

## SCARCE RESOURCES AS AN ENGINE OF AUTHENTIC SUSTAINABLE DEVELOPMENT

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### Abstract:

This paper is supposed to explain the connection between limited resources and the process of generating a sustainable architecture which is both authentic and accessible. After a contextual analysis of the mechanisms of the developed world that meet difficulties in creating scenarios for areal sustainable life, this paper concentrates on examining the ultimate situations that manage to adapt naturally to sustainable development requests.

These statements are relate to people living on the outskirts of developed society, to people living in the third world of underdeveloped countries or to people living in war zones or area threatened by natural disasters.

**Keywords:** sustainable architecture, limited resources, poverty, social progress

### 1. INTRODUCTION

Despite innovating technologies and up-to-date technology, despite the awareness of the limitation of resources, despite the behavior and the ethic of sustainability, seen and understood as a new spirituality, the developed countries remain large resource consumers and big polluters.

Robert Papier, a respectable analyst from the area of sustainable energy, claims that in the present situation of energy crisis, in which in the shortest time we will remain without traditional energy resources, is comparable with the situation of a burning house. The burning house scenario shows a picture with a lot of emotion, agitation, where there is a lot of shouting and pointing fingers, but very little action, nobody fetching water. At a close look, Robert Papier explains that all technologies based on renewable energy which are being promoted today don't solve the future energy problems.

In order to prove the following, Robert Papier analyses the case of renewable energy and that of bio-fuels.

In the case of wind (fig.1) and solar (fig.2) energy, the fact that these sources are not controllable they cannot supply energy equilibrium flow in the system.



Figure 1 – Wind turbines in Lower Saxony, Germany

Energy systems work in equilibrium. Every time sources of energy intake, such as a computer or a light bulb are opened, somewhere in the national energetic system, an energy quantity must be instantly supplied. In consequence, as much as we struggle –energy systems are based on supplementary adjustments. Conventional sources such as coal, hydroelectricity or nuclear power can assure these requests. Unfortunately, wind and solar renewable energy cannot be instantly available, because of the natural element dependence.



Figure 2. Solar-Testfield Widderstall, Baden-Württemberg Germany

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Besides, no efficient storage solution has yet been invented for this kind of energy. Nevertheless there are projects and promises that these sources can produce 20-50% of the necessary electricity. This statement though is self-deceptive, in the best case or a lie, in the worst.

Bio-fuels - an alternative as much promoted as the renewable electricity energies-have limited availability. Simply there is not enough biomass in any western society that could replace all the fossil fuel we currently consume (fig. 3). [1]



**Figure 3. Wheat fields for bio fuels, Kirtling Brook, Great Britain**

On the other side, another intention coming from the civilised world in order to live sustainable would be what we call recycling and it turns up to be something different from energy source saving . More than 16 years ago John Tierney, journalist at the science section of the prestigious NY Times affirmed in his article - "Recycling is garbage": *recycling is probably the biggest waste of resources in the US*. In another of his articles in 2005-"Recycling what a waste", Jim Fedako reminds us that in developed societies resource economy and reuse are efficient. But the economy of means and resources has never been obtained from the efficiency of ecological activities but simply through economical mechanisms of investment-profit orientation. Wood economy in the construction industry has grown significantly in the last 20 years, but this phenomenon occurred because of high wood price and in consequence, in rethinking the whole technology structure of the construction methods.

Concerning recycling, nobody can estimate the correct price of all factors involved in the recycling process (fig. 4).



**Figure 4. Glass and Plastic Recycling in Poland**

The simple observation that recycling doesn't produce profit determines John Tierney and Jim Fedako to declare that the cost of the recycling process expand beyond the benefits that may come out of it. The conclusions are simple-cost exceeds benefit regarding time consumption, money and resources .

Since recycling doesn't bring any profit, then, judging in economic terms, it is more efficient to simply use otherwise resources that are about to be exhausted: to conserve them or to develop technologies that reevaluate those resources.

