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<p>Title:</p> <p>Author:</p> <p>Adviser:</p> <p>Co-adviser:</p> <p>Program:</p> <p>Year:</p>	<p>Biomass and carbon sequestration prediction models for Acacia mangium Willd plantation in Tain Nguyen Province, Viet Nam Tulod, Adrian</p> <p>Nguyen, Hung Tuan</p> <p>Villanueva, Teodoro R. Carandang, Wilfredo M.; Pulhin, Juan M.; Carandang, Myra G.</p> <p>Doctor of Philosophy with Specialization in Forestry: Forest Resources Management</p> <p>2018</p>
<p>Abstract/Executive Summary:</p>	<p>The study developed a model to estimate current biomass and carbon stocks as well as predict future biomass and carbon sequestration potential for forest plantations of Acacia mangium Willd in Thai Nguyen Province, Vietnam. Specifically, the study: 1) characterized the Acacia mangium Willd plantation in Thai Nguyen Province, Vietnam 2) estimated the current biomass and carbon stocks of tree and stand for Acacia mangium Willd plantations 3) developed a biomass and carbon models for tree of Acacia mangium Willd 4) determined the future conditions of plantation based on the programs and policies of the government and 5) recommended appropriate management strategies to improve the forest plantation development and management. A total of 126 plots representing various ages of plantations were established at the bottom, hillside, and hilltop of the plantation. Data collected from each plot included age of plantation, spacing, density, diameter, total height, basal area, and volume. Estimates of the various plantation characteristics showed significantly higher values in the bottom compared with those in the other parts of the plantations sampled. The data for biomass and carbon estimation and development of prediction models came from 54 destructive sampled trees of different diameter classes (big, medium, and small) of the different ages. Six candidate non-linear regression equations using variables as diameter, total height, and age of plantation were tested and assessed for statistical validity and accuracy in biomass and carbon prediction. Data analysis was carried out in Excel and STATA 14 PM software. The</p>



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	<p>study showed that the major biomass and carbon of trees are boles, followed by branches and leaves. Biomass and carbon models were tested for separated ages (each age class was tested by the model), as well as all age levels from ages 2 to 7 Acacia mangium Willd plantation (all age classes from 2 to 7 were tested by the model). In terms of separated ages, the model with one variable as diameter (D) showed better values than variable height (H) and two variables (D, H) combined due to the high correlation efficiency (R'), small standard error (SE), and higher F values. As for the models tested for all age levels combined with the addition of the variable age (A), there was no significant difference observed between single predictor and combined predictors. The accuracy of the values was tested by chi-square and residual analysis to compare between observed and predicted biomass and carbon. The prediction equations were used to assess future biomass and carbon sequestration in the province. Scenarios of biomass and carbon change were assessed based on the programs and policy of the government.</p>
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	<p>Title: Sustainability of arabica coffee (<i>Coffea arabica</i> L.) -based agroforestry system in Atok, Benguet Province, Philippines</p> <p>Author: Bao-Idang, Conrado</p> <p>Adviser: Visco, Roberto G.</p> <p>Program: Doctor of Philosophy with Specialization in Forestry: Silviculture and Forest Influences</p> <p>Year: 2015</p>
<p>Abstract/Executive Summary:</p>	<p>The study assesses the sustainability of the Arabica coffee-based agroforestry systems in Atok, Benguet, Philippines. Specifically, it aimed to: a) determine the ecological and socio-economic factors, and cultural plantation practices that affect the Arabica coffee-based agroforestry systems and b) to analyze the sustainability of Arabica coffee-based agroforestry systems using the socio-economic, ecological and cultural plantation practices or sustainability indication. The study was established in a split-split plot design with two elevation ranges as main plots, two nurse trees as subplots, and three coffee age ranges as sub-subplots. Interview and ocular survey were also included to obtain data on socio-economic and cultural plantation practices of farmers. The sustainability indicators and corresponding sub-indicators under each were given a corresponding value weight and rated based on established threshold level and using likert scale. The ecological factors considered are temperature, rainfall, biodiversity, litterfall production and NPK contents, decomposition