

Support the spread of “good practice” in generating, managing,
analysing and communicating spatial information

Participatory 3 Dimensional (P3D) Modelling

An introduction

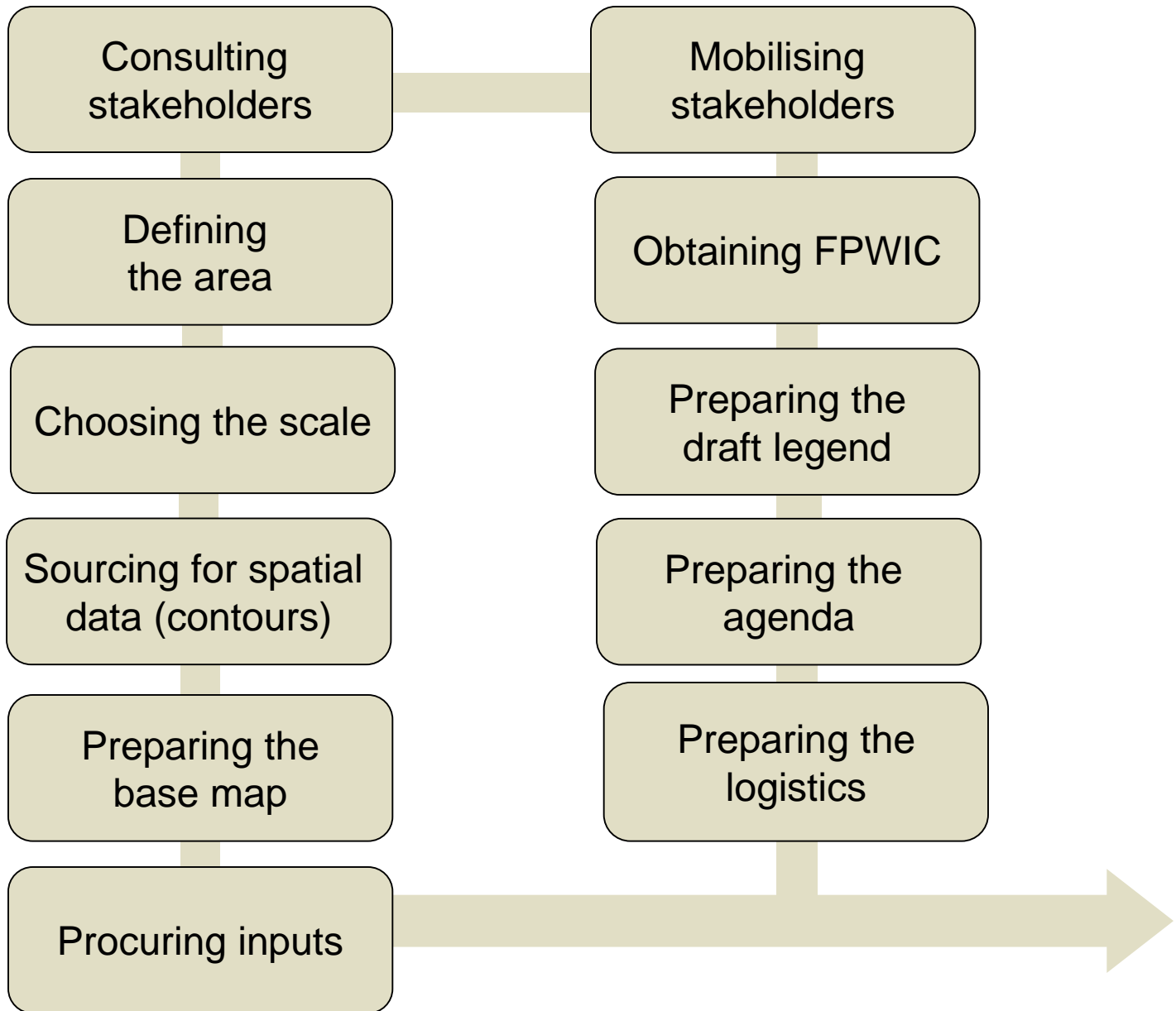
Courtesy: Giacomo Rambaldi



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The Preparatory Phase





Geographical scope

- The concerned communities should select the area to be mapped.
- Pay attention to the:
 - purpose of the mapping exercise;
 - Watersheds/sub-catchments;
 - cultural domains;
 - Territorial zones (municipality).

