Towards concerted planning: mapping with locals and GIS as added value

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Abstract

The article focuses on participatory mapping and the integration of this method and social process with Geographic Information Systems. The reflection addresses the complexity, diversity and narrative of places voiced and depicted by local inhabitants on maps or models, and the need of encoding and optimizing data and information so generated thereby the use of digital tools. The aim is to put local, scientific and technical expertise into dialogue within a process of knowledge co-production and concerted decision-making for more effective territorial planning and natural resource management.

Keywords

Community mapping; participatory planning; participatory GIS; community development; natural resource management.

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Introduction

Mapping with ordinary people is a quite diffused practice worldwide. Commonly known as community mapping (Chambers 1994, 2006; IFAD 2009; Emmel 2008; Di Gessa 2008; IIED 2006; Water Aid 2005), it entails the direct involvement of inhabitants in the depiction of the place where they live on maps or models, according to their daily experience, local knowledge and sense of belonging. Community members have a central role; facilitators normally support the process; and, under the best possible conditions, specialists, government officials and NGOs operators are involved.

Analysing different context's features and problematic issues, participants consider existing resources and potentials to find opportunities for improvement and transformation. The practice voices an internal point of view related to places that is normally unheard. It reveals the intangible, the narrative embedded in space production through a collective social process, while it allows identifying and putting in interaction different interests and forces in play. As a way of revealing formal or informal organizational patterns and systems of power in territorial management, as well as uncovering place-rooted traditions and socio-cultural geographies, the process of co-mapping has demonstrated its capacity within urban and rural planning. However, despite its efficacy at different social and institutional levels, it presents certain limits. This research work arises from the acknowledgment of value of this practice and consequent need to deal with the related constraints in order to improve its effectiveness. The reflection started from the enormous quantity of data and information generated during mapping processes, not only as local people is in the condition to express their know-how, but also as a consequence of the unique opportunity of dialogue among scientific, technical,

and traditional expertise. This contributes to co-producing 'new knowledge' and alternative visions on territories. The question is how to prevent this precious information from being lost; how to capture the process, to rationalize data in a way these can be reliable, comprehensible and particularly re-usable within planning circles for decision-making? Very often, in fact, co-mapping practice turns out extremely powerful in terms of social process, such as for community building, behavioural change, sensitization of stakeholders and conflicts resolution.

However, maps and models, which embody both the tactile mean of interaction and the actual outcome of the mapping process, are not used in their whole potential. One reason is that the hand-drawn maps or the manufactured models that offer a major knowledge on which to base interventions in short and long terms, are generally not 'autonomous products'. They need the oral description by map-makers in order to be explained and understood in their full significance. Lines, dots, polygons, drawings on maps are signs that represent physical elements containing a strong semiotic. Each of them tells a story of social dynamics, people relations and even asymmetries of power. This is the real contribution to planning and design, which only a meaningful participatory process can produce. Therefore, to make the most of this precious information; to avoid ever starting over again while guaranteeing continuity of inclusive processes; to make local people being real agents of development and their involvement relevant, it is important to have solid, communicative, authoritative and re-usable outcomes. This is why it might be useful to transfer people maps and models signs, together with the knowledge they contain, within a geographical framework widely understandable, universally recognized and easily accessible. Geographical Information Systems can play a key role in this sense. Despite some scholars' opinion who defines GIS as a

'cold' and unfriendly instrument, this versatile technological tool actually presents interesting potentials not only in digitizing information, encoding spatial and social data and visualizing relations, but also as a tool of complex analysis and support for action, which can add great value to the community mapping process.

Capacity of maps and origins of participatory mapping

Resulting from an articulated interplay between reality and its depiction, spaces and maps co-produce each other through social construction, transformation and use (Del Casino, Hanna 2011). "Conceiving of maps in this way tells that they are never fully formed, but emerge in process and are always mutable" (Doodge, et al., 2011 p.6). This moves away from notions of accuracy, design and aesthetic to emphasising the complex contingent inter-action among people maps and the world they represent (Ibid). Being essentially spatial and socially constructed, maps are inherently political, a concept which resonates with Harley (1989) consideration of maps as a form of power knowledge. Wood (2010) in his book Rethinking the Power of Maps, made an interesting metaphor: "map is an engine where an engine is a machine that converts energy into work (…) maps convert energy to work by linking things in space" (p.1). So that, considering energy that through an engine becomes work, maps 'do work', 'social energy' through a map becomes 'social space' and equivalently social energy through a map becomes 'knowledge' (Ibid). In this sense, participatory mapping can be understood as a "means to re-problematize the process of knowledge production with respect to its visual representation and spatial understanding and to expand the room of manoeuvre of those typically disenfranchised from such process" (Allen et al., 2015,

