

**Main Pathway:** The main pathway in Moorcheh Khort extended from the southwest to the northeast connecting the two main entrances. Side pathways branched out from the main pathway based on the positions of neighboring residential units, their relationships, and possibility of intrusion from other units.

**Covered Passageways:** Covered passageways were considered important in Iranian architecture from ancient times and were arranged in such a way as to provide continuous shade from the sun and heat during summer days. They also helped to provide protection from seasonal winds. Many covered passageways ended at residential units and were helpful in building a sense of solidarity and neighborliness among residents, as well as providing extra security. This type of passageway is referred to as a locked passageway.

Roofs, as well as rooms, were built over these passageways and were formed based on the positions of adjoining units, their relationships, and possibility of intrusion with considerations given to environmental conditions and the effective use of space.

4. CONCLUSION

Based on the first article of the Venice Charter (ICOMOS, 1964), a historical site not only includes single buildings but also urban or rural community complexes that represent a certain civilization, a recognized advancement, or a historical event. Historic classification can include major works of arts, as well as ordinary ones, which have gained cultural significance by passage of time. Rehabilitation works on historical sites create a working relationship between the historical site and workers (Falamaki, 2007a). Rehabilitation works are an undertaking that requires knowledge more than ingenuity; patience more than productivity; conscience more than enthusiasm; and pride more than financial gains.

Research on historical sites requires multidisciplinary studies involving the identification of construction materials and the interrelationship of structures. Protective rehabilitation programs based on guidelines provided by international charters require intra-project decision-making. Project supervisors can obtain funding for rehabilitation projects based on priorities. A detailed program was drawn up outlining the protective needs for Moorcheh Khort historical fortress. Meanwhile, a short

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LOCAL SOCIO-CULTURAL KNOWLEDGE SYSTEMS AND ASSOCIATED INTANGIBLE HERITAGE PREVALENT IN UGANDAN EARTHEN ARCHITECTURE

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Theme 5: Local and Regional Knowledge, Intangible Heritage and Social Impact  
Keywords: Local knowledge, earthen architecture

Abstract

At this time, the subject of local and as well as regional socio-cultural knowledge systems, and associated intangible heritage prevalent in African earthen architecture is seldom regarded as a worthwhile focus to warrant attention of academics, professionals and public-private sector partnerships in Africa. Yet these knowledge systems and attendant intangible heritage proliferated productive impacts towards the sustenance of indigenous education and related social-cultural values, customs and traditions of pre-Colonial African societies. Apparently, African earthen architecture provided the medium for transmission of knowledge systems together with intangible heritage. Their resilience has continued to date but at a much-reduced level of significance. In this connection, African earthen architecture is among the continent's heritage fabric currently undergoing obsolescence and severe decline in enriching new generations with timeless knowledge systems.

In instances of the above-noted obsolescence, the connection between intangible heritage and the African people has likewise diminished and become increasingly confused. Concomitantly, uni-dimensional globalization has taken its toll and the new generations have been left adrift. They are increasingly disconnected, and attempting to understand themselves. Consequently, their cultural landscapes and earthen-built ensembles are also threatened with disintegration.

Hence, this paper highlights the compound threat to local African socio-cultural knowledge systems and associated intangible heritage prevalent in earthen architecture by means of a case study with Ugandan examples. Thereafter, the paper unfolds 'best-practice' pathways for mitigating against the vulnerability of these socio-cultural knowledge systems prevalent in the earthen architecture, so as to ensure their continuity.

1. INTRODUCTION

For background since time immemorial, African socio-cultural and ethnographic knowledge systems in their diverse artisanal, symbolical, mythological, magical, metaphorical, proverbial, and poetical configurations are profusely transmitted through oral and artisan traditions of rock art, textile design, infusion in ceremonial objects, decorative drawings, tattoos, rites, masks, figures, legends, fables, metaphors, proverbs, etc. Since the knowledge systems on their own are, in fact, invisible, African civilizations best converted some of them into tangible form by communicating, expressing, and representing them architectonically. In an investigative context, it is this category that is captured in this paper. In this regard, African earthen architecture, in general, and the Ugandan earthen ensembles, in particular, are customarily imbued with a good amount of these knowledge systems by means of artisanal inclusion in the walls of most traditional human habitations.

