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Vernacular approach to architectural design in a development cooperation experience with Mexican indigenous communities, / Pennacchio, Roberto; Nicchia, Roberta; Basile, Alessandra; Tulisi, Andrea. - In: JUNCO. - ISSN 2531-8772. - ELETTRONICO. - 1:(2014), pp. 237-244.

Availability:

This version is available at: 11583/2690961 since: 2020-09-15T19:18:51Z

Publisher:

University of Turin and Politecnico di Torino

Published

DOI:

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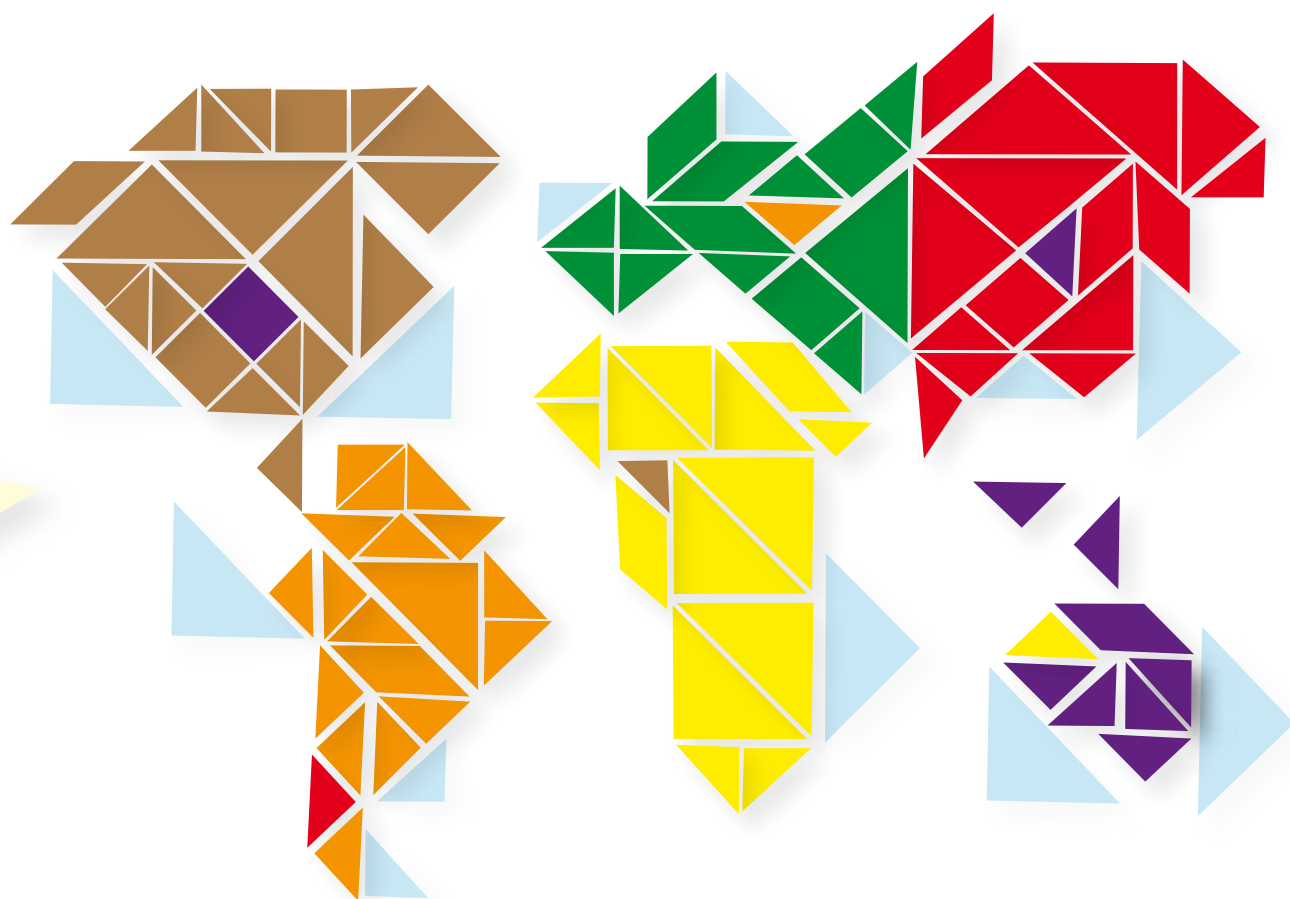
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**IMAGINING CULTURES OF COOPERATION:
UNIVERSITIES NETWORKING TO FACE THE NEW DEVELOPMENT CHALLENGES**

Proceedings of the III Congress of the University Network for Development Cooperation (CUCS)

Turin, 19-21 September 2013



**POLITECNICO
DI TORINO**



**UNIVERSITÀ
DEGLI STUDI
DI TORINO**

Egidio Dansero, Francesca De Filippi, Emanuele Fantini, Irene Marocco (eds.)

