

Case study

## PHILIPPINES

# Community 3-D mapping as a tool for resolving territory-bound land disputes<sup>1</sup>

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For at least a century, cultural communities and biodiversity in the Philippines have been under great pressure from logging and mining operations, conversion of forests into farmland, population increase, and the movement of lowland communities into areas traditionally occupied by indigenous peoples (IPs). In the 1970s this had ignited long-lasting conflicts between IPs and the central government.

The 1986 revolution that propelled President Corazon Aquino into power provided opportunities for the active participation of otherwise marginalized sectors of society.

IPs, in particular, benefitted from the 1987 Constitution, which recognized their existence and that of their ancestral lands, cultural plurality and autonomy (Wandag, 2001). Community-based initiatives in the Cordillera Administrative Region in Luzon from 1986 to 1992 also created “peace zones,” – or demilitarized areas of dialogue and consensus building – and encouraged the working of indigenous systems.

In 1992, the National Unification Commission (NUC) was created to identify the root causes of conflicts, including Cordillera and Moro Muslim movements, through nationwide consultations. As a result, the Social Reform Agenda and other peace initiatives were launched. The Department of Environment and Natural Resources

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<sup>1</sup> This paper heavily draws from a journal article, “Bringing the Vertical Dimension to the Negotiating Table: Preliminary Assessment of a Conflict Resolution Case in the Philippines,” authored by Rambaldi, G., Bugna, S., Tiangco, A., and De Vera, D. in 2002.



(DENR) issued DENR Administrative Order No. 2 Series 1993 (DAO 2, S. 1993), which sought to recognize, identify, and delineate areas occupied by IPs. The Order provided for the issuance of Certificates of Ancestral Domain Claim (CADCs) to eligible groups. The CADC provides a formal acknowledgment of IPs' rights and serves as a temporary degree of control over the land. CADC applicants had to meet a series of requirements, including providing proof of use and occupation of given portions of the territory, since time immemorial.

In 1996, Cordillera peace partners formulated the Four-Point Cordillera Peace and Development Agenda (Box 1).

A series of follow-up consultations resulted in the identification of critical peace and development issues related to land tenure and land tenure security and ancestral domain recognition.

The year 1997 marked the passage of the Indigenous Peoples Rights Act (IPRA), which laid the foundation for the recognition of indigenous groups' tenurial rights on their ancestral domains.

Between February 1996 and June 1998,<sup>2</sup> DENR issued 23 Certificates of Ancestral Domain Claims (CADCs) to municipalities within the Cordillera Administrative Region.

Prior to the awarding of the certificates, the Office of the Presidential Adviser on the Peace Process (OPAPP) facilitated consultations with local communities to formulate ancestral domain resource management plans with the assistance of local NGOs.

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<sup>2</sup> Memorandum Order No.15 Series 1998, of DENR Sec. Antonio H. Cerilles instructed field offices of DENR to stop processing and issuing CADCs and CALCs.

## Box 1. Cordillera Peace and Development Agenda

<p><b>Ancestral Domain</b></p> <ul style="list-style-type: none"> <li>• Identification, definition, delineation</li> <li>• Resource use and management (land use mapping, Ancestral Domain Resource Management Plan preparation)</li> <li>• Innovative and sustainable development (social equity, ecological integrity)</li> </ul>	<p><b>Cultural Integrity</b></p> <ul style="list-style-type: none"> <li>• Pluralism</li> <li>• Enculturation</li> <li>• Harmony in Diversity</li> </ul>
<p><b>Healing and Reconciliation</b></p> <ul style="list-style-type: none"> <li>• Pluralism</li> <li>• Re-entry, re-integration, accommodation</li> <li>• Addressing the roots of insurgency</li> </ul>	<p><b>Autonomy</b></p> <ul style="list-style-type: none"> <li>• Empowerment of people through consultation consensus and participatory governance</li> <li>• Re-definition of governance</li> </ul>

In 1999, the OPAPP formulated an Integrated Conflict Resolution and Management Programme (ICRMP) for 11 pilot CADC municipalities in partnership with the Cordillera Ancestral Domain Partners for Peace and Development (CADPPD). The Program aims to support local conflict management and resolution processes, and promote the use of indigenous knowledge, systems, and practices.