p.261).
Spatiality's conception moved from physical objects and forms towards the variety of territorial, social and political processes and their interrelationships embedded in space (Corner, 2011). "Mapping is key as it entails searching, finding and unfolding complex and latent forces in the existing milieu" and at the same time "discloses, stages and even adds potential for later acts and events to unfold" (Ibid., p.227). While common development plans decide from on high lead to an end, map-making is a "generative means, a suggestive vehicle that 'points' but does not overly determine" (Ibid., p.227). In this sense, mapping is not only a way to capture place-making local practice but is itself a means to produce new spaces and possibilities.
Over the last decades diverse mapping practices developed out of participatory approach to community development particularly for the involvement of the less privileged groups of society.
Specifically, Participatory mapping originated within the family of approaches comprising Rapid Rural Appraisal (RRA), Participatory Rural Appraisal (PRA) and Participatory Learning and Action (PLA). All these methods took place within development practice between the 80s and the 90s. Mostly adopted by practitioners working in rural areas of developing countries, the approaches allowed mutual learning and inclusive assessment processes to be extended into planning and collective action (Chambers 1994). Within Rapid Rural Appraisal (RRA) sketch mapping was used as method of analysis, however maps were still made by process facilitators who often were criticized by the natives themselves for their maps' serious inaccuracies and omissions (Chambers 2006).
It was with the diffusion of PRA that professionals stepped back and realized local people have the ability to make their own maps by themselves. The definition of "expert" was

questioned, together with the kind of relationship established between community people and specialists (Ibid).
PLA term was suggested by Chambers in 1995 to rename PRA when participatory approaches were not limited to rural areas and when there was the need to point out that research is for action and not only for appraisal.
Nowadays, participatory mapping approach is adopted worldwide within different fields, such as natural resource management, land use, tenure and rights claims; negotiation of boundaries and conflicts resolution. Besides, it is used for sanitation improvement; water, agriculture and pastoralism administration; mobility, education, crime; and, more recently, in relation to planning.

Debate about GIS and participation

Despite the variable levels of success of different forms and modes of GIS democratization worldwide, the pitfalls and constraints this practice encounters are many and the attempt to put "GIS into a technology with a social conscience" is quite controversial continuously navigating among criticism, optimism and frustration (Dunn, 2007, p.617). There is, in fact, a creative tension between social theory and GIS community. One concern is that, being GIS historically and widely used in top-down spatial decision-making, its use in participatory processes could result in forms of co-optation and therefore it could contribute to perpetuate hierarchical and established patterns. Another important question among scholars is whether GIS can be truly "participatory". How the deepness of local knowledge, the amount of qualitative data (culturally and socially meaningful), not always with spatial reference, not always precise, not always scaled, can be integrated into a GIS? How

can the richness of people involvement be represented within such an exigent tool that is not designed to automatically deal with uncertainties or fuzziness? McCall (2006) is convictive: "precision cannot always be considered a necessity in Participatory GIS, exactly because spatial reality is not precise: it is always fuzzy and frequently ambiguous, even discursive and emotional, although the degree certitude varies with the purpose of the PGIS" (p.119). This is why innovative GIS and visualisation tools are coming into play handling 'imperfect data' capabilities. "GIS is eventually developing the potentials to elicit and create displays of spatial knowledge and rich pictures of a multi-textured world" (Ibid, p.15). To this purpose, McCall mentions some of the possible modalities to make multifaceted visualizations of data. Some examples are: layering issues and time; inserting fuzzy symbols; adding multi-media hypertexts or interactive hyperlinks; shading or blurring boundaries, showing flows and dynamicity (Ibid). In a way this is integrating with digital graphics components.