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JUNCO – Journal of UNiversities and international development COoperation,
n.1/2014

COLOPHON

Editors

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Graphic Design

Politecnico di Torino – CORE Office (Salvatore Lombardi, Giorgia Nutini, Elisa Tinozzi) with the support of Anita Stankova and Davide Cirillo.

Images

All images are provided by the authors unless mentioned otherwise.

Publisher

The Proceedings of the III CUCS Congress are published as a first special issue of

JUNCO - Journal of Universities and international development COoperation.

JUNCO is published by the University of Turin and Politecnico di Torino in the Open Access Journals' platform of the University of Turin: <http://www.ojs.unito.it/index.php/junco/index>

The Proceedings of the III CUCS Congress have been published with the support of the Department of Cultures, Politics and Society of the University of Turin.



ISBN 978-88-96894-16-3

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The Italian Universities Network for Development Cooperation (CUCS) has been founded in 2007 and nowadays includes 28 Italian Universities. The III CUCS Congress (CUCSTorino2013) was held in Turin on the 19th, 20th, and 21st of September, 2013. CUCSTorino2013 was co-organised by Politecnico di Torino and University of Turin in the frame of the growing partnership between these two Universities with other relevant development cooperation actors (the UN system, the Italian Ministry of Foreign Affairs, local authorities, foundations and NGOs and their respective partners in the so called “Global South”).

The Congress, titled “Imagining cultures of cooperation: universities networking to face the new development challenges”, focused on changes occurring at different levels on current development and cooperation trends (theories, policies, practices, and the definition of the Global Development Agenda post 2015), on the role of universities as development cooperation actors and their contribution in terms of research, education & training, solutions implementation in the field, technology transfer and co-creation.

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ISBN 978-88-96894-16-3



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VERNACULAR APPROACH TO ARCHITECTURAL DESIGN IN A DEVELOPMENT COOPERATION EXPERIENCE WITH MEXICAN INDIGENOUS COMMUNITIES

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ABSTRACT

Archintorno is a non-profit organization of young architects based in Naples, that has been promoting initiatives of development cooperation with indigenous communities in the Mexican State of Oaxaca since 2005. These initiatives involve universities, associations, local governments, and professionals in and outside Italy and rely on a didactic format, internationally known as Design-Build Studio, that includes the direct involvement of students from the Schools of Architecture and Engineering in designing and creating buildings in the developing contexts.

Our projects aim at using local materials and resources through low-cost, repeatable technologies, that are also consistent with local climate, social, and cultural context. Decisions on how to realize the projects are the result of a careful, shared analysis of lifestyles, housing culture, and local construction techniques. The cultural exchange between students and local populations is another relevant factor playing a major role in these projects. Therefore, in the context of the current debate about different approaches to architectural design in international cooperation, the experience of Archintorno is in close continuity with the local vernacular culture.

This article describes the strengths and weaknesses of the proposed approach through the analysis of the three cooperation experiences of Archintorno in Mexico. The topics discussed cover forms of participation and capacity building, project impact on the local community in terms of economic, socio-cultural, as well as environmental and landscape aspects, in addition to the transposal of technological and architectural innovations and may represent a starting point for discussion within the context of the community operating in this field.