rate, soil properties (N,P,K, OM, pH and BD), and sheet erosion rate. These factors were assessed as moderately to highly sustainable with an overall rating of moderately sustainable and average weighted means (AWM) of 2.28. Socio-economic sustainability based on respondents' economic factors: gross income, coffee farm net income, coffee farm initial investment, coffee yield, coffee buyers, management risks and external support services was rated and social factors: Respondents' quality of life, membership in organizations, and peace and order situation of the community was rated moderately sustainable with AWM of 2.17. The respondents Arabica coffee silvicultural practices also obtained an overall moderately sustainable based on combined ecological and socio-economic characteristics, and silvicultural practices with an overall AWM of 2.29. Promotion of the coffee-based agroforestry system for expansion, and sustained external support and further studies to improve its sustainability are strongly recommended.</p>

	<p>Title: Effects of pruning, thinning and intercropping on the biomass, yield and soil properties of jatropha (<i>Jatropha curcas</i> L.) based agroforestry system</p> <p>Author: Totaan, Darwin Elizaga</p> <p>Adviser: Castillo, Arturo, SA</p> <p>Program: Doctor of Philosophy with Specialization in Forestry: Silviculture and Forest Influences</p> <p>Year: 2011</p>
<p>Abstract/Executive Summary:</p>	<p>This study aimed to evaluate the effects of pruning, thinning and intercropping on the biomass, yield and soil properties of Jatropha-based agroforestry system. The study made use of Randomized Complete Block Design with the following treatments: JCI-pure agronomic crop (bush sitao/corn) JC2-pure Jatropha (with no pruning and thinning on Jatropha JC5-application of pruning with intercropping on Jatropha and JC6-application of pruning and thinning with intercropping on Jatropha. The findings revealed that the average number of branches, diameter of branch and basal diameter of a three-year-old Jatropha were significantly increased with the application of pruning, thinning and intercropping (JC6) having 25,75.28 mm and 136.39mm, respectively. However, no significant result was observed on the length of Jatropha applied with various cultural practices. On per plant basis, yield components of Jatropha increased significantly with the applications of the treatment JC6 particularly on the total number and weight of fruit having 59 and 0.608 kg plant⁻¹, respectively. Furthermore, seed yield was improved with 0.160kg plant⁻¹. However, JC6 was lower in terms of seed yield with 199.40 kg ha⁻¹ compared to JC5 with 280.42 kg ha⁻¹. The decrease of seed yield in JC6 was attributed to the reduction of plant density due to the application of thinning. The above-ground biomass, dry matter yield and number of pod of bush sitao did not reveal any significant results except for the pod yield wherein JC6 obtained the highest yield on per plant basis with 0.146 kg plant⁻¹. No significant result was observed on the above-ground biomass and corn ear yield in all the cultural practices applied on per plant analysis. Nevertheless, above-ground biomass, dry matter yield, ear yield of corn was comparatively higher in monocropping than intercropping. Nutrient contents of Jatropha were not affected by the cultural practices. On the other hand a significant increase in calcium and magnesium contents of bush sitao during the dry cropping as well as for the potassium content of corn during the wet cropping. The applied cultural practices have no significant effect on the depth and amount of soil erosion at each portion of the 15% slope study site (downslope, midslope and upslope). The different cultural practices did not cause significant effect on the temporal variation of soil fertility status of the area during the dry and wet cropping seasons. In terms of the profitability analysis on the cultural practices, JC6 obtained the highest positive annual net income (P333, 769.13), the return of investment (315.86%) and benefit-cost ratio (3.159).</p>

	<p>Title: Supply and demand models for falcata (<i>Paraserianthes falcataria</i> L. Nielsen) and yemane (<i>Gmelina arborea</i> Roxb.) sawlogs in Caraga and Cagayan Valley Regions, Philippines</p> <p>Author: Cortiguerra, Emelynne Cuaresma</p> <p>Adviser: Cruz, Cerenilla A.</p> <p>Program: Doctor of Philosophy with Specialization in Forestry: Forest Resource Management</p> <p>Year: 2011</p>