Choosing the scale

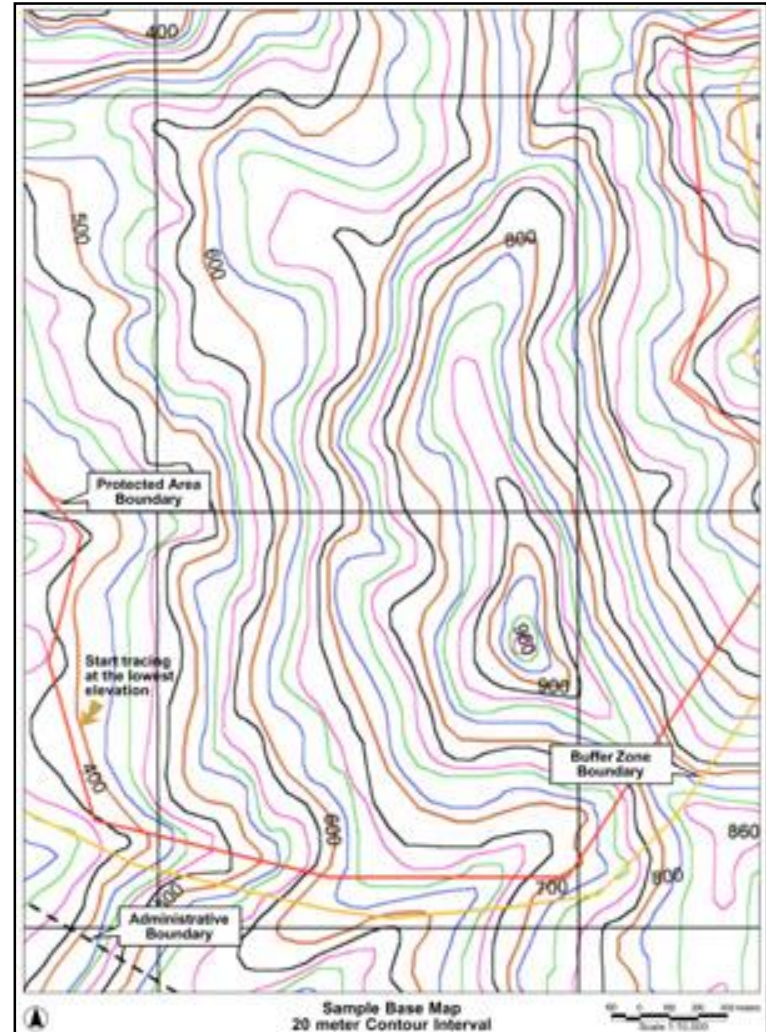
- 1:10,000 scale: 1 cm on the map equals 100 metres on the ground
- 1:5,000 scale map: 1 cm on the ground equals 50 metres on the ground
- At scales smaller than 1:15,000, informants have difficulty precisely locating features
- P3DM is best done at scales $> 1:10,000$

Choosing the scale

- Given a defined project area, the choice of scale will determine the size of the model

Preparing the base map

- Ensure that:
 - contour lines are coloured in a repeating sequence
 - labels (many) show elevation in metres
 - a grid is added
 - the lowest elevation contour line is clearly identified
 - you get at least two copies of the base map

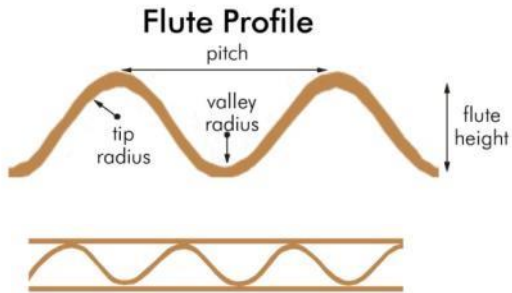


Procuring inputs

- Procuring inputs is a critical step in organising a P3DM exercise because you:
 - cannot run out of materials during the P3DM workshop
 - must ensure that all participants are given the chance to actively participate and that nobody feels excluded
 - must have enough materials to accommodate the unexpected

Materials to reproduce contour intervals

Carton board



Expanded EVA/PE closed-cell foam



Images by PAFID

Push and map pins for points

- Examples of point features:
 - Water point
 - Household
 - School
 - Health centre