INTRODUCTION

Although the use of prefabricated elements in architectural design in developing contexts of international cooperation is relatively common, differences between a design approach based on the principles of vernacular architecture and another approach based on prefabrication appear to be quite significant. Rudofsky uses the words “anonymous, spontaneous, indigenous, rural” [1] to describe the term “vernacular”. According to P. Oliver vernacular architectures are “related to their environments contexts and available resources, they are customarily-owner or community built, utilizing traditional technologies. All forms of vernacular architecture are built to meet specific needs, accommodating the values, economies and ways of life of the cultures that produces them.” [2]

Thus, a vernacular design approach relies on: i) the use of local materials and resources; ii) the development of technologies related to the local building tradition, where the technological rate must be consistent with and can be supported and reproduced by the culture and society representing the target of the cooperation project; iii) the participation of local beneficiaries into the process. Despite the figure of the architect denies one of the fundamental conditions of vernacular architecture: “the architecture of the people, and by the people, but not for the people” [3], this approach leads to the development of principles of the vernacular architecture, and tends to establish a direct comparison and a constant collaboration between the professional designer and the recipients, based on the principles of local building culture. Technologies developed in this context by relying on local resources, allow to invest a main part of the financial resources of the cooperation project in the territory and in the development of the local community, but they are also the result of time invested in partnership.

Although not excluding to start from the context analysis and its needs, a design approach based on prefabrication focuses on industrial materials prefabricated elsewhere and transported to the project site, on a fast and easy assembly, on modularity and the serial nature of the elements production and of assembly operations. Serial production allows to reduce manufacturing costs through industrial processes, while increasing those of materials transport; the speed of assembly allows to reduce the time of construction by lowering labor costs and that of the staff in field mission, but limits also significantly investment in the area and participation of local people in the process. In the absence of local producers of the resources used and without an external intervention, the use of materials not locally available makes

difficult to replicate used technologies locally, so that this approach seems to be more suitable to an emergency context than to development processes in marginal contexts.

Based on a strong credo that an approach to design linked to the development of vernacular technologies through the use of local resources may be the right way to ensure sustainability, both in economic and cultural terms [2], the association Archintorno has worked to the implementation of cooperation projects with rural indigenous communities of the Mexican State of Oaxaca from 2005. Indigenous communities of Oaxaca are deeply surrounded by nature and often marginalized due to difficult access for the mountain nature. Due to this isolation from urban contexts, they maintained a traditional socio-political organization of the community, and mainly saved traditional forms of life-style and of settlement. [4]

Despite these indigenous roots still being very strong, the community suffered a deep and quick transformation over the years. Communities are excluded from production processes of urban areas, country policies, and from the processes of society renewal and the processes of cultural and socio-economic contamination, associated to the migration phenomena directed towards the main cities of the same Country and to the United States, are now evident. [5]

These processes supported the diffusion of new lifestyles and aspirations of “modernity” among the people, that are now also evident from the building environment; industrial prefabricated materials and related construction techniques gradually complimented local natural materials and vernacular forms of settlement as an emancipation signs in most of the wealthy families (fig 1).

Archintorno’s projects focus on a didactic model called Design – Build Studio where students are responsible for implementing architectural projects from design to construction, [6], by recovering principles of local vernacular architectural tradition, that is revisited through a contemporary approach appropriate to the climate, and by using available resources [7], so that the local community exerts a central role in the whole process. With the support of the local non-governmental organization (NGO) CAMPO a.c., we developed three projects in Mexico, through processes strongly linked to the local vernacular tradition: a community center in Santacruz Tepetotutla in 2006 [4] (fig. 2), a community center San Pedro Tlatepusco in 2010 (fig. 3), and Micro-Regional Centre of Technological Innovation in the Liberal Pensamiento 2012 [7] (fig. 4). This allowed us to analyze different aspects of architectural design related to this type of approach and their implications on the whole cooperation project, and at the same time left questions open about the forms of participation, the socio-economic impacts on the community and the transposal of technologies proposed in a territorial development perspective.

A DESIGN BUILD STUDIO METHODOLOGY

Although based on Design-Build Studio model, the methodology developed by the Archintorno, was gradually enhanced by including additional phases and revised according to the considerations produced by the direct experiences themselves. This methodology consists of five main activities:

- a preliminary, on-field investigation;
- design workshops;
- construction workshops;
- a household survey aimed at understanding local lifestyles and housing cultures;
- exhibitions, publications and video-documentary about the project.

Particularly in the second step, Faculties of Architecture and Engineering providing the participating students have been involved in the development of the didactic process through the years: the TU of Berlin, who’s “Mexiko Projekt” was our inspiring model and the Faculty of Architecture of “Federico II” University of Naples in 2006 and 2010, the CRD-PVS of Polytechnic of Turin and the taller Max Cetto of UNAM of Mexico City in 2012. The whole process relies on inclusive and shared strategies allowing a continuous debate among the actors involved in the same project at different levels. The process starts up with a preliminary survey, aimed at collecting all the useful elements for the development of the project and at promoting a very primary exchange of expectations, ideas and arrangements with the community. Since our work mainly focuses on community building, all the inhabitants of the village, or at least part of them, are involved in the project.