<p>Abstract/Executive Summary:</p>	<p>This study was undertaken to develop supply and demand models for falcata and yemane sawlogs in Caraga and Cagayan Valley Regions. Specifically, the study aimed to: (1) describe the sawlog production systems for falcata and yemane sawlogs in Caraga and Cagayan Valley Regions (2) identify factors affecting demand for and supply and yemane sawlogs in Caraga and Cagayan Valley Regions (3) determine demand and supply elasticities of the two species in the Caraga and Cagayan Valley Regions and (4) compare the supply and demand models for falcata and yemane sawlogs in Caraga and Cagayan Valley Regions. Cross-section data were used in the model construction. Five structural equations were developed: (1) supply of falcata sawlog in Caraga Region (2) demand for falcata sawlog in Caraga Region (3) supply of yemane sawlog in Caraga Region and (4) supply of yemane sawlog in Cagayan Valley Region and (5) demand for yemane sawlog in Cagayan Valley Region. In Caraga Region, the supply of falcata sawlogs was influenced by investment cost (INVEST), price of falcata pulpwood lagged one year (PFPW-1), price of falcata sawlog lagged one year (PFSW-1), the price of labor (Plabor), and profit margin (PM). Meanwhile, the demand for falcata sawlog was influenced by plant capacity (CAP), price of falcata sawlogs (PFL), and the price of labor (Plabor). Equilibrium quantity for falcata sawlogs is 422.058 cu m per year and equilibrium price is P2, 870.50 per cum. Supply of yemane sawlogs in Caraga Region was influenced by the price of Yemane sawlogs lagged one year (PYSW-1), price of yemane pulpwood current year (PYPW), and cost of delivery (CDEL). On the other hand, supply of yemane sawlogs in Cagayan Valley Region was influenced by investment cost (INV) and loans (LOAN). The degree of responsiveness of supply/demand to its factors was measured using elasticity. Comparison of falcata sawlog and supply of yemane sawlogs in Caraga Region was done with both models being influenced by price of sawlogs lagged one year. PFSW-1 negatively influenced the supply of falcata sawlogs while PYSW-1 positively influenced the supply of yemane sawlogs. The regression of PFSW-1 was not significantly different from zero. On the other hand, PYSW-1 is significantly different from zero. Likewise, a comparison on demand for falcata sawlogs in Caraga Region and demand for yemane sawlogs in Cagayan Valley was done; however, there were no common variables as point comparison.</p>

	<p>Title: A management system for watersheds dominated by spiked pepper (<i>Piper aduncum</i> L.) in Southern Mindanao, Philippines</p> <p>Author: Cardente, Thomas Labra , II</p> <p>Adviser: Villanueva, Teodoro R.</p> <p>Program: Doctor of Philosophy with Specialization in Forestry: Forest Resource Management</p> <p>Year: 2011</p>
<p>Abstract/Executive Summary:</p>	<p>This study explored ways of harnessing the potentials of the spiked pepper tree (<i>Piper aduncum</i>) for the management of watersheds where it has proliferated. With Upper Buayan Watershed in Sarangani Province as study area, the methods employed were: (1) biophysical characterization using GIS, (2) determination of farmers' knowledge and perceptions on spiked pepper, (3) carbon stock assessment, (4) determination of soil chemical properties, (5) floral diversity assessment, (6) economic valuation of spiked pepper, and (7) cost-benefit analysis. Spiked pepper was found to have many ecological and economic benefits, far outweighing its supposed disadvantages as a species considered to be bio-invasive. Aside from its acceptability among farmers, it was found to have strong potentials for carbon sequestration, for improving soil nutrients after a short period, and for livelihood generation when its poles are sold as firewood or as tomato and asparagus pegs. Biodiversity-wise, spiked pepper stands to nurture a big number of endemic wildlings. Its bright prospects also came out for improving the cover of hilly lands susceptible to erosion during rains and to wildfires during dry months suppressing cogon and other weeds in grasslands and shortening the fallow period of upland cropping systems. Cost-benefit analysis of ten management system options arrived at, revealed that the most profitable is Agroforestry (NPV=Php33.8 trillion), followed by Rubber Plantation (Php 270.56 million). The least profitable is Grazing (NPV=Php 6 million). Spiked pepper's robust growth performance in grasslands and marginal areas makes it a highly potent species for restoration of denuded uplands, rehabilitation of erosion-impacted watershed, provision of alternative livelihood for upland dwellers, and deflecting small-wood gatherers that would otherwise turn to natural forest and to more valuable indigenous species. Its use can serve to propel the National Greening Program and help the country face its rural poverty, food security, and climate change problems. Gray areas in the other economic and ecological potentials of spiked pepper still exist. Thus, a number of recommendations are made to fill research gaps, address policy requirements, and fine-tune management systems.</p>