Specifically, the ICRMP aims to:

- Facilitate the settlement of boundary disputes through the interface of local governance and indigenous knowledge systems and practices of conflict resolution and management;
- Provide assistance in preventing the escalation of conflicts that could lead to tribal wars due to territorial boundary disputes;
- Document the processes undertaken during dispute settlement; and,
- Prepare the groundwork for actual delineation and conversion of CADCs to CADTs — a prerequisite of which is the absence of boundary conflicts.

The critical components of ICRMP are capacity-building; organizational strengthening; conflict management and resolution; and process documentation. As part of the capacity-building component, a training program on community land use planning and Participatory 3-D modelling<sup>3</sup> (P3DM) was designed in coordination with the Philippine Association for Intercultural Development (PAFID), to be put into action in the municipality of Balbalan, in Kalinga Province (OPAPP, 2000a).

<sup>3</sup> On 4 January 2001, the Philippine Department of Environment and Natural Resources institutionalized P3DM, by virtue of Memorandum Circular No. 1, S. 2001, as a process to be adopted in protected area planning and sustainable natural resource management.

## The Office of the Presidential Adviser on the Peace Process

OPAPP was established by then President Fidel V. Ramos in 1993 through Executive Order No. 125 as the lead agency tasked with managing and supervising the comprehensive peace process in the Philippines (OPAPP, 2000a). Its administrative and technical functions evolved largely from two government entities, namely the Office of the Peace Commission (OPC) and the Philippines National Unification Commission (NUC). The subsequent Arroyo Administration prioritized the continuation of the peace process, a key aspect of which was the direct participation of communities in governance and in the management of local issues that directly affect peace and development. Then and now, OPAPP's assistance in this regard includes the provision of technical and financial support to prevent, mediate, or resolve conflicts as well as to enhance local capacity in conflict management. OPAPP also facilitates intertribal conflict resolution through area-based dialogues in coordination with support groups and agencies, and conducts research and documentation of indigenous conflict management and resolution practices (OPAPP, 2000a).

To implement the ICRMP, a series of workshops was held to establish municipal Conflict Management Committees (CMCs). The CMC, which is multi-sectoral in nature, is usually headed by the local chief executive, and composed of representatives from the local government units (LGUs), the church, people's organizations, and other stakeholders present in the locality. The composition of the CMC may vary according to the nature of the conflict. OPAPP provides technical and financial support and has no membership in the committees, like the tribal elders who maintain a lead role in active negotiations.

The CMCs' tasks include coordinating the conflict management and resolution process; implementing identified critical interventions; convening meetings and consultations; guaranteeing mobilization and full participation of all parties to the conflict during negotiations; ensuring and facilitating compliance with agreements or resolutions made; recording, consolidating outputs of meetings and consultations; and, maintaining records and documents used during the negotiation processes.

### The Balbalan case

In 1966, the Mountain Province — a landlocked province in the Cordillera Administrative Region in Luzon — was subdivided into four provinces by virtue of Republic Act (R.A.) 5695. One of the provinces included both Kalinga and Apayao. In 1992, in accordance with R.A. 7878, Kalinga became a separate province, with eight municipalities: Balbalan, Pasil, Lubuagan, Pinukpuk, Rizal, Tabuk, Tanudan, and Tinglayan. Administrative boundaries of the municipalities were mapped, without undertaking a proper consultative process nor considering local cultural and environmental settings. Balbalan encompasses the Balbalasang-Balbalan National Park, which is considered, from a biodiversity point of view, as one of the most interesting sites in Northern Luzon. The

Park, covering a total area of 1,338 hectares, was established in 1972 and proclaimed in 1974. Its expansion to approximately 16,700 hectares and its conversion into a Natural Biotic Area is being considered by the DENR (Lepiten-Tabao *et al.* 2001). The Park is located in the 533,200-hectare<sup>4</sup> ancestral domain of the Balbalan Municipality in Kalinga Province. Balbalan consists of 14 smaller administrative units (*barangays*) and is home to the Kalinga ethno-linguistic group, specifically to seven sub-groups: Banao, Buaya, Dao-angan, Mabaca, Gubang, Poswoy and Salegseg.

Between February 1996 and June 1998<sup>5</sup>, DENR issued 23 Certificates of Ancestral Domain Claims (CADCs) within the Cordillera Administrative Region, including one in favor of Balbalan. As was the case in the other municipalities that received CADCs, OPAPP facilitated consultations with local communities to formulate ancestral domain resource management plans with the assistance of local NGOs.