Semioticians make their reflections on this occurrence and applaud the artisans for this ethno-instinctive vocation synonymous with a corporate mouthpiece for indigenous knowledge systems and associated intangible cultural heritages (Cobley and Jansz, 2004).

Thus, apart from providing shelter, this merit makes Africa's and, case-specifically, Uganda's indigenous earthen architecture double as a materially energical and artifactual infrastructure for these knowledge systems to physically exist and 'live' on. This permits earthen architecture to gain an almost unparalleled status of one among the continent's biggest 'social resources' for communicating knowledge systems, sustaining indigenous education, related customs and traditions accumulated right from pre-Colonial times. In its intrinsic simplicity, Ugandan earthen architecture is, hence, a foremost material embodiment and reflection of people's values, perceptions, identity, aspirations, goals, etc.





Fig.1 Earthen architectural wall semiotics at Kitintalo, Tirinyi District, Uganda (credits: Allan Birabi, 2010)

Despite its declining potency and level of significance, earthen architecture continues to act as one of the most reputed mediums for transmission of Uganda's local indigenous knowledge systems. Yet it is fast disappearing due to flimsy patronage for its continuity, together with the disorienting adaptation to globalization and a number of other erosive forces. In fact, some of those knowledge systems have already been lost forever. Hence, it became a point of justification to write this paper in order to contribute to awareness about these knowledge systems as an urgent trigger for documenting and revitalizing their continuity. The lynchpin of this endeavor is the subject matter of the next subsections by means of some selected Ugandan cultural landscapes, rich in these knowledge systems, and related built environments.

Methodologically speaking, the paper developed out of combined qualitative social approaches of the Investigator/Theoretician (External Mode) and the Local Community Mode (Internal Mode) of investigation and interpretation. The Investigator/Theoretician Mode was the source of theoretical perspectives upon observing the community for some time, coupled with exploration of theory and related literature on the subject. Alongside, the Local Community Mode produced socially constructed experiential and/or practice-based explanations of how people add meaning or value to their architectural configurations. Within this combination, data-collection techniques spanned a scan of primary and secondary sources, interviews, participant observation, physical information, and photography within the Ugandan cultural landscapes that were selected for their richness in those knowledge systems.



Fig.2 A close-up detail of Figure 1 showing abstract floral and faunal elements (credits: Allan Birabi, 2010)

## 2. NATURE AND CHARACTER OF THE SOCIO-CULTURAL KNOWLEDGE SYSTEMS PREVALENT IN EARTHEN ARCHITECTURE

By means of the information-oriented sampling technique rather than direct random sampling, a series of explorative field trips across salient localities with surviving earthen architectural ensembles were scrutinized. In this connection, apparent owner-occupiers of the samples gained the status of potential interviewees on grounds that they were a source of primary data concerning the targeted earthen-architectural fabric and related knowledge systems' embodiments. Since the narrative, explanatory and descriptive account about the nature and character of those earthen architecture-driven knowledge systems necessitated accompaniment of considerable visual interpretation, the main text of this paper is juxtaposed with a corresponding photographic illustrations.

Embarking on this main focus, therefore, creators of this knowledge-radiating architecture, who in most instances are self-taught indigenous 'artist-architects', have experientially and intuitively evolved what Barabanov (1997) refers to as an imaginative, socio-spatial, resourceful, and productive accomplishment of depositing indigenous-knowledge systems in walls of earthen architecture. By means of the exceptional power of engaging their artistic expertise, such indigenous exponents also double as socio-ethno-cultural communicators. The illustrations below depict one such exemplar of a house at Kitintalo, in Tirinyi District of eastern Uganda, with picturesque wall semiotics of bright muralist distinction and graphic accomplishment rooted in typical mixed African ethno-mathematical and decorative aesthetic. The bands of combined rhythmic, pluralistic and gently undulating lines stir up a tranquil musical sensation. The multiplicity of the lines is organically synonymous with plurality of contrapuntal voices and cross-rhythms, in juxtaposition with silent 'offbeat' and the sounded 'on-beat' instrumentals of indigenous Ugandan music (Collins, 2004). It is a sort of musical multiplicity infused in the wall semiotics. Notably, the alliance between indigenous African music and architectural semiotics is traditionally instinctive and free of any compartmentalization between the two specialties.