<p>Title:</p> <p>Author:</p> <p>Adviser:</p> <p>Program:</p> <p>Year:</p>	<p>Assessment of seed distribution, dissemination and diffusion pathways of priority tree plantation species in the Philippines</p> <p>Siladan, Marcelino U.</p> <p>Tolentino, Enriques L., Jr.</p> <p>Doctor of Philosophy with Specialization in Forestry: Silviculture and Forest Influences</p> <p>2010</p>
<p>Abstract/Executive Summary:</p>	<p>The study was conducted to understand and document the state of the country's seeds sources, the origins of the priority forest tree seeds, the systems of seed distribution, dissemination and diffusion of priority tree plantation in the Philippines. It also tried to characterize and analyze the major forest tree seed sources, seed producers and dealers of priority plantation species and their system of seed collection/acquisition system, processing, handling, storage and distribution practices. In the process, the seed quality and quantity supplied by the seeds sources were evaluated as well as the phenotypic characteristics of the seed trees where the seeds were collected. Based on the results, a modification of the guideline for plus tree selection was proposed. Data were collected using document reviews, field surveys and interviews. The study also revealed that a considerable number of seed sources surveyed are distributed in the three major islands of the country, located mostly in Mindanao. While there are seed sources that are easy to access, a limited number can be considered phenotypically good quality due to absence of roguing. The study also revealed 5 major categories of the tree seed producers, distributors and suppliers' and four (4) major seed pathway linkages from the origins and primary seeds sources to the various end-users. Likewise, the study also revealed five industrial tree plantation (ITP) species with the most number of seed sources surveyed, namely: yemane (<i>Gmelina arborea</i> Roxb.) mahogany (<i>Swietenia macrophylla</i> King) mangium (<i>Acacia mangium</i> Willd.) bagras (<i>Eucalyptus deglupta</i> Blume.) and narra (<i>Pterocarpus indicus</i> Willd.). The origins and movement pathways of seeds of these species provided to be difficult to trace due to poor documentation or complete absence of records of trees planted many years ago. Evaluation done on the seed trees of seeds stands revealed a mixture of straight, semi-straight and crooked trees. Pollen from bad trees continues to contaminate the good trees thus seed collected from the plus trees are not 100% of good phenotype. On this basis, a revision to the existing plus trees selection guideline is put forward. Results of the seed collection, processing and storage and testing practices of the seed sources revealed the need of improvements in the area of tools and equipment, which affects seed quality. Results and recommendations of the study will serve as among the basis for addressing concerns on seed quality to support forestation and future tree improvement initiatives in the country.</p>

	<p>Title: Participatory land use allocation in Besitang Watershed, Langkat, North Sumatra, Indonesia</p> <p>Author: Rahmawaty</p> <p>Adviser: Villanueva Teodoro, R.</p> <p>Program: Doctor of Philosophy with Specialization in Forestry: Forest Resource Management</p> <p>Year: 2009</p>
<p>Abstract/Executive Summary:</p>	<p>This study was conducted to develop a framework for participatory and improved land use decision-making in Besitang Watershed, Langkat, North Sumatra, Indonesia. Specifically, it aimed to: assess land use changes, estimate soil erosion under different land uses, analyze the actual and potential suitability of the lands for several annual, estate and silvicultural crops, and determine the current and potential land use suitability with stakeholder participation, and develop a spatial participatory land use allocation based on integrated approach to ensure sustainability. Socio-economic information and physical data were derived from interviews and field surveys. Collective opinion was derived from the workshop with stakeholders. Geographic Information System (GIS) and Analytical Hierarchy Process (AHP) were used for land use allocation. The Universal Soil Loss Equation (USLE) was used to determine soil erosion in each land system. Remarkable land use changes occurred from 1990 to 2006. Large portions of primary forest (82%) were converted to secondary forest, followed by conversion of mangrove forest into fish pond (30%). The mean soil erosion is classified as Class 2 and large areas are under suitable land uses based on erosion index. Land capability of Besitang Watershed ranges from Class II to VI. The majority of land is under the land capability Class III. Land systems with very steep slopes were not suitable for several annual and estate crops and silvicultural species. In general both