Seamless Integration of Management Planning for Local Ecosystems

A Practitioner's Guide to FLUP-CHAMP for CLUP Harmonization and Integration

Imprint

Contents

Table of figures

List of Acronyms

A&D	Alienable and Disposable
BDV	Biodiversity
BMU	German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
CADT	Certificate of Ancestral Domain Title
CCA	Climate Change Adaptation
CDP	Comprehensive Development Plan
CHAMP	Critical Habitat Management [Planning] Platform
CLUP	Comprehensive Land Use Plan
CRMP	Coastal Resource Management Plan
CSO	Civil Society Organization
DAR	Department of Agrarian Reform
DENR	Department of Environment and Natural Resources
DRM	Disaster Risk Management
E	Elevation
EMIS	Extent-Magnitude-Importance-Special Sensitivity
EO	Executive Order
FEA	Forest Ecosystem Analysis
FFL	Forest and Forestlands
FLUP	Forest Land Use Plan
ForClim	Forest and Climate Protection Panay
FPA	Forest Protection Area
GIS	Geographic Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
GPS	Global Positioning System
Ha	Hazzard
iGoFLUP	Innovative, Governance oriented Forest Land Use Planning
IKI	International Climate Initiative
Inf	Infrastructure
IP	Indigenous People
LC	Land Classification
LCE	Local Chief Executive
LGU	Local Government Unit
M&E	Monitoring and Evaluation
MAO	Municipal Agriculturist Office
MDC	Municipal Development Council
MENRO	Municipal Environment and Natural Resources Office(r)

MORE FLUP	Managing Outcomes and Results for Enhancement of FLUP
MPDC	Municipal Planning and Development Coordinator
MTWG	Municipal Technical Working Group
NCIP	National Commission on Indigenous People
PESTEL	Political, Economic, Social, Technological, Environmental, Legal
PFA	Production Forestry Area
PLUC	Provincial Land Use Committee
PPP	Public Private Partnership
RRA	Rapid Resource Appraisal
R&D	Research and Development
S	Slope
SeBa	Settlement at Barangay level
SB	Sangguniang Bayan
Te	Tenure
VC	Vegetation cover
WD	Watershed & Drainage
WFLAD	Watershed-Forestland-Ancestral Domain
ZO	Zoning Ordinance

Introduction

The Forest and Climate Protection Panay Project (ForClim) supported 21 Local Government Units (LGUs) with the development of their Forest Land use Plans (FLUPs) and assisted 13 LGUs with the integration of their FLUP into the Comprehensive Land use Plans (CLUP).

The ForClim Project was funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) through its International Climate Initiative (IKI) and jointly implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and the Department of Environment and Natural Resources (DENR) Philippines.

Figure 1 shows the FLUP and enhanced CLUP process, depicted over the landscape of Tapaz, illustrating the key steps where the two planning processes achieve coherence. This creates synergy and removes the tensions, associated with disparate planning platforms from two separate national agencies. iGoFLUP (innovative, Governance oriented Forest Land Use Planning) was coined as a social marketing message to motivate LGUs to enroll into the technical assistance program for FLUP formulation.

FLUP process

Enhanced CLUP

Data and map collection

Situational analysis

Watershed prioritization/ FFL allocation

Plan formulation

Data collection, mapping, validation

Situational analysis

Forest and forestland zoning

Strategic directions setting and investment prioritization
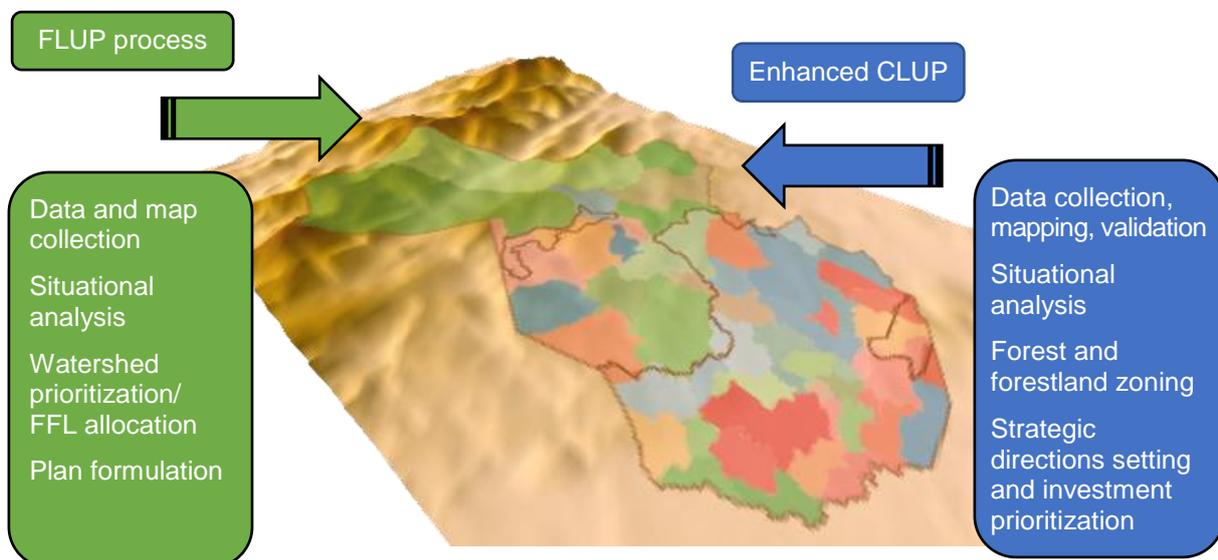
Figure 1: Seamless integration of management planning for local ecosystems – innovative, governance-oriented forest land-use planning (iGoFLUP)