Human actions direct the resources towards activities that meet the most pressing needs. This focus of resources means that those activities that are not the result of pressing needs are relatively expensive. Why? Those activities must compete with profitable activities, resulted out of pressing needs. The profitable activities will draw up the costs of the used resources, leading to bankruptcy all those activities that do not satisfy a stringent need. Imposed recycling is such an activity. [2]

The sole engine of such action remains the mental profit – the benefit perceived by those who practice this activity. Since recycling has become a statistical purpose, the environmentalists equate the costs of those activities by promoting them as pseudo-spiritual activities (fig.5).



**Figure 5. Enveloped house in solar panels, St Louis, USA**

Sustainable development isn't in any case a lifestyle, an obvious display of this statement of intent or an adherence to a new trend.

Enveloping your house from top to bottom with solar panels doesn't make it sustainable.

## 2.EXTREME POVERTY, VERNACULAR ARCHITECTURE AND SUSTAINABLE DEVELOPMENT WITHIN

Despite all innovative technologies and latest novelties, in the end sustainability means preservation; preservation of resources, an intelligent and moderate way of using them.

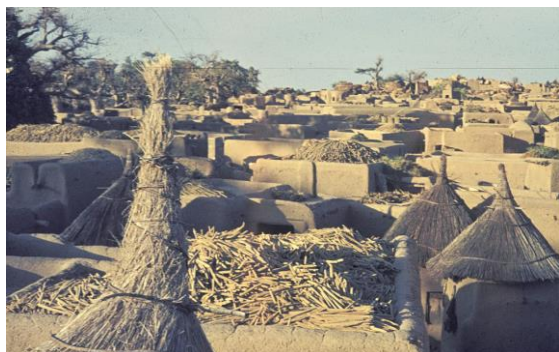
This is why sustainable development is for most inhabitants of the poor countries a question of survival.

In the case of the undeveloped world, of areas that have suffered natural disasters or the post-conflict



areas, the scarcity of resources is a matter of daily and acute awareness, directly related to survival.

The indigenous vernacular architecture always has a sustainable component. It is the direct result of experiment and it's only primordial purpose is shelter, making use of limited and local resources, revealing vernacular architecture the same with the green architecture. African vernacular architecture, for example, is sustainable: its materials have properties responsive to the local tropical climate. Mud is, for example, a material often used in rural African areas that with improved technologies could contribute to the development of sustainable residential communities (fig. 6, fig.7).



**Figure 6. Mali Mud Architecture**



**Figure 7. African Mud Architecture**

The practice of vernacular architecture must be encouraged, but in the same time it is necessary to reexamine and increase the efficiency of the technologies used in these practices in order for them to be effective and reaccepted.

The proportions of the general poverty, which is a global issue, are exceeding any imagination and the impact of the poverty is even more devastating than the impact of the global climate changes. The idea of the sustainability of the human race must be in fact the start point of every politics that concerns sustainable development, and the sustainable development must be seriously taken in consideration in our times.

In those countries in which the poverty is prevalent, the challenge of obtaining a sustainable development is bigger than in other countries because of the complex problems that concerns the overpopulation, the limited resources and the societal ills. In these underdeveloped countries, because of the extreme poverty, the sustainable development can be easily misunderstood and treated in a common or limited

way - like it only concerns environmental issues - this is a very dangerous and superficial way to interpret the concept of sustainable development.

As a direct consequence of the extreme poverty, people are inclined to use sub-standard construction materials (fig. 8) when they are making their houses and the projects are often made without the help of a professional help. So in order to be able to have a sustainable development in underdeveloped countries, the issue of poverty must become a priority [3].



**Figure 8. Slums in South-Africa**

However, the effort made to obtain a sustainable development is minimal and elusive in most of the underdeveloped countries, exceptions being made by those countries where the politics take into consideration the idea of sustainability as a long term project. The need of the sustainable development must be understand of being more than an environmental issue.