annual and estate crops as well as silvicultural species are not suitable (N) in the lower stream of the watershed, due to drainage and flooding hazard. Alternative for Forestry in Besitang Watershed based on integrated approach has very high suitability (63%). Agriculture use has high (63%) to very high (37%) suitability. Settlement Area has low (23%) to moderate (77%) suitability. Fishery use has low (47%), moderate (18%), and high (35%) suitability. Industry has very low suitability in all decision zones (100%). Based on allocation for multiple-use Besitang Watershed has very high potential suitability for forestry (63%) and agriculture (37%) land uses. The most significant contributions of integrated approach using GIS and AHP in facilitating land use decision-making were: as a tool for land use allocation and policy formulation, as well as for scientific investigations. This approach provides participatory involvement of stakeholders in land use allocation. This approach is efficient and reliable land use allocation for watershed management since it involves the physical components as well as participation of stakeholders to ensure sustainability.</p>

	<p>Title: A GIS-based forest resources management system for Gibbon protected area in Trung Khanh Nature Reserve, Cao Bang Province, Vietnam</p> <p>Author: Tran, Quo Hung</p> <p>Adviser: Racelis, Diomedes A.</p> <p>Program: Doctor of Philosophy with Specialization in Forestry: Forest Resource Management</p> <p>Year: 2008</p>
<p>Abstract/Executive Summary:</p>	<p>This study was conducted to develop a GIS-based forest resource management system for the Gibbon Protected Area in Trung Khanh District, Cao Bang Province, Vietnam. The study gathered primary vegetation data from 34 sample plots in the Cao Vit Gibbon Protected Area. Primary socio-economic data are also gathered through interviews with 74 households of the nearby villages. SPSS Regression is used to analyze the correlation between socio-economic factors and Gibbon habitat. GAME model is used to develop a database system of forest resource management in the study area using ArcView software. Analysis shows that there are a total of 131 trees, shrub, vine and herb species from 59 families found in the research area. Floristic composition analysis shows that the research area is dominated by some species such as <i>Cephalomappa sinensis</i>, <i>Dendrocnide urentissima</i>, <i>Radermachera sinica</i>, <i>Acer tonkinensis</i> Lecomte, and <i>Excentro dendron hsienmu</i>. This study shows that local people rely on agricultural production, animal husbandry, forest products, gardening, fishery and wage labor for their income. Forest products rank third as main source of income in the nearby villages. However, firewood collection, timber cutting and livestock grazing pose a big threat to Cao Vit Gibbon Protected Area. This is also reflected and affirmed through the correlation analysis. The study site has a generally steep topography with an elevation range of 500 - 1000msl and interrupted by lowland depressions. The analysis shows that human activities are mostly carried out in areas near the villages, at lower altitude, and less steep slopes where accessibility is much easier. Databases for forest resource management system are created through the GAME Model. The area and location of the suitable gibbon habitat are identified by GPA - FRMS. The study confirms that limited habitat and degraded vegetation, especially food plant species for gibbon, are reasons for a larger number of Cao Vit gibbon in group (5 - 7 individuals). The potential Gibbon habitat is also assessed by using the GPA - FRMS, and own assumption in lieu of very few studies on gibbons. The study is really useful not only for forest resources management in the Gibbon Protected Area but also for other protected areas in Vietnam.</p>

<p>Title:</p> <p>Author:</p> <p>Adviser:</p> <p>Program:</p> <p>Year:</p> <p>Abstract/Executive Summary:</p>	<p>Survival and growth responses of three tree species to mycorrhiza and fertilizers in the bioremediation of a mine waste dump</p> <p>Parao, Marissa Reyes</p> <p>dela Cruz, Loretto U.</p> <p>Doctor of Philosophy with Specialization in Forestry: Silviculture and Forest Influences</p> <p>2008</p> <p>The sub-marginal condition and the cost of rehabilitation deter most of the mine spoil rehabilitation efforts. As an alternative, bioremediation has been resorted to. This study evaluated the potentials of mycorrhiza, fertilizers and the use of tolerant species in the bioremediation of a mine waste dump of Antamok, Itogon, Benguet. Seedlings of <i>Casuarina equisetifolia</i> Forst., <i>Alnus maritima</i> Marsh Nutt. and <i>Eucalyptus camaldulensis</i> Dehn. were raised in the nursery and subjected to mycorrhizal inoculation treatments. These seedlings were planted in the mine spoil and were further subjected to four fertilizer treatments: 120g compost, 0g NPK, 5g NPK and 20g NPK. Two months after treatment application, height and diameter increments were measured every month. Other parameters measured include survival, biomass, N,P,K, Cd, Cr, Mn, and Fe uptake eight months after field planting. Results showed that, except for <i>Alnus</i>, seedlings planted in mine spoil responded positively to mycorrhiza. Likewise, <i>Agoho</i> and <i>eucalyptus</i> responded positively to application of 20g NPK. Both nutrient uptake and heavy metal uptake indicate the positive role of mycorrhiza and fertilizers in increasing plant tolerance to nutritional imbalance and heavy metal toxicity.</p>
