Keywords in English (used place in the Venice Charter text, 1964)		New rethinking view points on heritage conservation in earthquake zones
Concepts & Heritages	Authenticity (Preamble, P)	The Nara Document 1994, diversity
	Historical evidence (Article 3, A)	History coexisting with earthquake
	Living witness (P)	Witness of earthquake disasters
	Message from the past (P)	Earthquake-disaster history
	Own culture and traditions (P)	Culture coexisting with earthquake
	Principle (P)	Principle prepared for disaster
	Traditional techniques (A10)	Techniques prepared for disaster
	Modest Works of the Past (A1)	Sustainable living heritage
	Monument (P, A2, 4, 5, 6, 7, 9, 11, 14, 15)	Periodic earthquake recovery
	Urban or Rural Setting (A1)	Sustainable living heritage
Conservation Actions	Anastylosis (A15)	Earthquake disaster and recovery
	Conservation (A2, 4, 5, 6, 10, 14, 15)	In history, coexisting with disaster
	Restoration (P, A2, 9, 11, 12, 14, 16)	Periodic earthquake recovery
	Consolidation (A10, 16)	Periodic earthquake recovery
	Construction (A6, 10)	Conservation work for the next quake
	Indispensable extra work (A9)	Periodic earthquake recovery
	Modification (A6)	Consolidation for the next quake
	Reconstruction work (A15)	Sustainable living heritage
	Replacement of missing part (A12)	Periodic earthquake recovery
	Replacement of missing part (A12)	Consolidation for the next quake
	Use of any modern technique (A10)	Periodic earthquake recovery

Table 2. A proposal of rethinking the meaning of key words in the Venice Charter in 1964, respecting the disaster-recovery history of heritage located in earthquake zones (credits: Masuda and Mendoza Shimada, 2011)

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HARNESSING POLITICAL AND TRADE STRUCTURES TO ACHIEVE STANDARDS FOR EARTHEN BUILDING IN SOUTHERN AFRICA AND BEYOND

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Theme 8: Charters, Standards and Guidelines for Heritage and Construction
Keywords: Standards, acceptability, low carbon, emissions

Abstract

Following the adoption of the Code of Practice for Rammed Earth Structures by the Standards Association of Zimbabwe, it was decided to harmonize Standard by two regional blocs. Both COMESA (1) (19 countries) and SADC (2) (15 countries) agreed to do so but in practice, SADC was chosen to move the process forward. Four years on and the group is working with 10 of the 15 countries and have brought the process to the final voting stage for harmonization. On acceptance, people in 15 countries will for the first time be able to build earthen structures in urban areas under standards published by their own country.

It seems that using the existing trade and political structures of regions is easier than single countries, and that earthen construction has to learn the language of international-trade agreements. It was decided to look at changing the restrictive building codes and building regulations through the language of global-standards systems; concepts such as Technical Barriers to Trade (TBT's) may prove easier instruments to change than previous work with organizations already in the field of construction and materials.

However, this approach requires that members of states and of regions take up their position as stakeholders and use the existing apparatus to change the regulatory scenario, which has prevailed up till now. In this way, the acceptance of earth can be changed, as a useful economic tool, a viable construction material, a mean to increase employment and of reducing harmful greenhouse gases, from one of negative perceptions to one of positive adoption.

Much of the groundwork has been laid out, not just by people working with earthen architecture but also by international institutions, such as the International Organization for Standards that needs to be engaged.

1. INTRODUCTION

Rammed Earth Consulting CIC, an independent earthen-building company in the UK, and the School of Architecture at the University of Pretoria have been collaborating on the SADCSTAN (3) harmonization process for the Zimbabwe National Code of Practice for Rammed Earth Structures since 2008. In the Southern African region, there is still an extant knowledge base of earthen building in rural environments and urban peripheries, but apart from Zimbabwe, planning and legal systems in built-up urban areas of the SADC region legally prevent people from using any earthen-building technology, in this way not only preventing tenure and access to financing of built property, but also any chance of effective inter-generational transfer of vicarious knowledge and skills of a range of earthen construction.

From different perspectives, the authors have come to a shared realization of the urgency to create the legal environment for the use of rammed-earth technology, on the one hand as a conservation strategy to provide a supportive-future context for a range of tenuous indigenous-knowledge systems relating to all forms of earthen construction to survive and be transmitted into the future, and on the other hand as a strategy to allow these technologies to play their part in a global strategy towards achieving urban densities using low-carbon emission construction methods. At present, the main thrust of these strategies is directed towards the regulatory environment in earthen construction. This paper demonstrates the complexities of achieving the legal right to build, live and work in earth in urban areas.