The following visit to the village allows us to introduce Archintorno to the local community and to establish cooperative agreements among the actors involved in the project, thus each partner may be able to give its contribution according to its own skills and resources, and to share and define the architectural program with the community too. Beside this aspect, the survey focuses on local materials and resources, construction technologies, building types, habitat and lifestyle, geographic, climatic and socio-economic information in the village.

During the design workshop, students start their work analyzing the data collected: they study all aspects of vernacular architecture, and examine issues detected in construction techniques in order to find adequate technological solutions. Students work on several project proposals and submit them to the community that chooses the most appropriate one. The chosen project is discussed in assembly with the community and it can be integrated with its suggestions and proposals. Once architectural design is revisited, workshop focuses on structural details of the project

and on quantifying construction materials and costs. Once executive planning is completed, we are ready to begin construction.



Fig. 1 - Vernacular and industrial materials.



Fig. 2 - The Community Center in Santacruz.



Fig. 3 - The Community Center in S. Pedro in Pensamiento Liberal settlement.

The Community hosts students for the period of works (2-3 months). We share work and everyday life in that months and it is an important experience that allow us to empower our relation with the communities [4].

On building site, we contract a local mason and carpenter with the didactic role to guide the students in all construction process. They have the key role to share their knowledge on local vernacular construction techniques with students, and at the same time they have the opportunity to get closer to the new techniques proposed in design. The result is a learning by doing process where every labors, students and inhabitants can share their work experience, learning by the others at the same time.

For our last project in Pensamiento Liberal Mexicano, we decided to complement the preliminary investigation with a household survey, to deeply understand the habitat transformation dynamics. A semi-structured interview with the households was made to better determine the people lifestyle and the relation with the use of spaces in the house. The choice of the research themes reflects the holistic hypothesis, according to which all the different aspects of the life of the individuals influence the architecture of the housing compound and of the territory [3], [7].

Students interview the local inhabitants with a set of pre-defined questions, open questions and make a graphic and photographic documentation of the housing compound. These activities allow us an intimate contact with people, and constitutes an important data base to document their culture and for following projects of the association in that area. As the very last step, together with the students, we provide a set of documentation tools (videos, publishing, exhibitions) to promote the whole experience. These tools are also a further chance to think back to all the projects activities, to detect the weak aspects of the common work and to reflect upon possible improvements.

VERNACULAR DESIGN APPROACH ASPECTS IN ARCHINTORNO EXPERIENCE

Habitat, and life style analysis

Human beings is the product of a cultural process that took place over the time and in different places; communities (from the small village to the great countries) through its institutions, are guarantors of this historical continuity that allows to preserve a system of values and a collective identity; this give rise to habits, lifestyles, and generally all human activities leading to social structures and its relationship with the physical environment. For this reason intervening in marginalized communities to lay the foundations for new forms of self-development, is an extremely delicate operation that may often create deep fractures in the social cohesion of the community. This task requires a holistic approach in the cooperation project which provides continuity with the economic and social processes of the place. Our local partner, the NGO CAMPO that works for over 30 years for the self-determination of indigenous communities in the region of Oaxaca is our primary guarantor of this. However, the role of Archintorno cannot be solved in the simple execution of a request of the community filtered through the work of the NGO involved. At each step of the process, from the preparation of the project until the implementation stage there is the attempt to understand the socio-cultural implications of each action. The vernacular approach, compared to the prefabricated one, allows to have the flexibility to adapt to the contributions that result from an ever deeper knowledge of the place and its dynamics, throughout the process.

Since the beginning, during the investigation, our approach is based on two basic assumptions: the communion of intent with the community and the knowledge of the socio-cultural and climatic dynamics of the place. Both elements play a fundamental role in the design of the building, helping to define the factors to guide students in the project proposals and the executive planning. Agreements made with the community through the confrontation with local institutions has in fact the dual aim of engaging, through a choice collectively shared, the entire community in the process, and, at the same time, understanding the real resources available to the community to ponder design choices

and technology solutions. In these terms, for example, in San Pedro Tlatépusco, wood was not only a local resource to be used but also the impervious way to reach the chapensis pine cutting area, the local people strain of loading wood on their shoulders to carry them downstream and finally the work to convert it in construction elements with a rudimentary equipment. Accordingly, the technological choices must achieve a balance between the pieces size and quantity to be used, always trying to understand and imagine how each action will be put into practice in that context. Knowing the context, thus, becomes an important factor to start the design process.