1 Developing the FLUP CHAMP (Critical Habitat Management Planning Platform) for CLUP Scorecard

1.1 Introductory Note

A device to aid the Provincial Advisory and Assistance teams, including the Provincial Land Use Committee (PLUC), in the assessment and performance of the LGU Municipal Technical Working Group (MTWG) in the conduct of FLUP-CHAMP planning was developed as a multi-institutional stakeholder tool.

The **scorecard** system takes stock of different benchmarks of technical, process and governance performance from the point of view of relevant institutional partners, looking at the formulation system, as a whole. It can serve as a gauge to assess the intellectual assets of the LGU organization (skills and knowledge base, expenditure on enhancement of these assets, R&D,

training and development, introduction of new products or services, employee morale and productivity). The scorecard can also serve as a means to gauge process sensitivity to the FLUP "Public", the citizen-customer, seeking quality of goods and services, and achieving customer satisfaction.

Towards the end, the FLUP process should lead to the organizations' environmental and forest land use policy, and bringing them in line with new policies, laws and regulations. Equally important would be the capitalization for sustainable forest management measures, including disclosures of anticipated investments to support FLUP-CHAMP measures in the field.

1.2   Design, Application Scope and Guiding Concept

The desired scope of the scorecard system is to cover horizontal and vertical aspects of integrated planning. The benchmarks are indicative and can be improved based on shared understanding of the assistance teams. The system, will adopt the Delphi Method and shall be consolidated, analyzed and shared as a consensus document, rather than referring differentially to individual scores.

Benchmarks cover the range of:
- Adequacy of participatory processes and tools to understand current conditions as a means to engage and enable working groups and individuals
- Adequacy and quality of technical processes and devices to ensure representativeness of data and information
- Policy and Management Systems
- Organizational Development

The scorecard's guiding concept is to move LGU managers away from focusing purely on technical outcomes and to consider a more balanced portfolio of multiple financial and non-financial measures closely linked to strategic objectives. After all, no single performance indicator can succinctly capture the complexity of how an entire LGU organization is performing. Scorecard measures are selected to describe and monitor the organization's progress in implementing and achieving its strategy. Monitoring these measures enables management to plot the future competitive direction of the organization. This shift in focus, from operational activity to strategic guidance, has become increasingly important as external competitive environments have become more dynamic and internal organizational structures have become more fluid and complex.

A properly executed balanced scorecard[1] process requires every level of the LGU organisation to have a clear and agreed understanding of:
- Why the organization exists – its fundamental goal
- The organization's values
- The organization's vision for the future
- The critical measures that will make a real difference to the organisation's performance;
- Who the stakeholders are and how their views can be collected and reflected in the respective quadrants of a balanced scorecard, and
- How the quadrants and measurements link together (causal links) to ensure the organisation moves towards its strategic goals and objectives.

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[1] Kaplan RS and Norton DP (1996) The Balanced Scorecard: Translating Strategy into Action. Harvard Business School Press.

1.3 Scorecard Table

PARAMETER	Key representative processes	FLUP – CHAMP platform support	Score (1-5)
1. Governance (30%)	(e.g. EO, capacity building, please put key remarks)	(FLUP protocols adopted, pls put a check)	
1.1. Organization of MTWG			
1.2. Participation of CSOs			
1.3. LGU Staff Support			
1.4. Gender and Development			
1.5. SB Participation			
1.6. LCE engagement			
1.7. Sufficiency of Public consultations			
1.8. Financing Equity (LGU contribution, other sources)			
1.9. Complete Staff Work			
1.10. Viability of Work and Finance Plan			
2. Technical (40%)			
2.1 Sufficiency in the use of PRA tools for resource mgt. appraisal			
2.2 Validation of community-generated maps			
2.3 Representativeness of data (Biodiversity, Socio-Economic) in relation to Ecological Zones			
2.4 Completeness/correctness of map data			
2.5 Comprehensive inclusion of Stakeholder Analysis			
2.6 Use of actual land use typologies			
2.7 Adequacy of Social Tenure Domain Analysis			
2.8 Recognition of biodiversity and Critical Habitat concerns			
2.9 Policy considerations			
3. Institutional-Organizational Analysis (20%)			
3.1 Support for provincial plans			
3.2 Alignment with IP plans and programs			
3.3 Recognition of Barangay mandates and roles			
3.4 Indication of LGU commitment to develop MENRO Capacity			
3.5 Presentation and consensus: MDC			
3.6 Presentation and consensus: SB			