2. BACKGROUND

Following the adoption of the Code of Practice for Rammed Earth Structures by the Standards Association of Zimbabwe (SAZ, 2001) (Keable, 2011), there was a six-year hiatus in

activity in that region. But after the publication of the UK Rammed Earth, Design and Construction Guidelines (Walker, Keable, Martin, & Maniatidis, 2005), a dialogue started with the Standards Association of Zimbabwe (SAZ) to harmonize the rammed-earth standard through the regional blocs. Both COMESA (19 countries) and SADC (15 countries) agreed to do so. For a number of reasons, SADC was chosen to move the process forward.

Reasons for choosing SADC include lack of funding, building consensus takes time, travel and money. Firstly, SADC was founded as a political organization, whereas COMESA began as a loosely formed trade body. Secondly, and perhaps counter intuitively, the more political SADC have moved trade, standards and the removal of barriers to trade faster and more effectively than have COMESA. Finally, SADC includes South Africa, which as one of the three economic powers of the continent, which was perceived as being the most likely to join the process and, thereby, to wield a great influence over the other two, namely Egypt, and later on Nigeria.

Four years on and the group is working with 10 of the 15 countries, Botswana, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. For the moment, the process has passed five of six voting stages for harmonization.

On acceptance, people in 15 countries will for the first time be able to build earthen structures in urban areas under standards published by their own country. The legitimacy that this brings will, inter alia, allow schools to be built using earth for the first time, as any school is classified as an urban area.

3. STANDARDIZATION

The technical process of harmonization has changed over the period, since the work has been developed with SADCSTAN, which has brought both threats and opportunities. On the threat side, there is the fact that systems have changed and transparency is low. So discovering the status of any particular project to harmonize a standard may take weeks, or even months. The timing of this information may prove to be crucial, as work items may be dropped due to technicalities before the relevant stakeholders have any idea that there is a problem.

The only way to mitigate these kinds of issues is by building networks within the national standards bodies, by keeping communicating with them, and this may mean travel around the region to ensure that information is current. One of the reasons that projects may be dropped and another threat to the process is funding for and with SADCSTAN. After having enjoyed good funding from the EU over a number of years, this has now been severely scaled back, a situation apparently unforeseen by SADC members. As a result, a number of projects were dropped in early 2011 for having taken 'too long'. Our document was one of them, it had been agreed to four years ago, but the country secretariat dealing with the project, Botswana, did not issue the document to the other member states for 18 months. These kinds of blockages have only been removed by active participation on our part as national stakeholders to the process.

On the positive side, the opportunities have also increased if the harmonization is successful. It is now agreed that, once harmonized, all standards immediately take precedence over all previously existing standards (this does not apply in this case as there are not any) but that they also take immediate effect, so that all member states will be obliged to publish and abide by the new standard. There is also what is known as the tripartite agreement between SADC, COMESA and EAT, which should greatly reduce the time a harmonization process takes in any of the other two regional blocs once one of the three has successfully harmonized a standard.

The above machinations and interventions may seem like academic trivialities, but if these small interventions and machinations are not continuously managed and reinforced towards an accepted regional-regulatory standard, both the global-heritage community's good work on protecting earthen-building knowledge and skills and the scientific community's good work on advancing earthen-building technology will come to naught – without standards for earthen construction at the national, continental or global levels, it will continue to languish outside of common usage for most.

The rate of urbanization in Africa is the highest in the world – at the same time formal systems of housing and infrastructure provision are failing, resulting in a growing reliance of informal methods of providing these (Ogbu, 2009; Bakker, 2009). Most rural immigrants to the city currently still possess knowledge of earthen building, but a next generation may have lost this. The almost exclusive use of cement and concrete for buildings in African cities is growing exponentially and is vigorously promoted by the large global-cement companies from both the West and the East, but Africa will have to bear the costs of the long-term environmental impacts and un-sustainability of these short-term gain initiatives.