The investigation is based on two related factors: observation and listening; observation of the physical and architectural characteristics of environment and the understanding of the social and cultural dynamics of the community through people's tales: in a design logic strongly linked to the territory, to detect the various technological changes in local architectures without knowing the related manufacturing processes and their implications in the economy of the community, is not enough.

In the same way to measure the composition and shape of the spaces without understanding the different socio-economic and environmental factors involved (fig. 5) is not enough. For example, the dislocation of different function of the house in the open-airod compound detected by the observation of the place, in the case of the project in Santa Cruz, led naively to the idea of connecting the two floors trough an external path.

Following a specific request of the community we modified the project adding an internal staircase offering the users a covered connection to the second floor. In that case greater attention was paid to socio-economic factors of the observed articulation of spaces, partially underestimating climatic aspects. Participation of community, made possible to find appropriate design and technological solution that could satisfy both aspects.

Technical and knowledge interchange through the participation process

One of the principles on which all three projects were developed lies in the aim of creating a common path between the actors involved in each stage of the process. So the value of the construction phase does not reside only in the construction of a physical space, but also in the creation of a exchanging processes which foster this dialogue through the networking of experiences and skills: the construction phase has an educational value not only for the participating students, but also for the community members involved. The whole process is the result of expertise exchange among architects, local workers and students during the period of construction, through the involvement of some members of the community as actors of the construction process; this interaction is significantly facilitated by the use of local resources and the development of techniques arising from the local culture, previously studied. This allows us to confront each other on the basis of a common vocabulary that establishes a form of communication among the actors involved. So the heritage of this operation becomes, a linguistic enrichment that can produce new forms of local architectural expression, new skills and the awareness of their resources' potential.

An example that clarifies this approach is related to the process by which the wooden structure (present in all three projects) was designed, considering the related implications in the later step of the construction. Starting confronting with the community, we defined the basic size of wooden pieces to compose the whole structure, according to the material local production processes; these elements are then assembled in the final design in order to enhance both structural and environmental performances, considering at the same time, construction processes that local workforce could manage.



Fig. 4 - Micro-Regional Innovation Center in compound in Pensamiento.



Fig. 5 - Investigation sketch of a Santacruz Tepetotutla project.

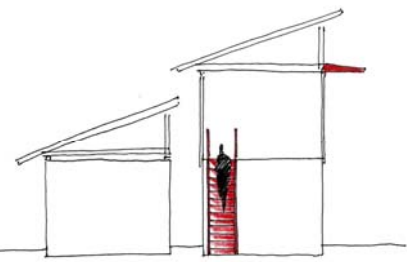


Fig. 6 - Sketches of implementation made in Pensamiento Liberal Mexicano.

In this way, during the construction step there is the concrete possibility to perform a knowledge exchange: the local labor force, able to interact immediately in the building process, can pass down to the students their technical knowledge about the manufacturing of elements and the basic assembly operations; at the same time it is easy to introduce and discuss with them new technological solutions, leading to an enrichment of local know-how. A community resource, in primitive forms becomes the easiest vehicle of communication.

This form of collaboration also takes place through the community involvement in design choices: in fact the development of the project proposal always goes through a comparison with the community that in many cases led to substantial changes in the project. It is the case of the addition of the aforementioned internal staircase as well as the implementation of the roof overhang in order to better protect the rear façade in the project for SantaCruz (fig. 6), or the

spatial changes which took place in the project for Pensamiento Liberal. In this second case, after a meeting with representatives of the cooperative, the need to protect one side of the building particularly exposed to rain and wind, led to the displacement of the external staircase and the redefinition of the interior spaces and of the access paths of the original proposal.