2 Balancing Acts: Developing Scorecards for Public Sector Excellence

2.1 Introductory Note

The scorecard operates by monitoring and measuring outputs and outcomes, and by allotting executive officers to manage assets used to deliver value to identified stakeholders. An effective scorecard design must therefore reflect the contribution of these assets by generating appropriate performance indicators.

The scorecard catalyzes discussion on current states of affairs and actions. It directs discussions on what has been achieved and what will likely be achieved in the future.

2.2 The Scorecard Model

Scorecard measures are selected to describe the organization's progress in implementing and achieving its strategy. Monitoring these measures enables management to plot the future competitive directions of the organization.

- Performance Focus: recording the achievement of the public sector organization
- Relationship Focus: recording the organizations' interface with the citizens it serves
- Activity Focus: records the internal activities of the organization
- Future Focus: similar to the learning and growth perspective and directs the public sector's thoughts to the future. This will encompass demographic issues such as the future requirement of MENROs and forest restoration and will also consider the skills needed in the future.

2.3 Performance Measures

The suggested measures must conform to the following minimum criteria to be of any real value:

- Relevance
- Attributable
- Well-defined
- Timely production of data
- Reliability
- Comparable
- Verifiable

2.4   Rationale/Context

The weak link in the life cycle of the FLUP is monitoring the implementation of what has been originally planned. To carry this out, establishing baselines and benchmarks are necessary start-up processes, that will make monitoring more focused. The case of Patnongon, Antique provides an instructive case, where application of the MORE FLUP (Managing Outcomes and Results for Enhancement) device, can provide a better understanding of how the LGU has improved its staffing, organization and systems over time. It also illustrates how strategies of Impacts, Influence and Leverage, succeeded in getting the LGU connected through the FLUP, in establishing needed economic, social and service connections primarily in forestland based communities and other important stakeholders. As a footnote, the LGU has now fully operational staff and budget, and has received recognition for being the best LGU department in two consecutive years.

2.4.1   Environmental Scanning Exercise: The PESTEL Analysis

The first essential step is to establish a priori the baseline conditions (Note: provide background information, when your FLUP was started, what external support did you receive, when was the FLUP adopted by the SB and affirmed by the DENR) when the FLUP is in the early stages of formulation. The same will be matched with a posterior assessment, using key informant interviews, focus group discussions and semi-structure interviews. The PESTEL[2] matrix below, provides six categories with which to focus the scanning process. The a priori analysis focuses more on descriptive conditions when the FLUP was still in the engaging stage, while the a posteriori, looks at the enabling conditions. This are capacity WORKS[3] parameters relating to Strategy, Process, Steering, Cooperation and Innovations.

Political	Economic	Social	Technological	Environmental	Legal
…..					
…..					
…..					

Focus Question - Political: What were the prevailing political conditions during the early stage of FLUP formulation, what was the level of awareness and sensitivity of the Local Chief Executive (LCE) and other political leaders on the issues surrounding forest and forestland management?

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[2] Political, Economic, Social, Technological, Environmental, Legal.
[3] GIZ GmbH ed. (2015) Cooperation Management for Practitioners – Managing Social Change with capacity WORKS. Springer Gabler. Wiesbaden. 281 pp.

Focus Question - Economic: What were the key and compelling economic issues faced by the LGU relative to the forestland and resource use? Was the issue of lack of tenure, understood by many?

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Focus Question - Social: What were the underlying social conditions of forest and forestland stakeholders? Where there are any avenues through which local communities are heard, discussed and decided? Describe the level of participation and representation?

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Focus Question - Technological: How did forest rehabilitation take place? What were the usual methods, species and management schemes? Where soil and water conservation measures included in the technological system? How? What was the level of success?

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Focus Question - Environmental: What were the resources that still occur in abundance? Scarce? What were the most outstanding and recurring environmental issues at the onset of your FLUP?

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Focus Question - Legal: Did you encounter legal issues, relative to regulating forest land use/enforcement? If so, how did you deal with the prosecution aspect of your legal measures. What was the level of awareness and legal appreciation of forestry/environmental laws and regulations at the LGU and community level?