Fig.3 Floral and dot semiotics at Nakalama, District, Uganda (credits: Allan Birabi, 2010)

It is no surprise that this artisanal syncopation and 'jazzing' of Ugandan earthen-architectural semiotics with such musical impulses enriches this extravaganza of visually recognizable knowledge systems. As represented in detail, the inclusion of varied abstract faunal and floral elements, each radiating a message but mutually contributing to an overall bigger knowledge-driven meaning, draws parallels with modern know-how of multimedia communication as well. The essence of adorning the house with this whole wall of semiotics is the artisan's skill for drawing in the viewer to circle the entire building for maximum enjoyment. Through their practiced minds, hands and eyes, the artisans turn earthen-architectural ensembles into living socio-cultural encyclopedic depositories, open-air galleries and/or museums rich in a vast array of indigenous-knowledge systems.

It is apparent that subject matter is wide-ranging across aspects of beauty, fertility, birth, marriage, love, family-hood, appreciation for nature, music, gender, heavenly bodies, social order and status, social ceremonies/customs/traditions, hunting, agriculture and political power. It also spans religion, fortunes and misfortunes, excellence, proficiency, talents and others.

Expression of these varied subject matters is frequently augmented by ethnomathematical imaginativeness that is also cross-pollinated with organic geometry. For instance, from dialogue with the artisans who executed the wall semiotics, the subject matter was in respect of love for nature. In fact, nature appears to be the most influential source of subject matter for Ugandan earthen-architectural wall semioticians. Accomplished at times from a palette of pure traditional earth colors, and in some instances from a combination of the traditional pigments and some modern industrially prepared paint, the earthen-architectural wall semioticians also propagate a considerable bulk of color-driven knowledge systems that are characteristically tools of instant emotional, psychological, and inspirational



Fig.4 Floral semiotics dominated by sensual red at Muwayo, Busia District, Uganda (credits: Allan Birabi, 2010)

communication. In this context, a variety of neutral tones of gray, beige, and taupe are often in rich dramatic concert with considerable shades and values of red, orange, brown, green, blue, purple, etc. In fact, local Ugandan clays are a source of diverse colors ranging from dark volcanic vertisols, and oxidized reds, to luminous creams as well as sparkling white kaolins. They are commonly retrieved from flood plains, mountain slopes or deposits.

Coined by Brazilian mathematician Ubiratan D'Ambrosio in 1977, ethnomathematics is essentially defined as the cognizance of mathematics that considers the culture in which the given mathematical contexts arise by understanding the reasoning and the very mathematical systems in use (Ascher, 1991; Zaslavsky, 1991). What came forward from the observations in the field is what can best be termed 'African ethnomathematics' rich in its own peculiar fractals. A fractal is a pattern that repeats itself at different scales. Noted for its wide application in Africa for several centuries, the realization is that the fractal element is a strong and popular component engaged by indigenous Ugandan architectural semioticians not only in their earthen wall semiotics' compositions but also in other artistic design pursuits such as pottery, mat-weaving, ironmongery, sculpture, beadwork, jewelry, leather crafts, furniture making, hairstyling, basketry, tapestry, mat-weaving and more.

Within the earthen-architectural wall-semiotics context, the illustration below is one among numerous other exemplars traced on a house at Bugiri, Eastern Uganda. With a powerful intuitive sense of fractal ethnomathematics arranged with meticulous strip patterns, repetition is by means of combined vertical, horizontal, or glide reflections. Glide reflections are the result of the artisan maneuvering a fractal or unit of design in one direction for a definite amount of distance. This process is then repeated to cover the predetermined wall area.

To gain insight into the intricate ethnomathematical and





Fig.5 Detail of some floral wall semiotics in a house (credits: Allan Birabi, 2010)

ethno-geometrical-knowledge systems behind the respective fractal-strip patterns, an abstract synthesis of the semiotics led to the interpretation depicted above. The top row is based on a two-color rectangular pattern, which without reflection or rotation, is plainly reproduced or glided to the right over the length and direction of the arrow. The sequence is then repeated over and over again. The same arrangement is applied to the pattern work in the second row. In the third row, the red box is representative of the unit of design as an ethnomathematical concept of the artisan. In a tri-color pattern, it comprises of eight triangles adjacent to one another in reverse directions. A horizontal but alternately flipped translation to the right of the eight triangles, as indicated by the curvilinear arrows, propagates the pattern.