<p>Title:</p> <p>Author:</p> <p>Adviser:</p> <p>Program:</p> <p>Year:</p> <p>Abstract/Executive Summary:</p>	<p>Root growth potential and early field performance of <i>Gmelina arborea</i> intercropped with <i>Zea mays</i></p> <p>Corpuz, Onofre S.</p> <p>Carandang, Wilfredo M.</p> <p>Doctor of Philosophy with Specialization in Forestry: Silviculture and Forest Influences</p> <p>2008</p> <p>Three continuous studies were undertaken to characterize root growth potential (RGP) of <i>Gmelina arborea</i> based on provenance and to evaluate RGP's suitability as a measure of seedling quality through field trials as affected by distance of planting and provenance. Carbon storage of the farming system was estimated through field measurements. The nursery experiment showed significant variations in all morphological characteristics of</p>

	<p>seedlings of Gmelina by provenance. Seeds from Candelaria, Quezon and Kabacan, Cotabato were significantly different in all morphological traits measured compared with the seeds from Davao del Sur, and Arakan, Cotabato. The RGP in terms of first order lateral roots (FOLR) was found to be positively correlated with root collar diameter, primary root length, stem height, and rootshoot ratio. The frequency distribution of FOLR on the other hand was found to be normally distributed. Seedlings with 18 FOLR counted the most from a range of 3 to 35. There were three natural FOLR groupings established: R1 (0-10) R2 (11-20) and R3 (21-30+). The field trials revealed significant differences in the growth of Gmelina after one year. Strong genetic control over height, basal area, and biomass were observed. Seeds from Quezon were significantly different in terms of merchantable and total heights compared to those from Cotabato and Davao del Sur. While in terms of basal area and biomass, Quezon and Cotabato seeds did not differ significantly. On the other hand, the three provenance did not vary significantly in terms of DBH, tree volume and survival. Distance of planting also significantly affects height, diameter growth and survival of the tree. However, basal area, tree volume and biomass varied significantly. Root classes affected tree diameter, total height, percent survival, and volume significantly. All factors did not show any significant variation on basal area, and merchantable height. Root classes were found to be positively and significantly correlated with DBH, basal area, and root biomass. The performance of the intercropped Zea may vary significantly in all agronomic and morphological characters as affected by tree spacing but not by RGP classes. The monocropped corn significantly performed better in all traits compared to those interplanted with the Gmelina.</p>
<p>Abstract/Executive Summary:</p>	<p>Title: Multiple-use tradeoffs in Kaliwa Watershed, Luzon, Philippines</p> <p>Author: Tomas, Wilma Gaor</p> <p>Adviser: Carandang, Myrna G.</p> <p>Program: Doctor of Philosophy with Specialization in Forestry: Forest Resource Management</p> <p>Year: 2006</p> <p>The constraint method of the multiobjective linear programming (MOLP) Model used to allocate four production land uses that would maximize yield. The production land uses were agriculture, agroforestry, pasture, and fuelwood. The noninferior set estimation (NISE) algorithm in a MOLP Model determined the tradeoffs between the pasture and multi storey agroforestry. The selected tradeoff solutions in brushland and grassland increased the yield of multi storey agroforestry to 90 tons at the expense of 38 a.u. livestock. Likewise, the area of the multistorey agroforestry increased from 31.6 ha to 108.8 ha, while that of a pasture decreased from 325.9 ha to 248.7 ha. A total area of 26,863.8 ha</p>