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2.5 The Balanced Scorecard Quadrant

The adoption of the scorecard system allows for easier and replicable monitoring by the typically systems-constrained LGU. Inspired by the Harvard Model for the balanced scorecard, MORE FLUP, provides baselines to benchmark connections utilizing a system of quadrant objectives and measures. The assessment scores are the average taken from the Delphi Scores of the TWG. It ranges from 1 to 5: 1 undeveloped; 2 poorly developed; 3 fairly developed; 4 developed; 5 highly developed.

Figure 2 shows the balanced scorecard quadrant and their objectives and measures.

Internal View

Development Focus	Activity Focus
LEARNING and GROWTH - **Objectives and performance associated with the development of enabling culture and competencies**	**INTERNAL SERVICE PROCESSES** - **Objectives and performance measures associated with the organizations internal productive processes**
FINANCIAL - **Objectives and performance measures associated with the stakeholder's perception and expectation of the organization**	**The PUBLIC as CUSTOMER** - **Objectives and performance measures associated with the public's perception of and interaction with the organization**

External View

Figure 2: The balanced scorecard quadrant

The organization's strategy is translated into specific objectives that can be classified within each of these four perspectives. Appropriate quantitative measures are developed to report and monitor the success in achieving these objectives

Chapter 2.6 provides the scorecard related to Learning and Growth, chapter 2.7 provides the scorecard related to Internal Service Processes, chapter 2.8 provides the scorecard related to Financing the Plan and chapter 2.9 provides 6 scorecards related to the Public as a Customer.

2.6   Learning and Growth

Cultivate core competencies	Skills and Technology portfolio (e.g. GPS-GIS applications, nursery management, forest enforcement)	Scores (1-5)
Provide internal information	▪ Information availability/database management ▪ Updated watershed profiles	
Create organizational alignments	▪ Peer evaluation measures between departments ▪ Alignment of ad hoc MENRO (with MAO, MPDC, Mayor's Office, etc.)	
Develop skilled workforce	▪ Training, continuing professional education completed ▪ Workforce re-entry plans	
Maximizing productivity	▪ Output of team-staff; ▪ Level of completed staff work force	
Valuing staff	▪ Staff retention – promotion index	

2.7   Internal Service Processes

Objectives	Desired Outputs	Scores (1-5)
Harmonize planning and plan implementation	▪ Protocols/procedures initiated	
Continually develop services	▪ Nursery improvements; biodiversity assessment, forest restoration stakeholder and tenure assessment	
Rationalize decisions on land allocation for projects and investments	▪ Joint agreements or undertakings with DENR, NCIP or DAR	
Acquire staff support	▪ Hiring of contractual or permanent staff	
Creation of office and plantilla position for MENRO	▪ SB Ordinance, appointments	
Improvement of project operations and management	▪ M&E systems and feedbacking	
Linkages with private sector and CSOs	▪ Partnership Modes (PPP, any)	

2.8   Financing the Plan

Objectives	Desired Outputs	Scores (1-5)
Acquire funding appropriation for regular staff support	▪ Comprehensive investment and development plan	
Acquire 20% development funding share	▪ Annual investment plan	
Leverage for external funding support	▪ List of projects approved and implemented	
Generate revenues to support environment expenditures	▪ Financial reports (preferably expressed in ratios. e.g. revenue/ peso spent)	

2.9   The Public as Customer: Scorecard Instrument Rating

Towards the end, implementation of the FLUP should lead to achieving the essential economic, social and service connections with the public that should be served. The monitoring instrument device uses a scorecard system to allow the LGU to weigh itself against suggested norms, as expressed in Outcome Areas and Outcome Statements. For sharper focus, the monitoring device works at the community, the population and the household level.

2.9.1   Strategies of Influence: Outcome Areas and Outcome Statements

Outcome Areas	Outcome Statements	Score (1-5)
Change in public will	- Barangays motivated to take actions (on enforcement) - Barangays increases shared definition of specific problem or condition - Barangay residents increase their willingness to demonstrate around forest protection and development issues - Barangay residents change attitudes sand/or beliefs towards conservation issues	
Change in political will	- Increase awareness of natural resource management and governance issues - Increased willingness to take action on issues - legislators create ordinances and funds supporting community priorities	
Change in policies	- Increase in policy statements (CDP) that support forest governance goals (e.g. improved tenure security) - Local policy makers, down at the barangay level adopt common language in policies and regulations	

2.9.2   Strategies of Impact: Individual and Household Outcome Areas

Outcome Areas	Outcome Statements	Score (1-5)
Changes in attitudes e.g. perceptions and beliefs	- Increased view among community leaders and members that forests and forestlands are assets and hubs for local economic development - Increase desire among local residents to become engaged in conservation efforts - increased feeling of safety by residents - Young people look at the forest and forestlands, positively as Assets that can be enjoyed in the future	
Changes in knowledge	- Increased knowledge among local residents on community watershed resources - Increased knowledge of local leaders on watershed development milestones	