4. PRODUCTS AND PROCESSES

The growth of standards and building regulations has been rapid and global over the same period that commercial-construction products have increased from being a relative rarity to a global norm (Yahya, Agevi, Lowe, Mugova, Musandu-Nyamayaro, and Schilderman, 2001). The use of cement has been brought from a product to a norm for a variety of reasons. The production of cement, as with much of industry, is capital intensive, and so many governments around the world, seeing it as a strategic good, have also been major shareholders in the production process. This coupling of state and commerce has led to a rapid adoption of building regulations, which proscribe the size and strength of all built elements from foundations to lintels, homes to factories, schools and clinics. In many cases, the absence of a common code and standard was the driver of the process and is understandable. Additionally, cement is now recognized as responsible for around 10% of global human CO2 emissions while still remaining the preeminent state regulated and prescribed material (Keable, 2010). However, with the rapid growth of products in construction, the process has led to many building types, which follow process rather than to use a product have fallen out of the regulated arena.

The link between products and standards is multi-facetted. There is a political dimension to this: governments wanting to control where and how building development takes place, where one group of people live relative to another group, the types of materials to be used and the flow of revenues that result. But companies also have a big say in the standardization of their products, and they bear the cost of doing so. In the case of processes, which may have been in existence for hundreds or even thousands of years, there is not necessarily a sponsor ensuring that the particular process or practice has a space in which to operate in a modern market. Companies are also increasingly targeting schools of architecture through the medium of design competitions to focus on standardized-building products, especially steel and cement, which in turn has a diminishing effect on the richness of syllabi and the eventual approach to architecture and construction, as well as the quality of the bio-physical environment and socio-cultural environments.

This, is a major challenge to the earthen building and conservation community, to provide that vital role of sponsor advocate to practices, which have ancient provenance but which have been left out of (very often) Colonial practice, and have failed to find a voice in the post-Colonial era and a critical role in ensuring greater environmental quality for future generations and helping to arrest climate change.

5. NEXT STEPS

The authors have stressed the importance of efforts to conserve knowledge and skills in earthen construction, as well as continuous research and experimentation with traditional and new earthen-focused technologies and additive materials, but have also demonstrated the extreme urgency for achieving a supportive-regulatory environment and harmonization.

In this endeavor for the SADC region, there are several next stages in the process once harmonization is achieved in the 15 countries comprising SADC. Of course, there is a big job to be done in the wider dissemination of the new national standard in each of the countries concerned. In some, this will have natural advocates, people and organizations already in the fields of construction and conservation that are aware of this technology. Countries like South Africa, Namibia and Mozambique have vocal opposing lobbies that have to be countered. In other countries where dissent from prescribed norms has been thoroughly quashed – such as Malawi – the job has fewer local advocates and may take time to root. And other situations – such as Angola, so long gripped by war and poverty, and where building control was very low on the list of government activities but now prosperous once more – the task is immense.

But there is also an ongoing regional dimension to this work. Clearly, rammed-earth is but one of a family of technologies, which have been overlooked by successive generations since the introduction of product-based norms. In the past few years, the normative growth in earthen construction has grown rapidly from a very low base. The adoption last year of a non-prescriptive ASTM in the USA covering all forms of earthen construction implicitly or explicitly is a major step forward. Many countries in the SADC region for instance have MOUs with ASTM and could form technical committees to adopt this code. It is recognized that for many people, the idea of a standard for earthen building is strange enough, but the need for two is absurd. But, however, that may be once a single earthen-building standard is in place in any country, it will be much harder to prevent the next one and the next one.

As stated above, COMESA already agreed to the rammed-earth standard and it should be somewhat more straightforward to do so once SADC has completed the process. Other organizations, such as the West African bloc ECOWAS, may also then follow suit. ARSO, the African regional-standards organization, likewise may have a part to play.

6. PROCESS

The interesting thing about standards is that they require the participation of stakeholders. This is what gives them their legitimacy. This legitimacy may be largely national, as in the case with Zimbabwe, or may also include international cooperation. The working group peer-reviewed the ASTM standard, as did many others in the global community.

This process has to be understood and engaged with, by the international earthen-architecture community. The language of technical barriers to trade, of harmonization, and the resources to engage with the process need to be embraced. There is a dynamic in the organization of local knowledge and advocacy and the input of international learning and experience, which could be both powerful and swift. At present, technical committees tend to be engineering and technocratic in form and substance. Ministries and corporations, who can afford to stack the committees, end up being the arbitrary arbiters of technologies of which they know little or nothing. But when local knowledge groups in the professions, built-environment related tertiary-educational institutions, NGOs, communities, construction and conservation groups are mobilized to seek a presence on these committees, the effect can be startling.

If Terra is to have a lasting effect, it would be in the promotion, advocacy, global management and oversight of this process.