The CADC recognizes the rights of indigenous peoples (IPs) and indigenous cultural communities (ICCs) allows IPs and ICCs/IPs to use the ancestral land to profit from it or to enrich their cultural heritage.

Thus, like many other CADC holders, Balbalan signified its intention to have its CADC converted into a CADT. However, Balbalan had to ensure that there were no boundary conflicts in the municipality, which was a prerequisite for converting CADCs to CADTs.

A number of concurrent factors contributed to escalating boundary conflicts. These included the assimilation of Balbalan into the centralized institutional framework of Kalinga Province, and the resulting top-down delineation of administrative boundaries, the allocation of Internal Revenue Allotments<sup>6</sup> (IRA), development pressures linked to the discovery of mineral deposits and geothermal resources, and the increasingly perceived value of water as a finite resource.

## The conflict resolution process

The process started in August 1999 with an internal Conflict Management Assessment (CMA) that led — through the active participation of all concerned parties — to the identification of the conflicts, their causes and the common benefits which would derive from their solution (OPAPP, 1999). Balbalan representatives identified 18 boundary conflicts, involving seven different ethno-linguistic groups, 14 *barangays* and three municipalities, and defined conflict as “the absence of peace, personal or social, with violent or cold manifestations brought about by, but not limited to the following (OPAPP, 2001a):

- Violations of the *bodong* (see box story) and/or its elements;
- Infringement of personal rights;

<sup>5</sup> Memorandum Order No.15 Series 1998 instructed field offices of DENR to stop processing and issuing CADCs and CALCs.

<sup>6</sup> IRA is allocated to each administrative unit on the basis of three criteria having different weights: population (50 percent), land area (25 percent) and equal sharing (25 percent).

- Theft;
- Inter-personal, inter-family or clan, inter-village and inter-group differences;
- Unclear, ambiguous, or unknown administrative boundaries;
- Issuance of dubious or inappropriate tenurial instruments;
- Development aggression by government and private entities; and,
- Ideological differences.

Cross-cutting benefits from a clear definition of the administrative boundaries would include the possibility of pursuing the conversion of the CADC into a CADT and ease in preparing Barangay and Municipal Development Plans for the purpose of accessing development funds.

Most issues were intertwined and analysis showed that the conflicts were largely categorized into the following:

Conflict	Issues
Inter-tribal	Resource use, tribal disagreements, cultural boundaries
Inter- <i>barangay</i>	Administrative boundaries; resource use and access; internal revenue allotment
Inter-municipal/provincial	Administrative boundaries; resource use and access; internal revenue allotment

The CMC agreed that OPAPP’s assistance would focus on external or inter-municipal conflicts, while local government units would handle inter-tribal and inter-*barangay* conflicts.

Unlike those in other municipalities, the CMC in Balbalan decided to address *barangay* conflicts simultaneously.

Towards the end of 1999, almost all inter-*barangay* conflicts appeared to have been settled while the inter-*barangay*/municipal conflicts remained unresolved. These included the following:

- Banao Peoples (Barangays Balbalan, Balbalasang, Talalang, and Pantikian) versus Balatoc Peoples (Barangay Balatoc, Pasil Municipality)
- Mabaca Peoples (Barangay Tawang) versus Daga People (Barangay Daga, Conner Municipality); and,
- Poswoy Peoples (Barangay Ab-abaan) versus Limos People (Barangay Limos, Pinukupuk Municipality).

<sup>7</sup> The MOA has been conceived as a modern version of a peace pact, but is limited to the description of the outlining of the boundaries and does not include by-laws.

Most conflicts focused on resource use and access and were “resolved” by updating existing peace pacts, with attached sketch maps, and signing Memoranda of Agreement<sup>7</sup> (MOA), which dealt specifically with a description of the boundaries. However, geo-referenced information like sufficiently large-scaled maps or aerial photography, was not used.

There was little follow-up in the first part of year 2000 due to the change in government, from the Estrada to the Arroyo Administration. Activities resumed in the second half of 2000, with the organization of a municipal-wide participatory 3-D modelling (P3DM) exercise designed for land use planning, preparation of Balbalan’s Ancestral Domain Resource Management Plan, as well as for the verification of details, including locations, landmarks and boundaries of existing peace agreements. In addition, the model was to be tested as a tool for conflict resolution for the pending cases.

### **The participatory 3-D model (P3DM)**

The P3DM exercise in Balbalan started in November 2000. Participants from all the 14 barangays, including all Barangay Captains<sup>8</sup>, constructed a 1:5,000-scale geo-referenced model covering an area of approximately 70,000 hectares.