Changes in awareness	▪ increased awareness among barangay residents on land use history	
	▪ Increase awareness of land use, environmental laws	
Changes in skills	▪ Increased skills of agroforestry farming, production forestry	
	▪ Increased off-farm and non-farm skills	
Changes in behavior	▪ Neighbors form network of support for mutual assistance	
	▪ Barangays form network of support for mutual assistance	
Changes in resource use	▪ Increased interest in at least plot level production forestry	
	▪ Increased interest in agroforestry improvements	
Changes in management practices	▪ Increased attention to soil and water conservation measures	
	▪ Adoption of improved water resource management	
Changes in family health	▪ Families can have access to at least primary medical care	
	▪ Decrease in water-borne diseases	
Changes in financial conditions	▪ Children of families attend school across all their elementary grade	
	▪ Families maintain stable residence	
Changes in household stability	▪ Increase family income and savings	

2.9.3 Strategies of Impact: Population Level Outcome Areas and Outcome Statements

Outcome Areas	Outcome Statements	Score (1-5)
Changes in education	▪ Improved educational attainment (of target cohorts)	
Changes in social conditions	▪ Enhanced coverage of social services	
	▪ Improved representation of forest-based barangays	

Changes in economic conditions	▪ Minimum basic needs are met	
Changes in safety	▪ Crimes against life and property are reduced ▪ Higher sense of community well-being	
Changes in health and nutrition	▪ Reduced morbidity conditions	

2.9.4 Strategies of Influence (Community Level): Outcome Areas and Outcome Statements

Outcome Areas	Outcome Statements	Score (1-5)
Change in visibility of issue	▪ local media accurately cover the messages of the FLUP media campaign ▪ Media increase frequency of coverage of issue ▪ Public or community raise issues to higher priority	
Change in community norms	▪ Community decreases tolerance for poaching trees and wildlife, Kaingin, forest fire, etc. ▪ Community increases belief in its own power to create change (e.g. protection of resources) ▪ Community increases acceptance of changing demographics with changing cultural make-up	
Change in partnerships	▪ LGU DENR deepen collaborative relationships ▪ LGU, DENR and other partners jointly implement actions toward agreed upon goals articulated in the FLUP ▪ Partners improve steering function ▪ Partnership increases ability to articulate a shared purpose ▪ Partnership shares a plan of Action ▪ Partnership improves articulation of roles and responsibilities within the group ▪ Partners increase formal interagency agreements and/or collaborative protocols ▪ Partners increase referrals to one another ▪ Partners increase sharing of resources ▪ Partners increase sharing of data ▪ Partners routinely use data to evaluate efforts and refine strategies to achieve specific results	

2.9.5 Strategies of Influence (Institutional-Organizational Level): Outcome Areas and Statements

Outcome Areas	Outcome Statements	Score (1-5)
Change (reforms in regulations)	▪ Review and initiate policy reforms ▪ Increase in regulations that support a specific community goal (e.g. community watershed, forest park, etc.)	
Changes in service practices	▪ Service providers increase in technical competence ▪ MENRO Staff directly interact with key stakeholders ▪ MENRO routinely elicit consumer feedback and otherwise evaluate performance to improve effectiveness	
Changes in business practices	▪ Key (tourism) businesses are newly available in the community ▪ Business/service employees in community improve day-to-day interactions with diverse customers ▪ Business change practices to meet community and tourist preferences	

2.9.6 Strategies of Leverage: Outcome Areas and Statements

Outcome Areas	Outcome Statements	Score (1-5)
Change in LGU funds (Development funds & Admin)	▪ New public funds allocated toward community priorities	
	▪ Local funds redistributed toward community priorities	
	▪ New funding methods (pooled, matched, blended) increase monetary resources to support community priorities	
	▪ Local Government funding practices change to increase availability of funds for community priorities	
Change in fund sourcing/ philanthropy	▪ Increase funding available for environment and community priorities	
	▪ New funding methods (pooled, matched, blended) increase monetary resources to support community priorities	
	▪ Foundations funding practices changes to increase availability of funds for community priorities	
	▪ Foundations make new types of funding available	
	▪ Foundations previously uninvolved in community begin to provide funding for community programs, agencies and initiatives	
Changes in resources available to the community	▪ New physical resources are available (e.g. for land development)	
	▪ New Service resources are available to the community	
Changes in private investments	▪ Investments in forest management related enterprises take place	
	▪ Nature/ecotourism-related investments increase	

3 FLUP to CLUP: Suggested Protocol for Integration

3.1 Context

Seamless integration, is what has been envisaged as the desired norm for blending the FLUP into the CLUP document, following the enhanced guidelines. The programmatic 7-step FLUP procedure dovetails with the 12 step CLUP process (Fig. 3), along four major lines of action.