Another stylish exemplar of Ugandan earthen ethnomathematical-wall semiotics was reviewed at Magodes in Tororo District. With sophisticated tessellation geometry, coupled with design elements of line, color, dramatic contrast, and organizational ethnomathematics, the artisan registers a commendable degree of superb interplay of mixed color pattern and textural charisma to turn the mere flat wall into a somewhat ‘wise’, energetic, musical, and educative surface.

The above exemplars of both fractal and non-fractal geometrical wall semiotics are but just a sampling of the extensive socio-cultural knowledge systems that prevail in Uganda’s rural countryside. To the artisans, fractal geometry is a kind of ‘instinctive mathematics’, which modern formal engineering expertise now endeavors to decode. Validating this observation, Eglash (1999) substantiates that while fractal geometry has contemporarily opened up great heights of high-tech science in many parts of the world, its roots are startlingly far-reaching in indigenous Afro-centric designs, and a considerable amount of its codes are elementary among most African socio-cultural knowledge systems. Hence, while fractal designs prevail beyond Africa as well (Celtic knots, Ukrainian eggs, and Maori rafters have some excellent examples), they are not everywhere. Their conspicuous incidence in Africa (and Africa-influenced southern India) is quite explicit.



Fig.6 Strip-pattern semiotics at Bugiri Uganda (credits: Allan Birabi, 2010)

2.1 The value of earthen architecture-driven socio-cultural knowledge systems

Holistically, the walls of Ugandan earthen architecture are ‘loaded’ with semiotic messages beyond the basics of architectural functionality and firmness. They offer lessons, amusement, and inspiration. With their given intensity, vigor and magnitude, they also create a sense of pride and honor to the owner-occupiers of traditional earthen-built environments. Bred among communities that have come to learn how to compensate for some of their past non-writing, non-reading and/or non-formal educational legacies, the Uganda artisans organically transform bare earthen walls into sort of graphical multi-narrative ‘painted books’, which constitute open-access community libraries. Thus, as a unique community-based, community-centered, and community-driven cutting edge of indigenous-pedagogical excellence, Ugandan earthen architecture is a unique symbolic resource with which the locals discover, recreate and exchange ideas, experiences, meanings, and add avenues of social interaction (Halliday, 1977; Kress and Van Leeuwen, 1996). In an intriguing relationship, while the inherent knowledge systems are bound in the earthen architecture and so can educate and enrich the onlooker, they also double as propagators of ‘information value’ of what would otherwise be barren earthen walls of this architectural fabric (Van Leeuwen, 2001). It is, therefore, apparent that local Ugandan earthen architecture is a special ‘encyclopedic deposit’ of indigenous-knowledge systems through semiotics’ monumentalism, iconism, and/or symbolism. It remains the most powerful medium by which their creators inter-disciplinarily double as philanthropic social scientists. They engage their work in a moral contract between architecture, citizenship, indigenous knowledge and education, society and development.

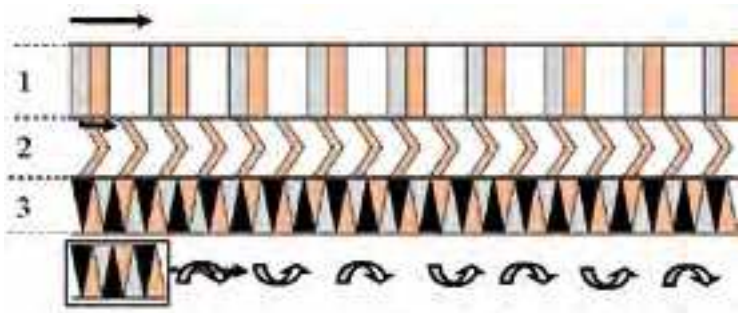


Fig.7 Abstract synthesis of the ethnomathematical knowledge systems present in Fig. 6’s strip-pattern semiotics (credits: Allan Birabi, 2010)