The attempts to render GIS more "social sensitive" come from professionals who are basing their intent on the "recognition that both quantitative and qualitative methods and information can exist in the same organizational system" and that "there is a room for a grounded contextualized and reflexive GIS" (Dunn 2007, p.630). In other words, it means pursuing a less rigid geometry of the software and more opportunities for inclusiveness and representation of complexity and disagreement (Ibid).

Processes of people map-making and application of PGIS methods, also include questions of access, control and ownership of information, data and outputs. These issues are quite "sensitive" as when PGIS is adopted, the process can 'turn tacit knowledge into a public one' (Abbot et al., 1998, p.29). This means that knowledge moves out of local control and this could increase undesirable visibility igniting latent

(or creating new) conflicts (Fox et al., 2006). Depending on the context and local dynamics, this could augment pressure from outside on local communities (Abbot et al., 1998). On the other hand, 'being on the maps' is definitely crucial for people living on the margins, and/or in vulnerable conditions. Becoming 'visible' means get recognition, have voice and augment bargaining power in negotiation. This is why it is extremely important that information and data generated through mapping are available to local spatial knowledge holders and, most of all, selectively opened to the outside world (Ibid.). People should be always set free to decide about placing or not, protecting or disclosing their spatial data, particularly cultural sensitive issues or at risk of manipulation (Rambaldi et al., 2006). In general, tools involved in participatory processes need to be ethically and consciously adopted both by professional and by community members themselves (Fox et al., 2006). Practitioners facilitating have the responsibility to explore, together with community members, purposes and objectives of the mapping activities, strengths and possible drawbacks, attentively analysing the dynamic system of 'formal and informal institutions' operating in each specific context (Leach et al., 1999).

Scale mapping in Vietnam and Philippines

This research work was grounded through several field experiences in different countries. The first, in 2013, within Asian Coalition for Community Action (ACCA), a program of the Asian Coalition for Housing Rights (ACHR) and the Community Architects Network (CAN), people from Hung Hoa Commune, a peri-urban area of Vinh City in central Vietnam, were involved in a six-months scale mapping

process. The rural area, affected by significant flood once a year that destroyed one of the two crops potentially available, presented inadequate water drainage system unable to support the load of heavy rain during the monsoon time. While the government allowed the work with communities in Hung Hoa to get opinions about the area's redevelopment plan already approved, community members wanted to focus on the design of the drainage system upgrading, despite there were no engineers among the mapping facilitators. The mapping sessions revealed the technical expertise of farmers embedded in their everyday working life, highlighting their struggles when trying to manage the flood damage over both the rice fields and their houses. They analysed the flood and its impacts throughout the area identifying land elevations and representing water directions. They plotted water pumps, main channels, and small ducts outlining a detailed design of the entire system of drainage. They also mapped their diverse resources, such as natural features, places of worship, traditional activities. Maps uncovered their social realm and revealed their local know-how. The process stimulated their engagement and increased their self-confidence. When community members proudly presented the local government with their maps, officials were quite surprised by the work done and showed great interest to their say. From that point on, people map-making was replicated several times in other Vinh city's Communes as a method of involvement.

Figure 1 - Left: Phong Dang. Woman presenting the concluded drainage map of the hamlet where she lives. Right: Phong Yen. Discussing while mapping drainage and natural/agricultural resources (Photos credits: Barbara Dovarch)

In Philippines, during the Regional Workshop 2013 of the Community Architects Network, the community of Barangay Bagbaguin of Valenzuela City, Metro Manila, was in the process of collectively acquiring the land on which their settlement was built informally decades before. However, the government requested that they first comply with the city's official standards of safety and density. Some time before, an engineer was hired by the community to map the settlement. During the workshop people realized the engineer's map was not accurate, containing mistakes, lacking of precision, and not respecting the 'architectural diversity' of the settlement. This prompted 352 households to use 2D scale mapping to show real conditions, exigencies and the articulated composition made of irregular housing structures and maze-like alleys. Their work demonstrated that planning is not just a matter of subdivision schemes but

rather a complex process that must adapt to contexts' specificities.

People analysed the possibility of widening roads, respecting safety requirements while minimizing interventions on existing houses. They also evaluated options for creating additional access points to the settlement. The map was of great value when devising alternative solutions and discussing proposals with Valenzuela City's Mayor and municipal officers. Indeed it enabled conditions for constructive dialogue and supported fruitful negotiations between the two sides.