	<p>was allocated to different land uses in the watershed. The natural/permanent and protection forests covered 63 (17,435.5 ha) of the total watershed area while the production land uses had a total area of 639.9 ha. The results of the study indicate that MOLP is an effective tool in making decisions. Although it allocated only a small portion of brushland and grassland to agriculture, agroforestry, pasture, and fuelwood land uses, these are already sufficient to satisfy the demand of the existing population within the watershed. The NISE algorithm, on the other hand, provided explicit tradeoffs between the pasture and multistorey agroforestry. The method encourages more flexible planning because it generated a range of possible solutions, which the watershed users could choose.</p>
<p>Abstract/Executive Summary:</p>	<p>Title: Bagras (Eucalyptus deglupta Blume) and maize (Zea mays L.) above ground interactions in alley cropping system at Claveria, Misamis Oriental, Mindanao, Philippines</p> <p>Author: Abas, Esmael Lidasan</p> <p>Adviser: Visco, Roberto G.</p> <p>Program: Doctor of Philosophy with Specialization in Forestry: Silviculture and Forest Influences</p> <p>Year: 2006</p> <p>The study was conducted to examine the above-ground interactions of 7-year old bagras (<i>Eucalyptus deglupta</i> Blume) and maize (<i>Zea mays</i> L.) in an alley cropping system. A randomized complete block design (RCBD) was followed replicated twice. The experimental treatments include a sole maize control and as intercrop under 1x3m and 1x9m hedgerow spacing. The results showed that height and diameter breast height (DBH) increment of bagras were not significantly different in the 9 m and 3 m hedgerow spacing. Trees under 9m spacing had wider canopy extension although the relative canopy density (RCD) was lower. Canopy openness was not significantly different between the two hedgerow treatments. Photosynthetically active radiation (PAR) availability was significantly lower under the hedgerow treatments compared to the control. Moreover, the hedgerow alley was observed to have consistently lower PAR near the hedges compared to the center of the alley. Maize agronomic performance (height, number of leaves, leaf area(LA), leaf area index (LAI), dry biomass, and grain yield) across cropping season was consistently lower under hedgerow system than in the sole maize treatment. Variability in maize yield across the alley was also observed under the hedgerow treatments which followed a dome-shape pattern. Maize performance was significantly poor in the lower row (LR) and upper row (UR) near the hedged. This was attributed to the imbalance in the distribution of PAR across the alley due to the bagras hedgerow.</p>

<p>Title:</p> <p>Author:</p> <p>Adviser:</p> <p>Program:</p> <p>Year:</p> <p>Abstract/Executive Summary:</p>	<p>Comparative assessment of eucalyptus species and provenances at BFI, Bukidnon, Northern Mindanao, Philippines</p> <p>Pollisco, Mitzi, T</p> <p>Umali, Mercedes Garcia</p> <p>Doctor of Philosophy with Specialization in Forestry: Silviculture and Forest Influences</p> <p>2005</p> <p>Seventh (7) year quantitative and qualitative traits of four (4) Eucalyptus species and provenances of the Bukidnon Forests, Inc. (BFI) were evaluated at Siloo, Dalirig, Manolo Fortich Bukidnon, were evaluated. The experimental materials were open-pollinated families of <i>E. grandis</i>, <i>E. pellita</i>, and <i>E. urophylla</i>, and a hybrid, <i>E. deglupta</i> x <i>E. pellita</i>. The traits evaluated were stem diameter, height, volume, specific gravity, fiber length, stem straightness, forking, circularity, crown health, branch angle, branch diameter and branch pruning characteristics. The experiment was laid out in Randomized Complete Block Design (RCBD) with three (3) blocks and the 15 seed lots were assigned in rows. Blocks I and III were located on a south-facing slope while Block II was located on a north-facing slope. The study revealed that the growing environment had a strong influence on growth and other traits of eucalypts. Significant to highly significant differences were found among all seedlots on the traits evaluated. Low to high heritabilities were observed on the traits of the open-pollinated species. Results of the phenotypic analyses would show a highly significant, strong and positive relationship between diameter and height of the open-pollinated species. The other traits had varied relationships. Genotypic correlation ranged from zero to 0.99, depending on traits correlated.</p>
<p>Title:</p> <p>Author:</p> <p>Adviser:</p> <p>Program:</p> <p>Year:</p> <p>Abstract/Executive Summary:</p>	<p>Phytoremediation potential of three agroforestry species in copper contaminated soils in Marinduque, Philippines</p> <p>Tulod, Adrian</p> <p>Castillo, Arturo, SA</p> <p>Master of Science in Silviculture and Forest Influences</p> <p>2011</p> <p>Mineralogical and geochemical characteristics of soil are two of the most important parameters to consider in evaluating the effect of soil in landslide susceptibility assessments. This study examined the geochemistry and mineralogy of soils from areas with and without landslide occurrences along the stations 11 to 17 of the Mariang Makiling trail, Mt. Makiling Forest Reserve in Laguna, Philippines. The mineralogical and major element compositions</p>