7. CONCLUSION

In order to begin the long job of building acceptance for earthen structures in Africa, it will be necessary to address standards and regulation issues. This means both writing and adopting guides and norms for earthen building, but also redrafting norms written for materials like cement, norms that have mysteriously come to apply to all other materials.

This is a process that takes time. It is a process which is not well understood and which is changing fast in the African context. Regional agreements mean single-country codes can now be harmonized by many countries, and enjoy immediate force in law. When the standards are generated in the region rather than parachuted in from elsewhere, there may be particular interest and willingness to uptake.

This process has been largely unfunded and a labor of dedication, but it is critical that through pressure from those working in this field, its significance should be better understood by funders, and that the current emphasis on research is strategically shifted to standards dissemination until that goal is reached.

Because earthen building is still proscribed in towns and cities, and millions still have no choice but to live in shacks from found materials because standardized materials like cement are completely unaffordable, and because professionals in the built environment are not educated to see earthen construction as acceptable or viable, it is imperative that the legal tools are put in place to allow millions, the dignity to legally procure decent, affordable, environmentally sound and sustainable earthen schools, clinics, commercial buildings and homes for the first time.

Notes

(1) COMESA: Common Market for Eastern and Southern Africa.
(2) SADC: Southern African Development Community.
(3) SADCSTAN: Southern African Development Community Cooperation through Standardisation.

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PROTERRA IBERIAN-AMERICAN NETWORK: HISTORY, INVENTORY AND PERSPECTIVES

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Theme 9: Education, Training and Outreach
Keywords: Network, Iberian-American, technological development, technology transfer

Abstract

The PROTERRA Iberian-American Network is a collaborative organization established in order to investigate, preserve and disseminate earthen architecture and its construction technology. It brings together over 100 professionals from 21 countries of the region in various research areas, such as teaching, design, construction, training and dissemination. The Network has published nine printed books, 20 CD-ROM and other electronic publications, and has promoted more than 60 courses and workshops, and over 30 conferences and seminars, among which 12 Iberian-American Seminars of Architecture and Earthen Construction (SIACOT) were accomplished under its direct auspices. Currently, the Network has a significant role in research and dissemination of earthen architecture and construction throughout the Iberian-American region, both from the point of view of conservation, as well as construction technology, and new architecture.

The origins of this organization began in October 2001, as an Iberian-American research project, supported by CYTED (Ciencia y Tecnologia para el Desarrollo), which led to interesting and unusual contributions to the discipline, particularly those that resulted in the creation of the Network at the end of the Proterra project, in February 2006. Since then, without any formal funding, the Network continues developing various activities from the initiative of its members, and has even increased the number of courses and seminars in relation to previous years, when working within a funded rese arch project.

The dynamism and interesting past of the Network led to the development of a study conducted in 2010 at the University of Oregon, USA. This paper presents part of the results of that study, which discusses the different activities accomplished by the Network, and incorporates also the oral history and actions of one of its members, as well as the first and the second Coordinators of the Network.

1. INTRODUCTION

Sustainable development and cyber space are perhaps the two most obvious features of the 21st century. Both are used by the PROTERRA Iberian-American Network, created to promote and raise awareness about earthen architecture and its construction, especially within the countries of the region. It started in 2001 with just seven members as a temporary four-year program. Known as the Research Project, it rapidly expanded with the association of other professionals involved in the subject. At the end of the project, the challenge of continuity was assumed by the Network, based mainly on common interest and volunteer work of its members. The story of PROTERRA, documented through papers authored by its Coordinators (Neves, 2006; Neves, 2010; Neves and Guerrero, 2010), as well as reports and newsletters, motivated the development of a post-doctoral level study, which sought to synthesize and analyze the activities carried out over time since the initial Research Project to its current networking activity.

2. PROTERRA IBERIAN-AMERICAN NETWORK

The current PROTERRA Network was named after the project that instigated it in the scope of the XIV Subprogram of Social Housing-HABYTED of the Science and Technology Program for Development-CYTED (www.cyted.org). The project Proterra began in October 2001 and was concluded in February 2006. As an "*international and multilateral technical cooperation project*" (Neves, 2006), it sought the transfer of scientific and technological results of earthen architecture and its construction to productive sectors and social policies of Iberian-American countries.

According to Neves and Guerrero (2009), its main forms of action included:

- Information and specialized distribution of the technology of earthen architecture and its construction;
- Exchange of information and experiences;
- Technical support to applied research projects;
- Capacity building and technology transfer at different levels;