Figure 2 - Community work in Barangay Bagbaguin: discussing with Valenzuela Mayor; measuring; scale drawing; map-making (Photos credits: Barbara Dovarch)

Exploring GIS potentials

The quantity of data generated during the mapping processes in Vietnam and Philippines, captured on the hand-drawn scaled maps produced and through notes, semi-structured interviews, informal conversations, reports on site visits, video and pictures, denoted an amount of knowledge that was well worth exploring. From this conviction, an experimentation was carried out consisting in the digitization of maps produced by local inhabitants in Vietnam using GIS (Dovarch, Tedeschi 2019). It was interesting to realize how the locals integrated the simple cadastral maps, used as a base for mapping and showing only administrative subdivisions, with other contents and information, significantly enriching their representative capacity while transforming their language. The pictures of the maps (as the maps stayed with communities) have been geo-referenced on GIS thereby image rectification, and the information contained have been reorganized in a database through a process of 'encoding spatial narratives'. Through the attentive construction of the geo-data base it was possible to organize proper tables within which to re-write information as spatial attributes which could 'tell the story' behind the simple graphic signs of local people. Consequently it was possible to cross information particularly regarding the interdependency between land elevation, flood, water flow, pollution, level of impact on different hamlets and physical, natural, social resources availability. This allowed the creation of different thematic maps and layers for complex analysis and deeper understanding of issues.

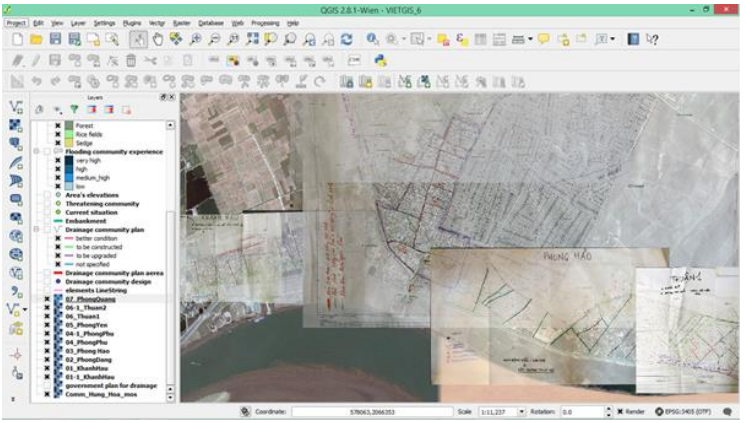

Figure 3 - Overlaying on GIS of Hung Hoa orthophoto and hamlets' maps made by communities

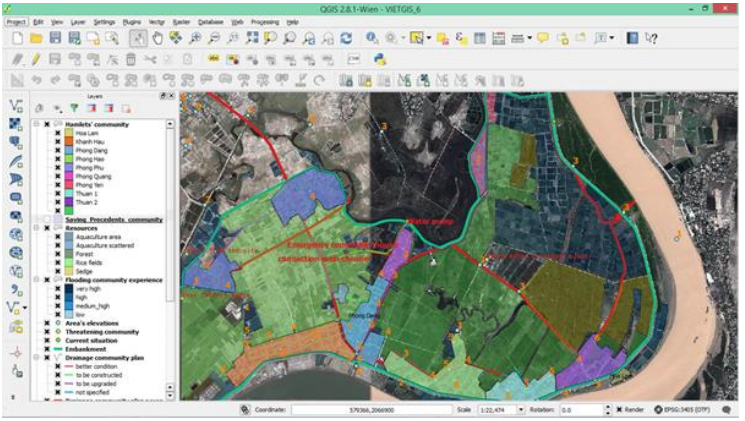

Figure 4 - Digitization of community maps' information on GIS thereby the creation of a geo-database

While within most of PGIS projects and approaches, the use of GIS is central and pre-determined in the methodological plan, in this case it was necessary a reverse process. Data and

information, in fact, were produced on the ground without any intention of using GIS in post-production.
This sometimes created problems of consistency while inserting data on GIS, yet at the same time it gave the chance to 'test' GIS in a completely different way. Data were not priory filtered by logic organizational scheme and collected accordingly; rather they have been gathered in a very spontaneous environment through different traditional participatory methods. GIS tools intervened at a later time, called to contain this information. For several reasons this experiment missed the opportunity to involve communities in the post-digitization phase. The subsequent step would have been to show people the maps on GIS, check together the reliability of the digital representation and allow them to become owners and possibly users of the 'new' digital and derived maps. Also this elaboration would have been useful to local authorities and planning specialists when deciding and currying out intervention in the area. Certainly, the experiment was a good opportunity to prove the flexibility of the software that definitely demonstrated its capacity to welcome local know-how and deeply enrich the process of knowledge co-production.