### 3. SOCIAL DIMENSION OF SUSTAINABLE ARCHITECTURE ACHIEVED WITH THE INVOLVEMENT OF PROFESSIONALS

In architectural terms, a sustainable building engages at least three types of development: the environmental protection, the economic development and, the most important, the social progress. [4]

That is the reason why the sustainable architecture must go beyond the sustainable capacities of the vernacular architecture. The sustainable architecture needs to take into account, to elaborate and assume a social dimension.

This is why non-profit organization "ARCHITECTURE FOR HUMANITY" approach proves to be successful completed and worthy to be imitated.

The non-profit organization "Architecture for Humanity" manages to prove the fact that sustainable development is essentially related to creating and strengthening the community spirit and to fighting and eradicating poverty. "Architecture for Humanity" has been created in 1999, along with the return to Kosovo of tens of thousands of refugees that remained homeless. Cameron Sinclair and Kate Stohr - the two co-founders of the organization have manage to co-opt respected architects from the whole world for designing emergency shelters, cheap, durable and

sustainable for the refugees (fig. 9, fig.10). From the proposed projects 4 prototypes have been build, together with the inauguration of the open platform Open Architecture Network – a data base containing hundreds of pro-bono projects, adaptable and sustainable, for houses, medical centers, community centers and even stadiums.



**Figure 9. I-beam Palette House, housing for the returning refugees of Kosovo , Suzan Wines and Azin Valy**



**Figure 10. I-beam Palette House, housing for the returning refugees of Kosovo, Suzan Wines and Azin Valy**

As seen, the projects haven't focused solely on sheltering the poor population, but have involved the rebuilding of the communitarian spirit.

In an opinion poll conducted in Afghanistan, trying to find out the opinion of the majority concerning the best recovery plan for the country, the most consistent responses where the necessity of rebuilding bazaars (fig. 11) and medical centres. What does this mean is that recovering a country equals recovering the spirit of community and restoring its physical health. [5]



**Figure 11. Bazaar in Afghanistan**

Martha Nussbaum, the American philosopher considers that affiliation is one of the central capacities of human beings. "Affiliation capacity is to be able to live with and among others, to observe and show concern for others, to engage in various forms of social interaction, to be able to imagine the situations through which the other person passes". [6]

Decoding poverty is not only trying to interpret the sources of income. Battling with poverty means also trying to recuperate the human capacity to live life whose motivations values must exceed the need of daily survival .For this reason, the approach of Cameron Sinclair and Kate Stohr is so important concerning durable development. Using cheap or recuperated materials, passive heating, natural cooling mechanisms, the group "Architecture for Humanity" succeeds in giving life and dignity to some dying communities trough the help of very small investments.

The AFH project - "Skateistan, Afghanistan's only skate park" (fig. 12, fig.13) is an indoor sports facility in Kabul, and also a school trying to develop and learn others the skateboarding abilities, healthy habits, civic responsibilities, information technology, art and foreign languages to afghan children.



**Figure 12. Skateistan, Afghanistan's only skate park**



**Figure 13. Skateistan, Afghanistan's only skate park**

The design full of consideration of the AFH projects - "design like you give a damn" tries to create long term changes within the communities

Thoughtful, inclusive design creates lasting change in communities by:

- Alleviating poverty and providing access to water, sanitation, power and essential services
- Bringing safe shelter to communities prone



- to disaster and displaced populations
  - Rebuilding community and creating neutral spaces for dialogue in post-conflict areas
  - Mitigating the effects of rapid urbanization in unplanned settlements
  - Creating spaces to meet the needs of those with disabilities and other at-risk populations
  - Reducing the footprint of the built environment and addressing climate change.
- [7]

Another example how to obtain a sustainable development, starting with limited resources and marginalized population, can be found in occidental policies (with special reference to United States and North-West European countries) of building social housing. In these programs, from the sustainability development point of view, the results are admirable most of the times, because of the general attitude that concentrates on long term interests.