Yarns for linear data

- Examples of line features:
 - Road
 - Foot trail
 - Water course
- Examples of areas:
 - Malaria-infested area
 - Flood-prone area



Image by Giacomo Rambaldi

Paint for polygons

- Examples of point features:
 - Grassland
 - Water body (lake)
 - Paddy field
 - Orchard
 - Dark forest
 - Bamboo forest
 - Landslide



Image by Giacomo Rambaldi

Overlapping features

- Yarns can be used to add data sets on top of other layers
 - For example, a coastal area (light blue paint) is considered a no-touch zone (orange yarn identifies the boundaries of the zone)

Scaling and referencing



Image by Giacomo Rambaldi

P3DM logistics

- P3DM logistics are complex because facilitators have to:
 - convene 20-30 people at a time;
 - accommodate and feed them for 1-2 days;
 - ensure that participants represent adjacent villages to facilitate cross-verification;
 - ensure that all have a role to play during the workshop.

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Manufacturing the Blank Model

The youth at work



Tracing, cutting and pasting



Images by Giacomo Rambaldi

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Data Input

The turn for the custodians of knowledge



Orientation, here we are!



Photograph courtesy of G. Rambaldi



Image by Giacomo Rambaldi

Transfer of spatial knowledge



Photograph courtesy of G. Rambaldi



Image by Giacomo Rambaldi

Transfer of spatial knowledge



Photograph courtesy of G. Rambaldi



Image by Giacomo Rambaldi

Data management

Extracting data from
the 3D model

Digitising, organising
and editing data

Cartographic
processing

Plotting
thematic maps

Comparing data from
different sources

Cross-checking and
validating

Various purposes

Thematic maps,
GIS and database
information



Participatory 3D Modelling Process

A process wherein traditional spatial information is combined with people's spatial knowledge