Participatory 3D Modelling in Samoa and Nauru

In 2016, another field experience of four months in the Pacific, between Samoa and Nauru, was fundamental for this research path. Through the collaboration with the Technical Centre for Agricultural and Rural Cooperation (CTA), based

in the Netherlands, and the Ministry of Natural Resources and Environment (MNRE) of Western Samoa, it was possible to carry out a participatory evaluation of Participatory 3D Modelling (P3DM) practice (Dovarch 2017).

Since 2012, in fact, the participatory construction of physical relief models for supporting natural resource management spread in the country. A total of 19 P3DM processes have been carried out by the local government together with local communities, contributing to climate change adaptation while generating a wide set of remarkable behavioral changes. Through P3DM, locals were able to identify, physically locate and evaluate their territory's vulnerabilities and potentials, as well as understand why and where mitigation measures were required. In particular, they developed an 'eco-system perspective', enabled by the bird-eye view on territory, which allowed a clearer understanding of spatial-temporal and cause-effect interrelations. People realized they play a central role in environmental protection and through their conscious actions could increase quality of life in the long term while reducing the risk of disasters. Elders and youth had the chance to dialogue around the model allowing inter-generational knowledge exchange, mutually learning about the important relation between nature and local culture over time. Communities and government started collaborating using P3D models as a reference for implementing interventions in customary-land (81% of the country territory). These ranged from setting intercrop plantations in collectively managed agro-forestry plots for village consumption, sale and export; putting up

fencing to keep livestock 20 metres away from rivers; building water catchment and water delivery systems; constructing and managing several nurseries for farmers' training and for plants and seeds provision. P3DM practice helped to sensitize people on the benefits of conservation, monitoring of forests and land, paving the way for sustainable socio-environmental development and climate change adaptation. In addition, models are currently used by local schools for educational purposes and as 'orientation device' for tourists. Finally, P3DM practice is indicated within current plans for natural resources management as an essential approach to planning in the country.

Recently, P3DM was also introduced in the tiny island of Nauru (21 sq.km) through a South-South initiative promoted by the Secretariat of the Pacific Regional Environment Programme (SPREP) in partnership with the CTA and facilitated by the technical staff from MNRE of Western Samoa.

The P3DM process in the Republic of Nauru started to support the collaboration between government and community in building social and ecological resilience in the island. Nauru is passing through a process of environmental degradation and it risks of becoming a hostile place. A century of uncontrolled extractive industry affected most of the island's land mass, added to dramatic economic recessions, failed investments and increased vulnerability due to the impact of climate change.

Figure 5 - Inhabitants of Laulii-Falevao village, Western Samoa, populating their 3D model (Photo Credits: Paulo Amerika)

Moreover, other forces at play are influencing land use management as Nauru hosts one of the Australian offshore processing centres for asylum seekers. Migrants wait around 18 months for the definition of their status and often their requests are declined, so they end up staying on the island to start a new life. Even if the social mix is slightly contributing to revitalize the local economy, both the rooted social milieu and the carrying capacity of the small island are intensely impacted.

In May 2016, during one-week workshop the base P3D model of Nauru was greatly constructed by a diverse group of natives. The process of 'representation' while populating the model revealed underlying power relationships in land management and important cultural aspects which nurture

the locals' sense of belonging. P3DM was conceived as a supporting tool for increasing environmental awareness and planning land rehabilitation, conservation and protection of terrestrial and marine ecosystems. The collaboration between residents, government and other stakeholders, in fact, became absolutely urgent to 'save land', allowing the population to continue living in the island.

Lessons learned from field experiences

Participatory mapping spread worldwide demonstrating its advocacy capacity in supporting genuine grassroots involvement. However, among practitioners there is the general consent that practice is more advanced than the theory behind its application and there is the need to develop guidelines.

