with different capacities
		Kazej/ Kadej [kazedʒ]/ [kadedʒ]	A dish used to rub Kashk (drained yoghurt)
		Namakyar/ Namkar [namakjɑɹ]/ [namkɑɹ]	A special tray used to rub and mix leaf vegetables, walnuts, salt, etc.
		Ab Taar [ɑb taɑɹ]	A special jar used for carrying water from the springs
		Namake Goole [namak-e gule]	Netted jar to sprinkle salt water on rice

		Khoum [χum]	Large pot for vinegar or salted fish
		Chal Goole [ʧal gule]	Special jar for keeping dry-fried meat
	To prepare or cook food	Gamaj & Nokhon [gamadʒ & noχun]	Glazed pot with a lid for cooking stew
		Kalbij [kalebidʒ]/ Koli Kalbij [kuli bidʒ]	A dish used to fry anchovy, and bake bread
		Nan Bij Tave [nɑn bidʒ tɑve]	A convex pan for baking local bread
		Lakoo Bije [lɑku bidʒ]	A dish with a deep convex for making rice bread
		Dizeh [deze]	A deep pot with two handles or Abgoosht (Iranian traditional food) pot
		Gilaki Tave [gilaki tave]	A pan for roasting seeds and frying
	Use in local medicine	Poshtan Goole [poʃtan gule]	Also called "waist jar" and is used in hijama (wet cupping)
Objects	**For cooking**	Foko [foko]	A tool for flattening bread dough
		Cheragh Koori [ʧarɑg kuɹi] or Kale [kale]	Traditional cookery stove
		Mnghal [manɢal]	Barbeque for kebab
		Tonoor [tonur]	Tandoor
		Lakopiji Tonoor [laku-padʒi tonur]	Tandoor for rice bread
	Related to architect	Tanbooshe [tanbuʃe]	Pottery drain-pipe
		Tefal/ Sofal [tefɑl]/ [sufɑl]	Clay roof tile (made by pottery wheel)

	ure	Plate tile of roof	Clay roof tile (formed in mold)
		Gamaj [gamadʒ] or a particular piece for top of roof	To protect against rain on the roof of Kandoj [kandudʒ] (rice storeroom)
		Chata [ʧɑtɑ]	Cylindrical pipes on the top of a water well
	For poultry farming	Abdan [ɑb-dɑn]	Chicken waterer
		Kish-ken [kiʃ-kən]	Chicken cage
	Other objects	Kecha Dechin [kaʧe daʧin]	A container for keeping wooden spoons
		Hovoo [hovo]	Chamber of smoking pipe
		Pool Dakhl [pul-daχl]	To collect money in a shop
		Gele Shibzane [gale ʃibzane]	Various animal shaped small whistles
		Fishing weights	Used in fishing nets
		Ab Khane [ɑb-χɑne]	Cylindrical container as patty baby-toilet
		Ghoki [guki]	Netted dish for creating smoke around bee hive when collecting honey
Sculptures		Various animals like cow, goat, deer, birds, and fish	

Nakmar, Mahmood Shokri workshop, Mehraban

Dushan, Mahmood Shokri workshop, Mehraban

Maste Goole, Babaie workshop,
Khomeir Mahale, Amlash

Kish-ken, Molouk Sadeghi workshop, Jirdeh

Namake Goole, Babaie workshop, Khomeir Mahale, Amlash

Gamaj & Nokhon, aged 50 years, Deylaman

Kalbij, Maste Goole, Nireh, Babaie workshop, Khomeir Mahale, Amlash

Maste Goole, Mohebbi workshop,

Khomeir Mahale, Rudsar

Whistle, Fazelifar shop, Layalestan

Tandoor, Mokhtar Bitama'e workshop, Larsar

Sculpture of a deer, Fazelifar shop, Layalestan

Roof tile, Mohebbi workshop, Khomeir Mahale, Rudsar

Fig. 5. Various dishes, objects and sculptures of potteries and handicraft shops of Guilan, (Ziaee, 2016)

Ecological aspects of local pottery in Guilan

In Guilan, due to the high amount of iron, frequent and high humidity, clay is of high standard in terms of color and quality. Local knowledge of residents helps them extract their

required sources from different areas in the ecosystem. Looking at Guilan potteries, it will be clear that making use of a local pattern to supply fuel sources is a common trend. The energy source of pottery kilns is mostly fueled through wood and recently through fossil fuels (like gas). Most potters who own wood-fired kilns find their fuel sources from demolished buildings and branches and trunks of trees (Mohammadi, 2016). This shows the special attention of potters to the dissipating sources of energy.

However, as some potters mention, Natural Resources Organization has imposed some limitations over the exploitation of soil and jungles (Bitama'e, 2016). Although field studies show dissatisfaction of locals by this, it shows that overuse of natural resources is now a threatening issue.