3.1.1 CLUP Ecosystems Analysis

The stepwise procedure in the enhanced CLUP is outlined below, corresponding to the key steps in the FLUP process:

1. Data gathering, mapping and validation
2. Situational analysis
3. Forests and forestlands management zoning
4. Strategic direction and investment planning

The seeming lack of congruence between the FLUP process and the enhanced CLUP is remedied by identifying activity categories, where each find common ground such as in data gathering, mapping and validation and situational analysis.
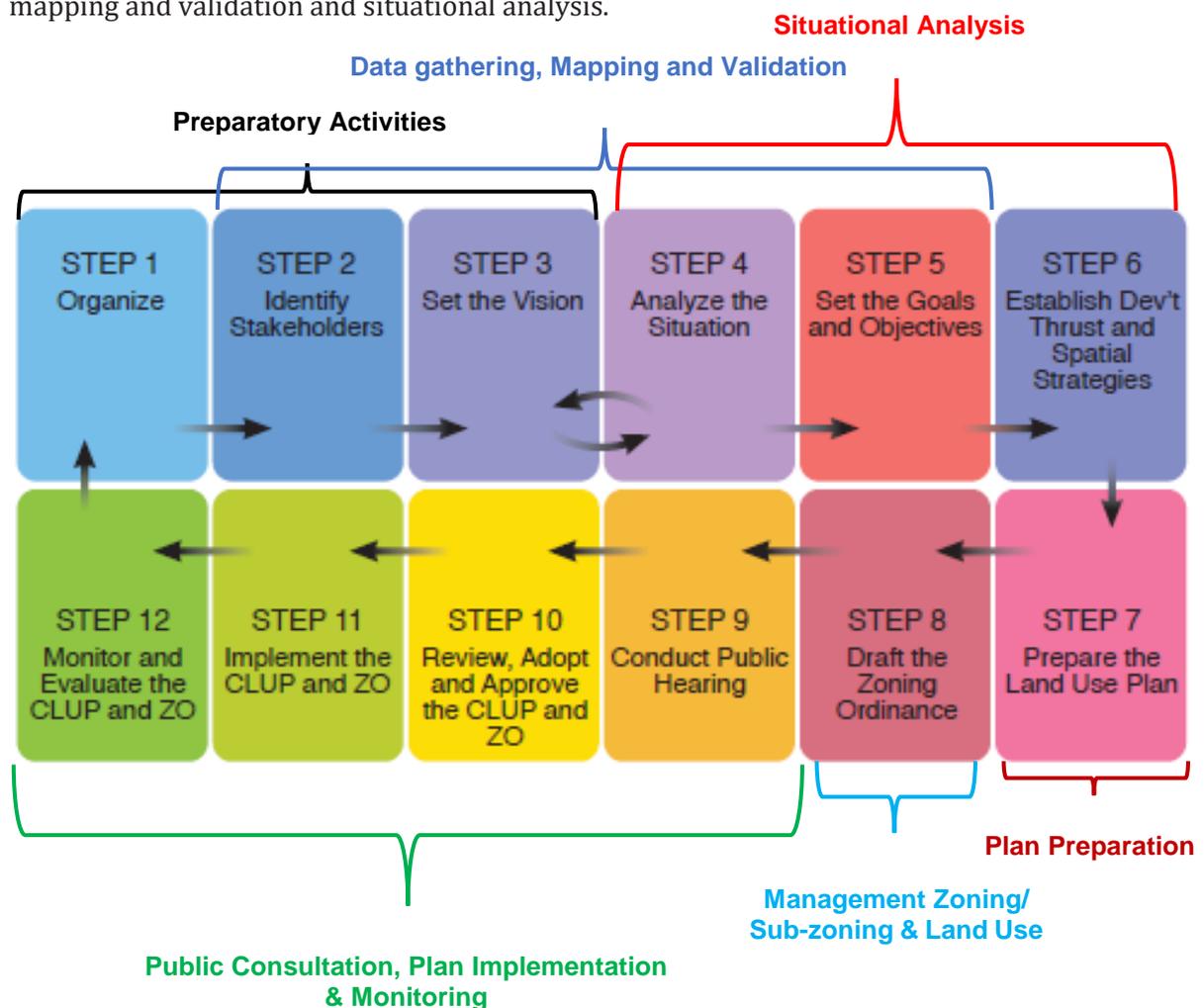

Figure 3: Mainstreaming Forest Ecosystem into the CLUP Process

The coherence between the FLUP and the CLUP process is the **adoption of the Watershed Ecosystem as the main planning framework** (from ridge to reef). The functional and relational character of land use is better understood when seen in the context of the watersheds, where the LGUs jurisdiction is located.