This process of mutual exchange, is particularly useful also in the construction phase in order to design a dynamic process able of dealing with unexpected accidents that we often encountered in marginalized contexts such as those of the villages: many detailed solutions are in fact the result of economic technological and logistics constraints often overcome thanks to the local actor knowledge or arising out of the interpretation of habits and local techniques experienced in everyday life (fig. 7). That is why we could recover archaic technologies deemed by the locals, initially not taken into account; developed within a different technological system, they can be part of the collective knowledge asset again.

Technological Improvement: construction costs, modularity, reproducibility, maintainability

The design approach followed by Archintorno, which starts from the reinterpretation of vernacular techniques through the use of local materials and resources, allows to work on technologies reproducible by local people, trying to get good performance of climatic comfort, reducing at the same time construction costs particularly related to the transport of materials and energy costs related to construction. This kind of approach also aims to the not negligible goal, to develop compatible low-cost technologies and in continuity with the tradition and expertise of local people, so as to tend to a self-development model, enabling the community the complete process management, maintainability and repeatability of the technologies used, once exhausted our presence on site, and allows us to invest large part of the project resources within the community.

In our experience, it was not always possible to carry out such a linear process, often the circumstances have led to trade-offs in an effort to better use the available resources in a climate of full participation with the community. The trend of rural communities to prefer the use of industrial materials, often seen as synonymous of advanced technology and progress, also has in some cases affected our choices. For the project of the Community Center in Santacruz Tepetotutla for example, the village asked for a an entirely concrete structure, also to take advantage of the foundation and vertical structures already carried out in the previous years and of the materials already purchased, despite the aim of the association was an architecture in full harmony with the local environment, making the most of local materials. We came to a compromise and obtained the upper floor to be made entirely of wood, taking advantage of local knowledge in manufacturing the material, so we proposed a wood structure revisiting local vernacular constructive principles, but offering greater rigidity and a better control of heat transmission from the roof.

Construction costs – Still in Santacruz, wood of community property, was made available to the project for free, and the expedient was repeated in the other two projects, the attempt to promote the use of such an important local resource, has enabled us also to invest in the local labor to cut wood and technological solutions for the improvement of thermal comfort of the building. Despite this, the rather consistent use of industrial materials affected the costs related to the transport of materials, although coming from the nearby city of Oaxaca, resulting in a significant portion of the total budget of the project. In our last experience in Pensamiento Liberal, instead, it was possible to use almost entirely local materials such as wood, stone, earth, reducing the use of cement and other industrial materials to the minimum. Materials used for construction, were extracted directly from the village territory, minimizing transport distances, and then transferred in the yard area using community property means, greatly reducing costs and also allowing us to distribute most of the funds inside the community itself.

Modularity - In this approach, modularity recognizable both in the individual designed building elements size, as in the size of the structures, meets the need to make the most of available resources. So the wooden structures are always designed with elements according with the cuts to be performed and transportable by the community and with the resources available on site, the size and frequency of the structures are designed according to the size of the available elements that will be used to complete it, as triplay, wood boards, etc. (fig. 8, fig. 9). The load-bearing earth wall structure size of Micro-Regional Centre of Technological Innovation of Pensamiento Liberal was modulated on those of the formwork provided by the supporting local NGO. So the project becomes a non-stop adaptation process, in which choices are revised several times until all resources are used to the best.

Reproducibility - Although the reproducibility of proposed technologies is one of the strengths of the vernacular approach to design in developing contexts, it could be a not so trivial target to be achieved; the involvement of local residents and craftsmen in the construction process, the use of local materials and technologies developed on vernacular architecture principles, is enough to determine the reproducibility of the building? Actually construction methods and processes, as the economic component play a key role in this case. For the earthen load-bearing walls in the Pensamiento Liberal project we choose to use the technique of mechanized Pisé (fig. 10) , using a compressor and pneumatic pistons (fig. 11) to speed up compaction and taking advantage of the abundant workforce of students for the preparation of earth. But as far as the large number of students employed in the construction can be replaced by the villagers themselves, the use of mechanical means, out of the reach of communities and the impact of fuel costs for their functioning, make the process quite hard to replicate. The structures of the wooden roof, proposed in all the three projects, as far as offering innovative technological solutions than those normally used in the local context, employ a quantity of timber that remain sustainable in cooperation project context with the whole community, but that it becomes

economically hardly accessible for individual locals who want to propose them for their homes.