With this intent, the limits encountered during the personal field experiences can represent a starting point for critical reflections. Primarily, it is important to underline that differently from many PGIS approaches which focus more on the GIS component and overlook the face-to-face path, in this research work the social process of map/model-making by the hand of local people is considered crucial in terms of both shared diagnosis and participatory design for action. At the same time, GIS is as much essential as the vìs-a-vìs process of mapping, however its integration comes in a second stage as a support to capture, reorganize and optimize information produced during the mapping process.

P3DM, which best represents this idea, in most of the cases contributed to building constructive dialogue with political and administrative authorities, sometimes becoming part of management plans (as it happened in Samoa), policies and even countries' constitutions (CTA 2016). However, while the social process of 'models' construction and population' with the locals is generally extremely successful, several constraints have occurred in the digitization phase. The transfer of data on GIS not always happened, and when it happened, generally the GIS functionalities for advanced spatial analysis have not been used in their full potential. In Western Samoa, for example, 4 models up to the 19 manufactured have been digitized in the five-year ICCRIFS-UNDP project (2011-2016). The participatory evaluation personally carried out in 2016 in the country, noticed the digitization work done as a mere 're-drawing' on screen of the P3D models' signs (lines, points, polygons) according to the map legend. In other words, the GIS created contained just a simple 'digital image' of the models produced without any related database construction. This means that the spatial analysis was not possible as the geometrical forms were not described, attributes tables were empty and the signs on the digital maps did not contain any additional information apart from their geo-localization. This kind of digitization work, even if entailed a progress in Samoa P3DM practice, it does not add value, as it could, to people mapping process.

The main constraints that influence the GIS tools use on the ground are related to the contextual framework that enable or disable its operation. Despite the availability of GIS

software as open sources, very often there is lack of technical competences. GIS expertise is not easily available among government officials or mapping facilitators. Therefore, even when GIS files reach government departments, not always there are officials or advisers capable to open, read and interpret the data contained. Furthermore, in general, government or NGOs rely mainly on external donors or intergovernmental organizations for funding mapping projects and on external consultants for training officials or operators on community process facilitation and, in few cases, on GIS use. There is a general insufficiency of investments by local governments in both GIS training and people maps' digitization phase. The funded-project-based approach and the lack of local capacity, makes hard to sustain the mapping system and to support communities in the long term. There are also disabling administrative mechanisms (which are important to execute and monitor decisions reached through mapping processes), and regulatory frameworks that constraint the practice in many ways (including the access to official maps and data to be used as a base for mapping). All these issues definitely limit the possibility of GIS methodologies integration to be applied and carried out in its whole potential.

Possible developments in practice

This research work moves across traditional participatory approaches and innovation technologies exploring the combination of different tools available, in order to improve

mutually the traditional and the innovative. Certainly, the process of 'encoding' complexity of people knowledge using digital forms is a delicate work and it demands sensible and particular care by practitioners.

It would be proper that GIS experts are part of people map-making, to experience the process, to record information, to observe and have visual reference of places and related issues (in the case of Vietnam maps digitization this has been crucial). Being part means building awareness in relation to the issues at stake, dealing with the different formats of information gathered and even being able to transform the digitization phase from a desk work to an integral part of the participatory mapping process itself. Technologies can be brought closer to communities through a conscious learning path. Particularly important is the "checking info" phase that is involving communities to make them aware of the GIS work and give them the chance to have a second say on the digitized data. Without any doubt people can understand a GIS map that originates from their own mapping work and consequently they can be able to interact with the digital tool. GIS also allows the 3D visualization of models digitized and this can make easier the comprehension of the on screen projection. Derived maps can be used by community members as a reference during meeting with politicians, government officials and other stakeholders (considering also that physical models can be difficult to be moved around). In addition, derived maps can be updated easily and serve as a base to build upon for future designing and planning in the same area.

Certainly, using official scaled maps as a base in people mapping processes is definitely convenient as these maps have formal cartographic protocols which turn out useful when digitizing information. Moreover, locals can be also provided with handle GPS and/or satellite images, photo cameras, video cameras, notebooks and measuring tools during the mapping process. In addition transect walks, interviews, focus groups or community-led enumerations and surveys can be carried out simultaneously to liberate people creativity and guarantee spontaneity of information gathering. Sketch mapping can reveal people perceptions, conception and attribution of value on space that are important to be considered in design processes. All these methods efficiently complement the map/model-making work and can be layered into GIS. As we said before, GIS is able to contain all these kinds of data formats such as quantitative and qualitative information. In addition, the face-to-face work at the local level might embrace at some point, and by locals' strategic and conscious choice, the spreading capacity of the Web, which results easily accessible after the digitization work using GIS software.