Contours for the area were obtained from maps produced by the National Mapping and Resource Information Authority and blown up to the desired scale. Local participants traced the single contour lines on rubber sheets, cut them out and pasted them one on top of each other, thus forming the scaled relief of the entire municipality.

Land use and cover, settlements, and a number of other features were depicted at a later stage based on the individual cognitive maps of the participants. In doing so, data, including names of features, were discussed and agreed upon.

It is important to recall that the different ethno-linguistic groups used different names for the same landmarks, such as creeks, rivers, peaks, hills, or others. By providing a common vantage point, the model offered, for the first time, an opportunity for all concerned groups to level off their understanding of the territory.

The accurate 3-dimensional depiction of terrain, land use, and vegetation cover, as well as common denominations for selected landmarks, served as basis to countercheck the earlier signed MOAs and Peace Pacts, with regard to the outlining of boundaries. In trying to display the boundaries as described in the MOA and peace pacts, which were signed one year earlier, new disputes surfaced. Some were settled amicably by negotiating the position of the boundary (visualized on the model by a yarn), consequently updating the MOAs. Others triggered new confrontations. Initial negotiations were held by the Barangay Captains, but final agreements on boundary outlining had to be validated and endorsed by the Elders.

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<sup>8</sup> Barangay Captains are elected representatives of the *barangay*. They are political leaders.



## Bodong — The traditional peace pact

Traditionally, disputes among neighboring villages or ethno-linguistic groups have been resolved by peace pacts, or *bodong*. The *bodong* is a written bilateral agreement defining inter-tribal relationships that minimizes traditional warfare and serves as a mechanism for the initiation, renewal, maintenance, and re-enforcement of social ties. In recent years, the *bodong* system has been expanded into a multilateral peace pact to foster unity in the Cordilleras.

Peace pacts were and are developed by individuals who carry the responsibility for their implementation on behalf of the group they represent. The agreements define physical boundaries between the economic and cultural domains of the signatories and lay out by-laws governing infringements in the use and access to resources, personal security, and belongings. Boundaries are mainly described and occasionally depicted by supporting sketch maps. According to precise rules, the responsibilities attached to the pacts are inherited by a close kin upon the death of the holder. Being passed on from generation to generation, the pacts have to be regularly renewed to maintain a common understanding of boundaries, rules and by-laws. In addition, their renewal or “warming up” involves a revision and re-negotiation of their provisions. In some cases, a *bodong* becomes “dormant” if, upon the death or departure of the holder, it has not been properly transferred, thus potentially creating a breeding ground for conflict.

Conflicts evolved along different pathways.

The boundary dispute between the Banao and Balatoc peoples heated up and three attempts were made by the CMC to settle the conflict in 2001. At that point, the tribes were on war footing, although there was no actual eruption of violence. Negotiations, revolving around the 3-D model as a spatial reference, continued in 2002. In April, the process came to a fruitful conclusion, and the MOA and the peace pact were signed. The boundary dispute between Barangay Mabaca and Barangay Buaya remained unresolved. In this case, one Barangay Captain failed to accept the revised boundary that had been endorsed by the Elders.

For the remaining cases, the outlining of *barangay* and municipal boundaries was agreed upon by all contending parties.

In support of the data displayed on the 3-D model, the voluminous process documentation included the description of the boundary corners and the names of the individuals who would be responsible for their identification during the subsequent ground survey.

This final act, which concluded the peace process, was conducted with the assistance of a licensed geodetic engineer, as required by Administrative Order (AO) issued by the NCIP (NCIP, 2002). The fact that the elders and the *barangay* captains already defined a



## Community-based mapping as tool for resolving disputes over ancestral land

In remote, poorly served areas, community-based mapping methods can help in addressing boundary issues through the visualization of the landscape, associated land uses, and settlement patterns. Since 1987, scaled relief models have been used in Northern Thailand to deal with conflicts among ethnic minorities and between government agencies (Tan-Kim-Yong et al. 1994; Srimongkontip, 2000; Hoare et al. 2002). In the Philippines, the use of 3-D models started later in 1993. Integrated with Geographic Information Systems (GIS) and Global Positioning Systems (GPS), Participatory 3-D Modelling (P3DM) has been used among indigenous peoples under the auspices of the Department of Environment and Natural Resources (DENR) and lately, of the Office of the Presidential Adviser on the Peace Process (OPAPP).

survey plan represented a reasonable guarantee of the respect for the right to self-delineation as enshrined in IPRA.