Image by Giacomo Rambaldi



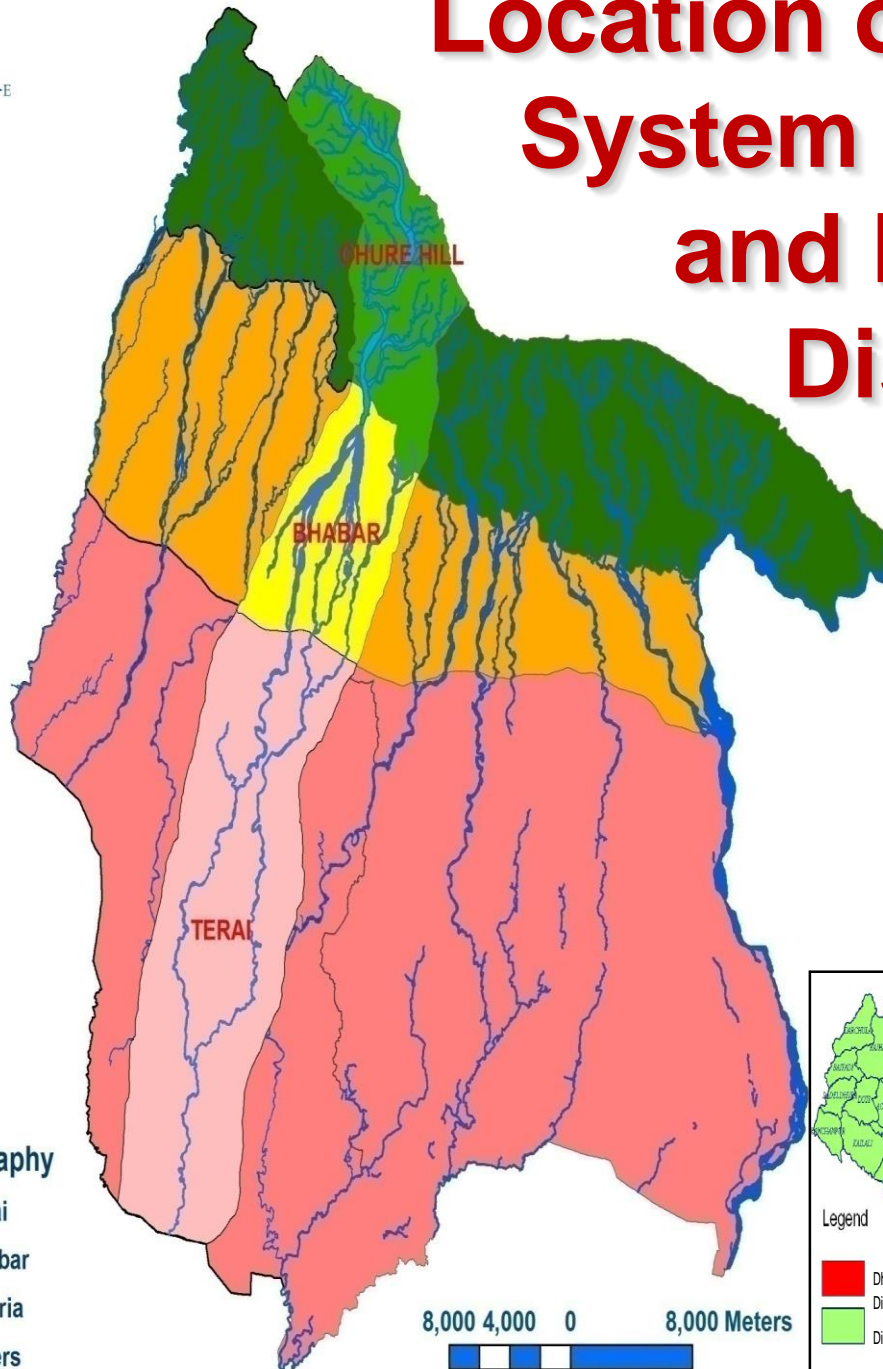
Working District- Mahottari & Dhanusa

This project is focused in the Chure range including 2 Districts (Dhanusha and Mahottari).

Project Location		Activities
Bardibas MC-1,4,5,6		➤ Underground Irrigation Canal improvement
Khairmara VDC - 6,8		➤ Seepage water raising program
Hatisarba VDC-1,4,5,6,7		➤ Watershed Conservation pond
Singiyahi VDC-4,5,6		➤ Gully treatment, Landslide treatment, Torrent treatment ,
Dhamaura VDC-3,5,8		➤ Degraded land rehabilitation Dam side plantation,
Mahottari District		
Tulasi-VDC - 5,6,7,8,9		➤ Water Source Protection
Bengadabar VDC-9		➤ Underground Irrigation Canal improvement
Dhanusha District		➤ Seepage water raising



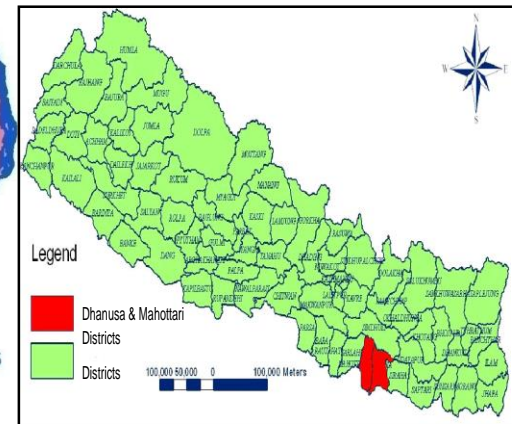
Location of Ratu River System in Mahottari and Dhanusa Districts



Legend

Physiography

- Terai
- Bhabar
- Churia
- Rivers



Legend

- Dhanusa & Mahottari Districts
- Districts

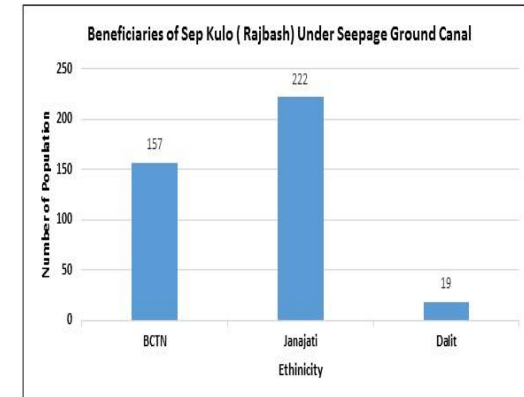
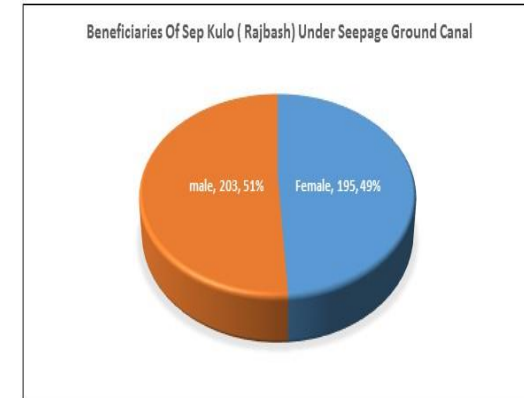