There are instances, where two or more LGUs are spatially connected within the same watershed. This places them in a challenging condition to move away from the usual and parochial boundary disputes. During step 3 of the CLUP process (Fig. 3) each LGU can develop indicative municipal priorities, following the visioning exercise which already consider the watershed approach and inter-LGU coordination and cooperation. During steps 4 and 6 of the CLUP process (Fig. 3) each LGU can independently analyze its relationship with the similarly-situated neighboring LGU(s) and proactively plan for constructive engagement, particularly where biodiversity corridors are recognized and established. Step 4 looks at the effects or impacts of the LGU on adjacent LGU(s) while step 6 looks into options for inter-LGU coordination and cooperation as well as other sectoral plans (e.g. FEA, BDV, CCA, DRM and CRMP). In moving to the formulation of spatial strategies, the FLUP and other sectoral plans already are brought into the picture.

3.2   FLUP to CLUP Integration Matrix Scorecard

The assessment score applies to the FLUP's correspondence with the CLUP process. It collectively looks at both Key Findings (column 2) and Methods (column 3) as Forest Ecosystem Analytical Attributes, for both content and process. The score ranges from 1-5, with 1 = highly inadequate, 2 = inadequate, 3 = fairly adequate, 4 = adequate and 5 = highly adequate.

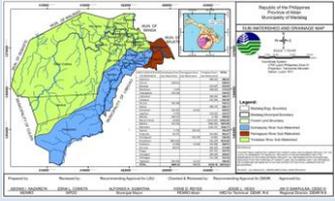| Focal Area of Analysis	Key Findings: Extent-Magnitude-Importance-Special Sensitivity (EMIS) 4-way Test	Methods and link with CLUP	Score (1-5)
1. Forest landscape resource assessment	Situation of the standing forest relative to the total Forestland and municipal landscape	Field observation	
		Inventory results, if available	
	Drivers and trends of forest decline/increase	Use of thematic map and other studies	
	Vegetation cover types (in 2 time periods) vegetation cover maps	Map overlay and analysis	
	Other land uses/pattern of forestland use	PRA (e.g. community mapping)	

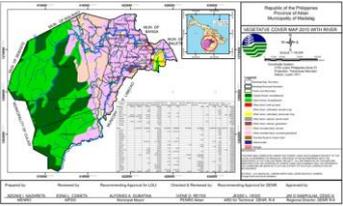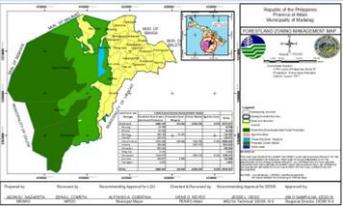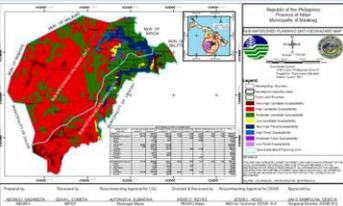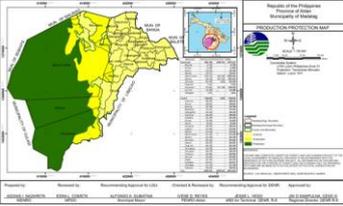|			
2. Assessing existing forest landscape management regime	*De Jure* and *De Facto* management - who manages the forestland?	Participatory Resource Appraisal (PRA)	
	Stakeholders' contribution to forest development and management; capability index	Stakeholder profiling	
	Legitimate entities tasked to undertake FFL protection and development?	Stakeholder analysis	
	Presence of indigenous peoples and status?	Tenure holders assessment	
	Untenured migrants	Social tenure domain analysis	
	Other ownership rights (mining, CADT, other claimants)	IP integrity check with NCIP	
3. Population pressure	Population within the forestland estate and associated practices (Kaingin, illegal cutting, unregulated resource extraction)	RRA (Rapid Resource Appraisal)	
	Key economic activities of people	Socio-economic profiling, review of sectoral studies	
	Economic standing of settlers (within or below poverty thresholds)	Analysis of direct stakeholder contributions to local economy	
4. Other economic activities in the forestland	Conflict lines (involving in situ and ex situ forestland uses)? Status of conflicts	Conflict analysis/socio-profiling	
5. Biodiversity status in forestland	Important species of plants and animals and their habitat	RRA	
		Biodiversity inventory/ studies	
		Participatory mapping	
		Critical habitat assessment	
6. Climate change vulnerability	Vulnerability level of forest ecosystem based on combined findings on exposure, sensitivity, adaptive capacity; key variables recommended: erosion, forest fire, landslide, drought	Vulnerability assessment	
		Map overlay and analysis	
		Socio profiling	