Maintainability - Despite the many questions raised on the actual reproducibility of the process, the attention paid in the design phase to the use of local materials associated with the sporadic use of elements prefabricated in the surroundings, as well as the involvement of local labor in the construction process, offers the community the ability to manage the maintenance of the property, ensuring its survival over time.

Time of construction: social impact and resources management

Obviously this kind of design approach requires to spend a relatively long time on field in the construction phase, comparing it with a design approach relying on prefabrication. This is partly because of its educational nature, in part because the production chain of the materials used for construction is fully dealt with in place, in part, for the long and difficult management processes of local resources by the authorities of the community and its marginality degree. Before they are put in place, materials are extracted, cut on the territory belonging to the village and then manufactured on the building site through processes often not mechanized, by students and local inhabitants who develop a relationship apprentice - teacher in both phases. This process not only creates a natural daily slowdown in site work, but can cause not negligible unexpected situations. In San Pedro Tlatepusco, because of the particular marginality of the village, the wood needed for the construction was cut at high altitude, left to dry there and gradually brought to the site by the locals on their shoulders, through paths made impervious by the weather. This situation has strongly influenced the development of the construction site and more than once we risked to have to stop it, due to lack of material. A long execution time, can have a significant impact on the territory and a high cost of management for the host community mainly because of the persistence of a large group of students on site. But at the same time allow a stimulant meeting of cultures, as previously described. During the 2-3 months of construction, the community is sometimes forced to change in part at their own daily life and work pace and is called to a considerable financial effort to provide for the maintenance of the guests. The choice of the ways in which these processes shall take place affect as much on the quality of integration between students and local residents, as the possibility for the community to continue to carry out part of their daily activities during the period of construction.

In San Pedro Tlatepusco, families turned hosting small groups of students for daily meals, so as not to impact too much on their family life rhythm; this solution however allows less control on the quality of food and wasn't replicated in the other two projects, also for communities choice. In Pensamiento Liberal, the women of the cooperative have turned in a single common kitchen providing meals to all students for the entire duration of the project, spending almost their entire day in this task. The attention with which these issues are examined at the moment to arrange with the community, as well as the manner and timing of the management of local resources through the authorities of the village are crucial for the success of the project.



Fig. 7 - Detailed solution of windows in Santacruz Tepetotutla project.



Fig. 8 - The modular wooden structure in Pensamiento.



Fig. 9 - Wooden roof structure module based on Tejamanil dimension.



Fig. 10 - Mechanized process of compaction of rammed earth walls in Pensamiento Liberal.



Fig. 11 - Compaction with pneumatic piston.

It's a complex but necessary task of cooperation, discussed at the moment to make arrangements with the community, which helps address the design foreseeing times and tools for implementation of the different phases of construction. In the case of Pensamiento Liberal, the cooperative had several difficulties in obtaining permits for cutting wood needed for the project by the competent Community authorities, so that the wood hadn't time enough to dry out completely and his manufacturing was very difficult. This generated a delay that led us to ask the community one more week to finish the work; the proposal was accepted with great difficulty since sowing time was approaching and the locals needed to work the field to obtain food for the following months.

CONCLUSIONS

In most indigenous villages of Mexico, vernacular settlement patterns and architectures evolved over centuries and still represent the majority of the built environment. Nevertheless they are disappearing fast, since housing typologies inspired by Western models and industrial materials started to be introduced within the communities. This phenomenon happens not only because of the spontaneous action of the socio-economic "elites", that even in these small communities do exist (generally local traders), for whom concrete prefabricated houses are more "modern", "safe" and represent their aspiration to an "urban" lifestyle. The adoption of "industrial" pre-packaged housing typologies is also often promoted by the Mexican government and international NGOs operating in these villages, without taking care of the relation of the proposed constructions to the characteristics of the place and of the community that lives it, with the result of producing a growing homologation of the living environments. Therefore, it is possible to observe a growing trend of substitution of vernacular settlement patterns with "modern" and "industrial" housing typologies, inspired by Western cultural models, with the risk of providing settlement solutions that are inadequate to local contexts and to loose vernacular traditions, which are a precious world heritage of urban diversity, material cultures and skills.

The above presented analysis of the Design-Build Studios carried on by Archintorno, in collaboration with Italian and Mexican universities and local NGOs, in three indigenous villages of the Mexican state of Oaxaca, allows us to propose some conclusions in relation to appropriate approach to be adopted when dealing with architectural design and construction within development cooperation programs.