### Derived maps

In collaboration with the local communities, the data depicted on the 3-D model was extracted and imported into a GIS environment. Thematic maps were produced and validated by the different groups.

The model and derived maps were used to prepare Barangay and Municipal Development Plans and to update the 1999 Ancestral Domain Resource Management Plan. The latter included the proposal for the establishment of an Ancestral Domain Park in lieu of the existing National Park. In addition, the maps were attached to the memoranda and peace pacts.



*Contending parties shake hands as a sign of reconciliation.*

## **The role of the 3-D model in the negotiating process**

### ***Adding a shared perspective and common language***

Different opinions are frequently based on different perspectives and the quality of the media used to communicate. The conflicts in Balbalan illustrated this point. Their origin was essentially territorial and related specifically to boundaries that had been agreed upon by Elders and handed down from generation to generation as written documents with an oral descriptive support. The visualizing instruments at hand were at best sketch maps.

The municipality maintained the same visualizing pattern in dealing with the settlement of most disputes in the year 1999, as evidenced by the Ancestral Domain Resource Management Plan comprising 28 sketch maps. Due to the lack of specificity and geographic accuracy — thus leaving considerable space for subjective interpretation — the settlements appeared to be short-lived once confronted with the holistic and geo-referenced perspective offered by the 3-D model, which effectively established a common vantage point for understanding the territory.

Through the use of the relief model, it became apparent that diverse ethno-linguistic groups were using different names for natural landmarks, like creeks and peaks. For instance, residents of different locations construed “the boundary running along the highest mountain” depending on their own viewpoint. Different denominations and interpretations of landmarks and features were ineluctably sources of disagreement.

When a process is geared towards addressing conflicts bound to the territory, communication systems are essential tools to provide all parties with equal access to information in order to develop a common understanding of the issues at stake. When language barriers, like the ones existing among the Elders of different ethno-linguistic groups in the Cordillera, presented an additional constraint, information exchange was more effectively conducted via visual communication based on color, shape, and texture, like in a 3-D model.

In such context, there is no doubt that the third dimension and the holistic view offered by the relief model were key factors in facilitating the consolidation of the negotiation process: there was only one highest mountain and one creek so-and-so to be named, seen, felt, and touched by all concerned.

### ***Enhancing learning capacity and the power of mind***

Spatial knowledge develops in humans through three progressive stages, including landmark, route, and survey knowledge. The first one refers to the capacity to memorize places in relation to an event; the second, to develop the sense of ordered sequences of



*Boundaries were visualized by color-coded yarns, a flexible coding system that can accommodate multiple adjustments.*

landmarks. The last and more progressed stage is that where the knowledge simultaneously embraces more locations and their interrelations, and allows for detouring, shortcutting, and creative navigation (Montello, 1997).

This was the learning itinerary undertaken by informants to depict the landscape on a blank relief model. At first, they looked for landmarks to establish their physical location vis-à-vis the model. Shortly, they were able to locate themselves and/or their households, and to establish spatial relationships between the different landmarks. Once this was done, informants were able to link the model to the real world and to be in a position to precisely depict their mental representation of space.

Experiences gained in Balbalan and in other places, where participatory 3-D modelling has been used, have shown that when informants are provided with a blank relief model, instead of a blank contour map or a blank sheet of paper, they can easily depict their spatial knowledge in a scaled, geo-referenced manner and add a lot of precise details. The fact that relief models facilitate scaling allows for filling in information more fully and accurately on a given area. This facilitates a precise and comprehensive understanding of the entire landscape. This is not the case in sketch mapping, a practice

<sup>9</sup> Thanks to the variety of coding means (paint, yarns, and pins), a 3-D model, can accommodate overlapping layers of information like, for example, land use and land tenure depicted by color-coded paints and yarns, respectively.

traditionally used to substantiate the descriptive portions of peace pacts and widely adopted in the context of participatory development. The difference between a blank contour map and the relief model is the physical vertical dimension, which provides essential cues for stimulating memory and for establishing spatial associations.

In addition, by providing a bird's eye view, and by accommodating different layers of information,<sup>9</sup> the relief model has contributed to widening the participants' evaluative frame of reference on spatially defined issues, and thus stimulated active learning and analysis. In other words, it has helped participants in understanding ecological and social dynamics that go beyond their individual cognitive boundaries.