In most of the cases, the client is a nonprofit organization who operates in a building in a long term manner. In these situations, there are real chances to find innovative solutions, even if the budget is low or the urban regulations are very strict.

An outstanding example of this is Jonathan Kirschenfeld Architects approach who manages to create dignified housing for the undeserved. The office builds on unusual, irregular, residual infill sites selected for his clients, their difficult geometries having rendered them difficult to market or build on. His clients are non-profit organizations dedicated to providing services and permanent housing to special-needs populations such as the mentally ill, formerly homeless, or people living with HIV (fig.14, fig.15, fig.16)[8].



**Figure 14. 2330 Bronx Park East, Bronx, 68 studios and supportive services for mentally ill and formerly homeless, Jonathan Kirschenfeld Architect**



**Figure 15. 614 Marcy Avenue, Brooklyn, 50 studios for formerly homeless, Jonathan Kirschenfeld Architects**

The construction of this so-called supportive housing is largely funded by federal, state, and municipal agencies. New York City zoning code regulates this housing not as Use Group R2 / Residential, applied to most forms of housing, but as Use Group R3 / Community Facilities, which includes not only supportive housing but other forms of housing managed by non-profit or governmental organizations such as student dormitories, housing for the elderly, or hospital staff accommodations. Finally, the minimum courtyard dimension is only 6,60m as opposed to the 9.10 m required in residential construction. It is only due to the fact that supportive housing is governed by these more liberal codes that Kirschenfeld is able to revisit archetypes and realize buildings on sites deemed undevelopable by builders of multifamily housing.



**Figure 16. 1401 Teller Avenue, Bronx, 43 studios and supportive services for mentally ill and formerly homeless, Jonathan Kirschenfeld Architects**

#### 4. CONCLUSION

Development and implicitly sustainable architecture cannot be a purpose in themselves. They are closely related to the quality of life that involves both living in a healthy natural environment, economic well-being and not least the social progress.

Access to scarce resources, whether they are material resources, financial resources or constraints imposed by building regulations, can create quality architecture with an authentic sustainable component, on the condition that these limitations are assumed by the professionals involved.

#### 5. REFERENCES

[1] *Institute for Integrated Economics*, Fake firemen - why are we cheating ourselves on energy? June, 26, 2010, , <http://www.iier.ch/content/fake-firemen-why-are-we-cheating-ourselves-energy>, accessed in 09.10.2012.

[2] *Fedako, Jim*, Recycling: what a waste!, September 22, 2005, , <http://mises.org/daily/1911#ArticleTab> accessed in 09.10.2012.

[3] *Sunday, Odebiyi*, Sustainable Housing Development in Africa: Nigerian Perspective, *International Business and Management*, Vol. 1, No. 1. 2010, pp. 22-30, [www.cscanada.net](http://www.cscanada.net)

[4] *Adams W.M.*. The Future of Sustainability: Rethinking Environment and Development in the Twenty-first Century. (2006), *Report of the IUCN Renowned Thinkers Meeting, 29-31 January*. ([www.iucn.org](http://www.iucn.org))

[5] *McCann, Kevin*, Architecture for Humanity: Ending Poverty by Design, November 9, 2009, <http://www.planetthoughts.org/?pg=pt/Whole&qid=3055>, accessed in 07.10.2012.

[6] *Nussbaum, Martha C.*, Women and Human Development – The Capabilities Approach. Cambridge University Press, New York 2000.

[7] <http://architectureforhumanity.org/about>, accessed in 09.10.2012. [8] *Schindler, Susanne* ,

Affordable Housing in New York, [http://www.bauwelt.de/sixcms/media.php/829/bw\\_2012\\_10\\_affordable%20housing.600101.pdf](http://www.bauwelt.de/sixcms/media.php/829/bw_2012_10_affordable%20housing.600101.pdf), accessed in 10.05.2012