2.2 Threats to the knowledge systems and to earthen architecture

These knowledge systems are under severe threat, however. This observation unfolds the realization that the conditions that made these knowledge systems likeable and effective in the past are no longer prevailing. Among the threats is the fact that it is practically hard to conserve the earthen-wall semiotics because of the very nature of non-permanence of this architectural fabric vulnerable to both organic and inorganic deterioration. The semiotics are eroded, for instance, by Uganda’s heavy torrential rains. Furthermore, frequent flooding directly curtails the perennial nature of earthen-architectural ensembles and their wall semiotics. There is also the problem of mechanical injury to the walls containing the semiotics particularly by domesticated animals, which are common in most Ugandan earthen-architecture homesteads. For instance, cows and goats frequently rub their bodies on the walls and in so doing the precious wall semiotics are destroyed. Also, it is a popular move to renew the walls with fresh clay to rejuvenate homesteads. Consequently, faded semiotics are replaced with new ones without documenting previous schemes of wall semiotics. At times, there is no replacement at all and all this valuable knowledge just disappears. In addition, hardly any technology for preserving whole-wall fragments exists. Furthermore, threats also arise from ignorance and obsolescence connected with mindsets, fast-paced globalization, eroded artisan-craft skills, altered cultural tastes and preferences.

Notwithstanding the above-enumerated threats, the earthen-wall semiotics represent material and symbolic depositories of ideological and functional values established over past centuries, and are lynchpins for granting a given neighborhood with distinctive physiognomy, i.e. making a given neighborhood more attractive and different from others (Gospodini, 2002). Apparently, physiognomy cultivates satisfaction/enjoyment to owner-occupiers and/or visitors for each given neighborhood, thereby transforming some neighborhoods into ‘cultural-heritage landscapes’. Such landscapes are characterized by knowledge systems manifested by attendant architectural semiotics by way of



Fig.8 Earthen-wall tessellation semiotics at Magodes, Molo, Tororo District, Uganda (credits: Allan Birabi, 2010)

visual consumption, and celebrating something that strong heritage components remind them about themselves and their past. In this regard, without necessarily ranking them, Throsby, in Avrami et al (2000) corroborates associated-value embodiments to include:

- 1. Educational: imbedded knowledge, messages, information;
- 2. Aesthetic value: beauty, harmony;
- 3. Spiritual value: understanding, enlightenment, insight;
- 4. Social value: connection with others, a sense of identity
- 5. Historical value: connection with the past and/or evocation of the notions of memory and time;
- 6. Commemorative/symbolic value: a repository or conveyor of meaning;
- 7. Technical and intrinsic: architectural or artistic merit;
- 8. Inspirational: artistic, scientific, philosophical, poetic insights and innovations, visual ambience, cultural vitality, post-conflict identity reestablishment;
- 9. Intrinsic value: imbedded in the walls respectively, architectural semiotics and attendant knowledge systems arouse intrinsic value as the fabric of human achievement essential to the wellbeing of the ‘soul’ and culture of a given host community.

Looking back, therefore, the case for documenting socio-cultural knowledge systems prevalent in earthen architecture is plausibly an urgent matter, which is the focus of the concluding section of this paper.



3. CONCLUSION: THE URGENCY OF DOCUMENTING THE SOCIO-CULTURAL KNOWLEDGE SYSTEMS PREVALENT IN EARTHEN ARCHITECTURE

In the contemporary modern context, it cannot be doubted that sound documentation lies at the heart of the urgency of preserving and utilizing the indigenous-knowledge systems harnessed in earthen architecture that have emerged in previous sections of this paper. As a conclusion, therefore, now is the time for more in-depth studies coupled with protecting and publishing about these neglected architectural semiotics. By means of this strategy, preserving Ugandan earthen-architecture-driven indigenous-knowledge systems is poised to become a pragmatic experience replicable in other cultures with similar or comparable knowledge resources. Local knowledge gurus would then have a tangible basis for accurately uploading their formal education enterprises with indigenous-knowledge templates. In this regard, Ma Rhea (2004, p.5) states:

“Accurate documentation also enables nations and other interested parties, such as national systems of education, to enter into agreements and contracts with traditional knowledge holders that will strengthen the capacity of these communities to develop economically sustainable livelihoods and see their knowledge included in national education systems.”