Model 2 (Raising of Seepage Water for Irrigation- location in Mahottari)

Under Ground canal for Irrigation
Rajbash, Bardibash-6, Mahottari



Under Ground Seepage Canal for Irrigation
Rajbash, Bardibash-6, Mahottari





Model 2 (Raising of Seepage Water for Irrigation)











Participatory 3D Modelling

- An efficient method to facilitate learning and analyse issues related to territory
- Integrates local spatial knowledge with data about elevation (for land) and depth (for sea)
- Physical output is a stand-alone, scaled and geo-referenced relief model
- Works best when integrated with Global Positioning Systems (GPS) and Geographic Information Systems (GIS)

The P3DM process

- Contour lines are used as templates for cutting out sheets of carton board or EVA.
- A map legend is produced using vernacular terms.
- Local spatial knowledge is depicted by the use of push pins for points, yarns for lines and paint for polygons.
- The model remains with the community upon completion.

Examples from across the globe

Nepal



Examples from across the globe

Nepal



Examples from across the globe

3D model in the Philippines



3D model in Viet Nam



Images by Giacomo Rambaldi

Examples from across the globe

3D model in Fiji



3D model in Kenya



Distribution of P3DM





- In 2007, Participatory 3D Modelling was granted the **World Summit Award** in the e-culture category.
- P3DM (the product) was considered to be one of the 40 best practice examples of quality e-content in the world.

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Strengths



Knowledge and learning

- P3DM facilitates:
 - the visualisation of mental maps
 - the emergence of tacit knowledge
 - the visualisation of invisible features like values, tenure, cultural domains and sacred areas
 - intra- and intergenerational knowledge exchange

Knowledge and learning

- P3DM stimulates:
 - the desire to discover
 - spatial learning and analysis

Self-esteem and social cohesion

- P3DM:
 - fuels self-esteem, raises awareness on linked ecosystems and strengthens intellectual ownership of the territory
 - enhances the role of elders as custodians of traditional knowledge
 - offers literate and non-literate people equal opportunities to participate

Knowledge and cultural transmission



Communication

- P3DM:
 - offers a bird's-eye view of the territory
 - provides insiders a medium for dialoguing with outsiders
 - offers a common perspective for negotiation and conflict management
 - facilitates communication which occurs with symbols (i.e. visual language)

Visual language

- Participatory legend making:
 - leads to generating the visual vocabulary of the model
 - allows for greater clarity about meanings
 - maps the relationships between natural and cultural features
 - puts the knowledge holders in the driver's seat

Knowledge exchange

- The P3DM process:
 - reclaims lost memories about the traditional ways of living
 - facilitates intergenerational knowledge exchange
 - raises awareness across generations about the status of the environment

Relevant data

- The P3DM process:
 - leads to the collation of data which are:
 - geo-referenced
 - actual and relevant
 - understandable to all parties
 - intellectually owned by the participants
 - generates a scaled version of the real world

Scaled reality

- The P3DM process generates a scaled version of the real world which:
 - allows map makers to cover large and remote areas working out of one place
 - overcomes logistical constraints to public participation

Conflict management

- Participatory 3D models offer shared vantage points and a common visual vocabulary. They:
 - are instrumental in bridging communication barriers;
 - facilitate dialogue;
 - limit subjective interpretations;
 - set the basis for fruitful negotiations.

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Weaknesses

Weaknesses

- P3DM needs:
 - time to conduct preparatory activities
 - contour lines of the area to be mapped
 - accurate procurement of supplies
 - skilled multidisciplinary facilitation
 - space to store and display the output
 - a caretaker
 - a mobile alter ego ... derived maps

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Opportunities



Opportunities

- Conduct collaborative research
- Develop resource inventories
- Develop management plans
- Enable self-determination
- Manage and ameliorate territorial conflicts

Opportunities

- Safeguard ever-evolving, intangible cultural heritage and build identity
- Support good governance regarding transparency and consensual spatial decision making
- Raise awareness and assist with education and social learning