In spite of the previously analyzed weaknesses of the proposed approach, the valorization of the vernacular housing and building traditions represents for us, as international architects invited by local communities to contribute to give shape to their built environment, the best way to interact with local material cultures and to avoid the risk of proposing housing models originally developed for Western, industrialized countries and passively inferred to southern, tropical, rural contexts.

It is not excluded that a design approach based on prefabricated materials, in these contexts, can pay attention to local indigenous dwelling types and patterns and in some cases, not only in other regions of the southern hemisphere, this kind of technology has been shown to meet local thermal comfort needs. But the use of prefabricated materials produced in Western countries, through these technologies, generates costs, including environmental, associated with the transport of materials unsustainable both globally and for the communities. Furthermore, technologies used are impossible to reproduce and maintain over time for the communities themselves.

On the contrary, vernacular settlements are regional and cultural. Furthermore, the widespread use of local, natural building materials (earth, wood, straw, stones etc.) and building technologies is affordable even by local subsistence economies and enhances cultural heritage and traditional abilities of local manpower. Moreover natural material demonstrated to be very appropriate from an environmental point of view and in relation to their "lifecycle assessment", but also in relation to their performances in terms of climate control and to the provision of indoor comfort in tropical countries.

Enhancing vernacular tradition offers the opportunity to experiment with housing typologies, building technologies and construction processes that are more appropriate to local housing culture and endogenous resources. But also in the forms of design inspired by vernacular architecture, the use of prefabricated materials, even if reduced, today it is often rather widespread. So what's the line? it is possible to think in a hybrid approach that, while starting from the vernacular architecture principles, paying attention to local housing needs and climatic conditions, and making extensive use of local natural materials, can also take advantage of prefabricated elements, on condition that they are produced or producible in the region? May be possible in this way, to ensure reproducibility, maintainability of the building and, at the same time, create the basis for a real participation of the community in the productive processes and development of the society, without recourse to materials, technologies and models designed and coming from the so-called first world countries?

The suggestion that comes out from our experience is to find inspiration in the vernacular tradition in order to avoid the indiscriminate proposition of Western housing and construction models. The proposed strategy is to reinterpret the vernacular tradition by culturally appropriate means, focusing on the introduction of culturally and economically compatible changes. This strategy can only be possible if it is based on the full involvement of the local communities at each step of the decision-making process.

ACKNOWLEDGMENT

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NOMENCLATURE

NGO	Non-Governmental Organization
CAMPO a.c.	Centro de Apoyo al Movimiento Popular Oaxaqueño, asociación civil
TU Berlin	Technische Universität Berlin
UNAM	Universidad Nacional Autónoma de México
CRD-PVS	Centro di Ricerca e Documentazione Paesi in Via di Sviluppo

REFERENCES

- [1] B. Rudofsky, *Architecture without architects: A Short Introduction to Non-Pedigreed Architecture*, University of New Mexico Press, PP 58, 1964.
- [2] P. Oliver, *Encyclopedia of Vernacular Architecture of the World*, Cambridge University Press, 1997.
- [3] P. Oliver, *Dwellings, The Vernacular House World Wide*, Phaidon Press, London, 2003.
- [4] Associazione Archintorno (curated by), *Costruire con la Gente, una Casa Comunitaria nel villaggio indigeno di Santa Cruz Tepetotutla, Oaxaca, Messico*, CLEAN, Napoli, PP 65-66, 2007.
- [5] R. Nicchia and C. Casas Cruz, A. Buenrostro Valadez, A. Herrera Betancourt, *Pensamiento entre aquí y allá. Encuesta sobre el agregado familiar para comprender estilos de vida y culturas del habitar en la comunidad de Pensamiento Liberal Mexicano, Oaxaca, Mexico*, Thesis, Universidad Nacional Autónoma de México, Mexico City, PP 9-15, 2012.
- [6] A. Oppenheimer Dean and T. Hursley, *Rural Studio. Samuel Mockbee and an Architecture of Decency*, Princeton Architectural Press, 2002.
- [7] R. Pennacchio and R. Nicchia, *Promoting vernacular architecture as a central topic in academic research and education in Mexico*, *Proc. International Conference on Vernacular Heritage and Earthen Architecture CIAV2013 / 7th ATP / VerSus*, CRC/Balkema/ Taylor & Francis, 2013.