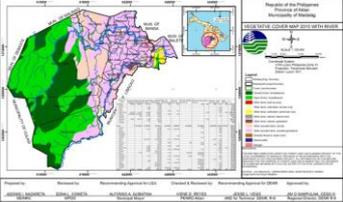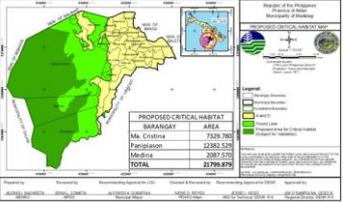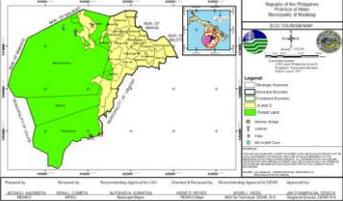## 3.3 FLUP@CLUP Mapping Protocols: Map Overlay Analysis and Convergences

The FLUP's situational analysis is envisaged to provide a rational basis for responding to the following key questions:

- Which subwatersheds are servicing the largest A&D area that could potentially increase agricultural production?

- Which subwatersheds contain and therefore, are protecting the key infrastructures such as irrigation systems, roads, bridges, domestic water systems, etc.?

- Which watersheds have dense settlements and populations?

- Which watersheds urgently need rehabilitation and protection to minimize anticipated destruction in A&D areas, infrastructures and settlements"

- Which watersheds have the most forest cover that will need immediate protection and management?

To initiate the map overlay and convergence process, the base maps to be used are the Land Classification (LC) and the Watershed and Drainage (WD) maps. The stepwise progression of map overlays, as illustrated below for Madalag, shows derivations of maps that form convergences and correspondingly indicate key integration points into the CLUP Process.

Objective	Overlaid maps and derived maps (D1-8)	Results and Convergences	Key Integration Points (first indicative map)
1. Determine watersheds in forest lands and A&D	**LC + WD = D1**	D1 shows the different watersheds/drainage systems that are found in forest lands and A&D lands. The location and coverage of these watersheds and the relative area of the forestlands and A&D per watershed. WFLAD (Watershed-Forestland-Ancestral Domain) also shows the relative size of the A&D as the service area of the forestlands under each watershed.	Watershed and Drainage; political boundary (municipal and barangay); general land classification (Forest land and built-up area) plus Coastal Zone area plus municipal waters.

2. Determine the vegetation cover in each delineated forestland	**D1 +VC = D2** 	D2 shows the vegetation cover (VC) of each watershed in the forestlands. The location, extent, area and percentages of each vegetation or cover are determined.	Will appear in CLUP's ecosystem analysis.
3. Determine the allocation of forestlands in each watershed under various vegetation cover	**D2 + Te = D3** Te: tenure for forestland with vegetation cover	D3 shows the location, size, and vegetation/land use of allocated and "unallocated" portions of forestlands in each watershed.	Will appear in CLUP's ecosystem analysis.
4. Determine the infrastructures, protection areas, and service areas affected by each watershed	**D1 + Inf + S + E = D4** D1: Watershed & Drainage Inf: infrastructure S: slope E: elevation	D4 highlights the watersheds and the infrastructures, protection areas, A&D areas that they support or service. The convergences show the off-site infrastructure and the service areas of the watersheds. The ensuing analysis also shows which watershed area has the largest or biggest impact area. Comparative accessibility of the watersheds is also ranked or categorized.	Plus, protected areas, IP areas.
5. Determine the size and location of communities with respect to the watersheds and forestland resources	**SeBa + D4 + D2 = D5** SeBa: settlement at barangay level	D5 shows the location and accessibility of communities with respect vegetation, allocated forest land, unallocated area under each watershed. It shows how much of the area within the watershed is not yet allocated and the location of communities with respect to permanently	Will appear in the social sector of the CLUP as well as in ecosystem analysis.

		allocated forest lands such as protected areas, reservations and CADTs. This derived map directly highlight forestlands in each watershed which need immediate allocation, effective management and sustainable use or development.	
6. Determine the protection and production forest lands	**D2 + S + Ha + E = D6** Ha: hazard	D6 categorizes the forestlands which need protection strategies and those that maybe devoted to production activities such as intensive forest management, plantation development, agroforestry, and other combination of high value plantation crops and forest species. The forest protection lands are those in areas on slope above 50% elevation above 1,000 masl, old growth and mossy forests and hazard areas.	Will appear in ecosystem analysis.
7. Determine the critical habitat area	**D6 + BDV = D7** BDV: biodiversity	D7 categories both PFA and FPA, with high conservation values for biodiversity.	Will appear as overlay Zone.
8. Determine areas of ecotourism potential	**D7 + D6 = D8** 	D8 categorizes the ecotourism sites both with the protection and production aspect of the forest landscape.	Will appear in the economic sector analysis.

Note: At the indicative level, include Geo-hazard Map (landslide, erosion, flooding, storm surge, tsunami).