Regarding the practical constraints, such as the structural limitations of contexts; the lack of technical expertise at different organisational levels; the inadequacy and discontinuity of funding which compromise the continuity of mapping processes, it is here argued that coalitions among different actors involved could be crucial. Real 'action learning platforms' in which different entities, formal and informal institutions, such as NGOs, local authorities, grassroots and community-based groups or movements are

committed in building operative alliances (a good example is the Asian Coalition of Housing Rights working with the urban poor and connecting organizations in 230 cities of 19 Asian countries). Moreover, in the particular case of mapping, local universities or research centres could play a very important role. Training on participatory mapping facilitation and GIS can be organized periodically in collaboration with international institutions and involving not only students and researchers, but also government officials, development practitioners and community members. Universities or research centres can become a point of reference for the entire process taking care of the various phases (mapping facilitation, participatory digitization of data, participatory design/planning); as well as safeguarding the knowledge produced in mapping processes (data protection and archiving). Young students need practical experiences for grounding their learning and they can definitely benefit from the work with communities. Universities in collaboration with civil society can also contribute to sensitize local governments. For example, they can test in the field different mapping approaches and showing results, and providing (with communities' consent) digitized and updated derived maps to be used as a base by officials and consultants involved in planning. NGOs can also benefit from the universities' work to get rationalized data and information when working and supporting local communities. Even intergovernmental organizations could find very useful the production of knowledge and related maps based on local know-how to be considered for implementation of their programs and funds allocation. In

this realm, economic resources can be accessed from universities' funding systems sustaining educational programs and even arise out of alliances' agreements (government contributions, community saving, donors). Mapping and modelling are generally very low cost practices and, by building local capacity, also the digitization phase would become inexpensive.

Finally, networked communities can share knowledge and mapping expertise acquired in peer-to-peer modality while contributing to scale up their actions and voice. Working on the local in fact does not mean to think locally and fall into particularism; inversely, it should increase the local scalar authority, showing inner identities to contest the homogenizing vision from above on territories, so common within planning circles (Allen at al., 2015). Participatory processes cannot rely on time-limited projects, which, once over, undermine the effectiveness of the work done, including the possible loss of the data and information generated. Somewhat, the practice needs to count on a supportive, resourceful and organized action learning system.

Conclusions

In a system of reciprocity knowledge is uncovered, shared and co-produced by all actors in equal positions. The process of mapping has the potential to challenge institutionalized modes of space management putting into communication and dialogue the 'perceived' the 'conceived' and the 'lived'

(Lefebvre, 1974). That means those who 'conceive' places from outside with those who 'perceive, conceive and live' places from inside that normally do not have any influence on interventions (Allen et al. 2015). Places, and people who live in, are abstracted by outsiders' views and sometimes misinterpreted and misrecognized. Most of the time, even though outsiders ignore the reality of issues, they are those taking decisions on space transformation. In this realm mapping practice acquires a fundamental role. The interaction among different agents with different expertise in representing territories contributes in the creation of a unique comprehension of reality which would never be reached without such a collective energy. Inhabitants have the opportunity of questioning and reconfiguring methods and procedures; proposing alternative ways and more contextualized actions. This does not mean that mapping is always the solution or the only way possible and neither that it is always the case of mapping. However, if considered adequate in specific contexts, time and momentum, map/model-making can be an effective means to pursue more just physical and social change. Accordingly, the integration of different methodologies here explored, such as community mapping and GIS, can increase effectiveness and raise value of the participatory processes; making its outputs more authoritative, communicative, and particularly accessible and usable by specialists.

This means bringing local know-how to be relevant in planning processes and considering co-production of knowledge the true engine of transformations. Co-mapping can contribute to revealing diversity and place identity, inner

conflicts and power dynamics, voicing the dialectical social production of space in specific contexts. By enabling citizens to exercise agency and secure their rights, the practice is not only a place making tool, but can become a catalyst of change and a mean of advocacy, paving the way towards more concerted planning and design processes.

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