In potteries of Guilan, women usually take the main responsibility of making the objects and men carry out the more difficult work like transporting clay from the fields to the workshop or taking the objects to the kiln or the market. Such activities until manufacturing and drying are limited to the boundaries of a house, but then for firing and marketing, human relationship spread to the village or even nearby villages. Sharing a kiln is customary in some villages like Jirdeh and Khortoom. Potters usually sell their products to another workshop where firing facilities exist. In spite of saving energy advantage of this method, some potters have built their own kiln in their workshops.

Pottery making is a seasonal job in Guilan, and villagers usually take on this job as a second source of income besides farming. Therefore, extra time and energy are used for pottery making. In the past pottery making was done completely away from technological advancements, but little by little some machines and tools like electric wheel, Jar rolling mill for grinding, and gas kiln spread out.

Contrary to the most of the local pottery making centers in Iran where pottery products are manufactured for decorative and symbolic purposes, pottery in Guilan plays an important role in lives of locals. It is an inseparable element of cooking in the region. Designing and use of dual-purposed dishes like pans and pots are substantially significant in terms of environmental features and are similar the attempts of designers in Green Design or eco-design field.

The target market for these products is often local communities that are familiar with how to use them. After modernization and increase in population was expected to make the handicrafts grow and adapt themselves to the present time situation, however, designing problems and failure in meeting user's expectations have prevented pottery products in finding their way among people of the modern world. Matters like too thick body, fragility, lead-glaze

and disregard of current needs (like using by dishwasher) have made them have a limited use in local life, whereas the region is rich enough to produce pottery need of modern life.

Ceramic, for being healthy is vastly popular over the world. On the contrary, new kitchen utensils made of plastic, melamine, PTFE (Teflon), and aluminum may seriously harm our health and cause deadly diseases like cancer (Rafie & Rahmati, 2014). Raising awareness of the society of such dangers, and improving the design of the dishes by local potters can boost the position of such dishes among people. It should be pointed out that using lead glazing which has been common in Guilan since days of yore might be harmful to the health. Such kind of glaze should have a high chemical resistance; otherwise, it would be a threat to all users (Rahimi & Matin, 2008. 485). In addition, toxic vapors produced during making and firing process are a deadly threat for the potter and also for the user in case they remain on the surface of the final product.

In recent years, there has not been much attempt in reusing workshop waste or discarded pottery dishes in Guilan. Grinding and reusing the waste can improve the shock resistance of the body as well as providing the benefit of recycling. As was mentioned before, the basic principle of making cooking-ware in Guilan is thermal shock resistance, and producing recycled clay helps improve it.

Dushan and Maste Goole were mentioned in previous part as examples of discarded dishes which are reused. This shows the right culture of use in traditional societies, something which is lacking in the current life styles. Another related example is observed during Chaharshanbe Suri (Iranian festival of fire). In Guilan, people believe that keeping old things at home will bring about curse and evil, and breaking old dirty pottery dishes keeps all the sorrows and bad luck away (Boshra & Taheri, 2006. 72). In an interview with HoseinAli Loghmani (2016) in Khortoom village, the performance of such breaking festival in the market on the last Wednesday of each year was attested. People believe that on such a day, they should break a Gamaj. So, Potters sell them damaged pots at a lower price. Therefore, damaged dishes would be of use and enter to market for the sake of rituals and traditions of the locals.

Conclusion

In recent years, environmental issues have gained prominent importance, so a great deal of practical studies has been conducted to lower the environmental damages of production and use of pottery. Referring to such discussions, the present study tried to categorize standards and actions in raw materials, sources of energy, manufacturing process, application and health. The studies showed that reusing waste or discarded ceramic products is quite prevalent

in developed countries. Aiming for cultural diffusion and reducing environmental pressures, they have made a type of product that is a valuable example for research and practical actions in this field.

Findings of field studies and documents show that local pottery making in Guilan has relatively dwindled compared to previous years and many workshops have closed down. Studies have demonstrated that traditional pottery making in this region features many local and environmental aspects. Explaining these features can lead to the inception of planning and policy making on the part of government or private institutions to activate the present slump situation. In order to answer the main research question of the study, aspects of Guilan pottery parallel with ecological standards from production to use and recycling are listed here:

1. Supplying raw materials from local sources, thus no need for transport (here the knowledge of locals in using raw materials and extracting them from suitable areas is noteworthy).
2. Using energy derived from recycled materials in wood-fired kilns.
3. Replacing fossil fuels with wood and consequently saving jungles and natural resources
4. One phase firing in most of the dishes (without glaze), thus less use of energy
5. Boosting the productivity of the firing process by setting glazed products on the upper part of the kiln.
6. Saving fuel by sharing a kiln (the method used in Jirdeh and Khortoom villages)
7. Optimal consumption of energy by using the drying room and kiln energy to dry the pieces.
8. Manufacturing some of tools by potters like kiln, the banding wheel, finishing tools etc.
9. Making use of the technology like electric wheel, electric grinding mill to improve the quality and to optimize human productivity.
10. Producing simple products with the least time spent on decoration during manufacturing.
11. Using extra working power to be spent on a seasonal or second job
12. High usability of most products

13. Multi-purposed dishes (the application of Gamaj and Kalbij)
14. Using the colorful feature of the soil itself in most dishes, roof tiles and sculptures rather than toxic covering colors.
15. Making attempts to decrease water absorption by using glaze. This eases washing and makes it more useful when cooking (of course the glaze should be replaced with a non-toxic one).
16. Reusing the worn out and discarded dishes

Studying Guilan pottery and evaluating ecological features, the present study showed that some ecological standards are followed by local potters thanks to their own local knowledge, and at some points however production and use are not eco-friendly. Identifying and introducing local potentials can lead to major steps in improving production process, disseminating culture of using pottery, and sustainable development. A solution to improve the situation of this profession is to set up a support center to carry out research, and provide designing and technical services.

Footnotes

[i] Andean community: including four Latin American countries of Bolivia, Colombia, Ecuador, and Peru.
[ii] Lalejin [lɑledʒin]: A village near Hamadan, Iran that produces the highest number of pottery products in Iran.

References

Arnold, D. E. (1993). *Ecology and ceramic production in an Andean Community.* New York: University of Cambridge.

Babaie, H. (2016, June 18). Giulan Local pottery. (M. Ziaee, Interviewer) Amlash, Guilan, Khomeir Mahale Village, Ali Ashraf Babaie workshop.

Bitama'e, M. (2016, June 24). Giulan Local pottery. (M. Ziaee, Interviewer) Sowme'eh Sara, Guilan, Larsar Village.

Boshra, M. & Taheri, T. (2007). *Festivals and rituals of guilan people (nouroz ceremony).* Rasht: Farhang Iliya.

Bower, S. (2016, March 21). *A Profusion of Terms.* Retrieved from green museum: http://greenmuseum.org/generic_content.php?ct_id=306

Ecological art. (2016, July 17). Retrieved from Wikipedia: www.wikipedia.org/wiki/Ecological_art#cite_note-47

Gluck, J. & Gluck, S. H. (1977). *A Survey of Persian Handicraft: A Pictorial Introduction to the Contemporary Folk Arts and Art Crafts of Modern Iran.* Tehran: The Bank of Melli Iran.

Harrison, R. (2013). *Sustainable Ceramics.* Ohio: the American Ceramic Society.

Hasegawa, Y. (2011). Ceramic Tableware Recycling by Green Life 21 Project; Efforts for sustainable manufacturing in a traditional local production area. *RED Objects; Collaboration in Experimental Design Research* (pp. 73-82). Sydney: School of Design Studies, College of Fine Arts, University of New South Wales.

Lefteri, C. (2006). *Materials for inspirational design.* UK: Rotovision.

Loghmani, H. (2016, June 17). Guilan local pottery. (M. Ziaee, Interviewer) Shaft, Guilan, Khortom Bala Village.

Marashi, A. (1363). *Dictionary of Gilaki language.* Rasht: Ta'ati.

Miyachi, N. & Hasegawa, Y. (2009). Approach to Construction of Recycling System for Porcelain. *CERAMICS JAPAN*, 31-36.

Mohammadi, A. (2016, June 19). Giulan Local pottery. (M. Ziaee, Interviewer) Rudsar, Guilan, Khomeir Mahalleh, Banoo Sharif workshop.

Rafie, A. & Rahmati, A. (2016). *Pottery and cley in Guilan.* Rasht: Guilan University.

Rahimi, A. & Matin, M. (2009). *The technology of whitewares.* Tehran: Sherkat Sahami Enteshar.

Sadeghi, H. (2015). *Design and manufacture of ceramic works according to the results of Anthropology local ceramics Guilan; case study Rahimabad & Amlash region.* Tabriz Islamic Art University, Islamic Arts. Tabriz: non-publish.

Shokri, M. (2016, June 19). Giulan Local pottery. (M. Ziaee, Interviewer) Siahkal, Guilan, Mehrbon Village.

Yamashita, N. H. (2003). Study of Environmentally-friendly Traditional Ceramic Products - MINO “Re-Tableware” and Green Life21 project. *6th Asian Design Conference* (pp. 1-5). Tsukuba: Interaction Design Foundation. Retrieved from http://www.idemployee.id.tue.nl/g.w.m.rauterberg/conferences/cd_donotopen/adc/