### ***Increasing access to information and adding transparency***

The success of a negotiation process frequently depends on providing concerned parties with open access to information. For conflicts bound to the territory, like the one in Balbalan, the 3-D model has offered for the first time a comprehensive, detailed visual representation of the entire territory of the municipality and bordering *barangays*, therefore adding transparency to the process and reducing the space for subjective interpretations.

### ***Deciding on what is relevant***

A 3-D model is meant to distinguish the territory with the use of coded polygons, lines, and points. Each feature needs to be identified, defined and linked to a particular symbol. All these symbols and their descriptions are summarized in the form of a map key or legend, which is the graphic vocabulary that allows users to decode and interpret displayed data. The preparation of the legend, particularly the listing and description of the different items, is a key factor that determines the usefulness of the model as a communication means and the final intellectual ownership of the output. In the case of Balbalan, the legend included 23 different features, all of which had been identified and defined by the participants according to commonly agreed criteria and most importantly according to what the different groups perceived as relevant, making the "vocabulary" of the medium open and transparent.

### ***Peer-to-peer communication with the outside world***

In order to translate cognitive maps into high quality geo-referenced information, P3DM has been integrated with GIS and GPS. This has brought about the reproduction of people's knowledge in a cartographic, mobile, and reproducible format that is accepted at institutional levels as part of a negotiation process.

In the Philippines, the concurrence of such technical elements, the existence of a favorable regulatory framework – from which the Balbalan case has benefitted – and a supportive NGO advocacy, have been instrumental to improving the capacity of

communities to interact with national and international institutions and finally to induce substantial nationwide change in terms of resource allocation and management.

## **Additional factors which contributed to the negotiation process**

### ***The capacity for accommodating change***

It is worth recalling that an interactive process involving 3-D modelling may form the basis for constructive action but that it may also be instrumental in making latent conflicts explicit. Therefore, it is important that the process – like in the case of Balbalan – be carefully prepared, well-managed, and embedded in a long-lasting, articulated intervention, such that new realities emerging from the process can be accommodated (Leeuwis et al., 2001).

### ***Building on underlying needs***

The identification of underlying factors that could facilitate a consensual resolution of conflicts is extremely important. The benefits deriving from the settlement would override the trade-offs necessary for its achievement. In the case of Balbalan, there were two such important factors. The long-lasting boundary disputes hampered the municipalities from preparing proper development plans, which they needed to access funds for the plans' implementation. Secondly, the absence of boundary conflicts was a pre-requisite for converting the existing CADC into a proper title (i.e., CADT).

### ***Third-party and mutual trust***

One determining factor in the process has been the composition of the mediating body, including OPAPP, experienced NGOs, the church and LGUs, and in some cases neutral ethno-linguistic groups. The rapport these parties have developed with the contenders is likewise important. Only once sufficient trust, effective communication and transparency have been developed could collaborative negotiations start and lead to better anchored, likely stable solutions.



*Elders representing opposing groups engage in discussions.*

## ***Traditional mechanisms***

Last but not the least is the fact that the process has evolved along traditional conflict-resolution patterns, leaving the chief negotiating role in the hands of the Elders and maintaining the traditional *bodong* as an integral component of the final settlement.

## **Conclusion**

This preliminary assessment of the Balbalan case indicates that the use of a 1:5,000-scale relief model, encompassing the entire municipality and portions of the neighboring municipalities, has been instrumental in facilitating a series of consensual conflict-resolution processes. Almost all have led to potentially stable solutions, anchored on objectively verifiable, geo-referenced sources, including a 3-D model, derived map, and the technical descriptions that will be produced by the forthcoming ground survey. In the light of growing development pressures, agreements that are based on sketch maps and non-technical descriptions appear to be short-lived because these are prone to subjective interpretations.

In addition, the model has contributed to improving communication by creating a shared vantage point and a common visual vocabulary, thus bridging communication barriers that result from different perspectives and spoken languages. ■

## **Final note:**

In the framework of the Integrated Conflict Resolution and Management Programme, OPAPP now supports the construction of Participatory 3-D models in other municipalities in the Cordillera.

## **Disclaimer:**

*The designation employed and the presentation of material in this article do not imply the expression of any opinion whatsoever on the part of the authors, concerning the legal status of any country or territory, administrative unit or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.*

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