However, documentation of these knowledge systems requires patronage from political intelligentsia, educational

policymakers, and academics, all of whom at the moment seem to be passive on this matter. In a related synergy, managers of Uganda’s postal services, who take charge of producing postal stamps, could champion a publicity drive for some of the exemplary local indigenous semiotics’ design splendor by using their respective images on postage stamps. It has often been an odd occurrence in the past to see Ugandan and, indeed, other African countries produce postage stamps with images celebrating knowledge systems and/or monuments of, for instance, their past Colonial masters, instead of bringing forward such powerful heritage of their own.

It is the opinion of this author as well, therefore, that it would pay off to co-mingle the above-enumerated synergies with some modest-scale public prototype-building projects in modern contexts that stand out to radiate knowledge or developmental messages to the people. Such archetypes can be commissioned by governments in collaboration with architecture schools, artisans, museologists, social scientists, conservators, etc. Furthermore, cultural departments of the State can liaise with museologists in unfolding regional heritage buildings, museums or galleries that promulgate the conservation of outstanding earthen-architectural semiotics, as well as other diverse heritage material. It is no doubt that such synergies would trigger greater spin-off influences that would further augment the character of stylistic contemporary and future culturally driven built environments.

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SURFACE PROTECTION: CONSERVING THE RELATIONSHIP BETWEEN ARTIST AND MATERIAL IN ISFAHAN AND TCHOGHA ZANBIL, IRAN

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Theme 5: Local and Regional Knowledge, Intangible Heritage and Social Impact  
Keywords: Surface protection, intangible heritage

Abstract

Surface protection of Iranian earthen architecture has been continuously accomplished with a variety of decorative covering materials based on traditional symbolism and vernacular aesthetic, which reflect two general principles: high flexibility and sacrificial decorative material for protecting the inner meaning (the spirit) of the architectural space. This cultural phenomenon enjoys strong theoretical foundations, as well as technical skills that are transferred by generations of traditional artists through specific training patterns in the process of repair and maintenance of historical buildings. Considering this issue is essential to achieve a holistic approach towards the tangible and intangible dimensions of historic earthen architecture. This paper presents the experiences of conservators and local craftsmen in evaluating the state of transferring this intangible heritage during the conservation programs in historic (Tchogha Zanbil) and traditional (Isfahan) environments. A four-year program of evaluation and cooperative interviews shows that the conservation workshops have provided a supportive field for rethinking vernacular knowledge of construction.

However, in the absence of a common language among younger and older generations of local artists and conservators for exchanging the ideas about cultural values, their cooperation may be reduced into a few technical details. In order to present the intangible values of traditional maintenance to the conservators, promoting these traditions among the younger generation of craftsmen, and recognizing the craftsmen not as technicians but as creative agents in the conservation system, practical measures were proposed. These measures include participation of local artists in developing conservation-management plans and publications, dedicating virtual spaces for introducing local repair systems to the public, and promotion of creative and critical approaches towards conservation technology through the joint participation of local artists and conservators in training workshops.

1. INTRODUCTION

Surface protection – covering the adobe structure with sacrificial materials, such as mud plasters or decorative ceramic layers – has been frequently used by Iranian traditional architects in order to maintain earthen buildings from environmental degradation, e.g. rain, abrasive sand particles in desert winds, etc. (Houben and Guillaud, 2003, p. 334).

Due to gradual deterioration, these coverings need to be replaced at certain intervals, which depending to the type of the covering or its location in the building, vary from a few years to decades. This continuous maintenance is a part of its architectural style (Falamaki, 1986, p. 26). Therefore, the vulnerability of adobe has become an opportunity for manifesting intangible forms of heritage through the relationship between local artists’ ideas and the dwelling spaces of earthen material. Establishing such a relationship would not be possible without a comprehensive knowledge of architectural space, decorative-preservative layers and the dynamic interaction of the two in the passage of time. During the recent decades, social changes and fading of the local cultural values in design of contemporary architectural forms has led to the neglect and loss of traditional maintenance methods, which affects the continuation of social life in historic urban textures and the conservation of outstanding cultural monuments.

Because the most important characteristic of intangible heritage is their reproduction from time to time, training and transferring the concepts necessary for the accomplishment of these reproductions became the concern of conservators, especially after the definition of intangible cultural heritage