	<p>were carried out using X-ray Diffraction (XRD) and X-ray Fluorescence (XRF) techniques. Soil colloid analysis revealed that most of the soil samples are non-expansive types of clay. This is further confirmed by the XRD data, whereas soil samples taken from areas with and without landslides are made up of inactive (non-expansive) types of clays such as kaolinite/chlorite and illite. The computed weathering indices values such as the chemical index of alteration (CIA), chemical index the weathering (CIW) and plagioclase index of alteration (PIA) ranges from (59.72 to 94.81%), (63.13 to 96.43%) and (60.90 to 96.37%), respectively. These values indicate moderate to advanced weathering of plagioclase to kaolinite for both areas with and without landslides. The results of the study will hopefully provide a means of evaluating the influence of mineralogical and geochemical properties of soil in the landslide occurrences in the areas with volcanic lithologies.</p>
<p>Title:</p> <p>Author:</p> <p>Adviser:</p> <p>Program:</p> <p>Year:</p> <p>Abstract/Executive Summary:</p>	<p>Analysis of effectiveness of protection strategies in Barobbob watershed, Nueva Vizcaya and La Mesa watershed, Quezon City, Philippines</p> <p>Perez, Maricon Reyes</p> <p>Cruz, Rex Victor O.</p> <p>Master of Science in Forest Resource Management</p> <p>2008</p> <p>The study was conducted to determine the factors that influence the effectiveness of protection strategies applied to Barobbob watershed in Nueva Vizcaya and La Mesa watershed in Quezon City, Philippines. The gathered date were water analysis on pH and total suspended solid (TSS), field visits/observation, socio-economic survey using prepared questionnaires, focus group discussions with key informants, personal interviews and through GIS. Result of the study revealed that multi-agency management approach was applied in managing and protecting the watershed resources that primary focus on the maintenance of water quality for domestic purposes. Likewise, La Mesa watershed management implemented a centralized mangement system and regulatory protection startegies, whereas, Barobbob watershed demonstrated a co-management system and developmental protection strategy. The performance of the 3 determing factors namely, factors I (Physical/Site factors), II (Sociio-economic facotrs) and II (Institutional factors) were considered in the ex-post analysis of protectionStrategies implemented in the study sites. The improvement of the effectiveness protection startegy for a watershed was based on the individual factor performance. It required enhancement of associated measures under a factor with the lowest rating of accomplishment by the mangement and simustaneously satisfying the desire of stakeholder to focus on identified factor with the highest rating. Results revealed that for Borobbob watershed, Facor II has the highest importance based on</p>

	<p>stakeholder's perspective while Factor I with the least importance as per accomplishment rating by the management. In the case of La Mesa watershed, Factor I had the highest importance as per stakeholders' perspective but accomplishment rating by the management showed Factor II with the least importance. Hence, enabling and constraining factors that influenced the effectiveness of protection strategies therefore vary from one watershed to another, situational and are location specific.</p>
<p>Title:</p> <p>Author:</p> <p>Program:</p> <p>Year:</p> <p>Abstract/Executive Summary:</p>	<p>Carbon determination using field techniques and modeling of smallholder tree farms in Leyte Island, Philippines</p> <p>Sales, Renezita F.</p> <p>Master of Science in Silviculture and Forest Influences</p> <p>2005</p> <p>The role of terrestrial ecosystem in mitigating the effects of climate change entails the assessment of carbon stock in various pools. This study predicted the carbon storage and sequestration potential of common tree farm species in Leyte Island, Philippines using models that were parameterized to smallholder farm conditions. Data gathered from field measurements was used to fit the Chapman-Richards growth function to predict the volume and biomass increment of <i>Gmelina arborea</i> and <i>Swietenia macrophylla</i> tree farms until they reached their respective rotation ages. Predicated values, secondary sources and default values served as inputs to the CO₂ Fix model to stimulate the carbon stocks and fluxes in the above-ground biomass, soil and products for three rotation periods. Results showed that biomass and carbon density values varied with age, type of species, site conditions and silvicultural treatments applied in the stand. Although farm age and no relation with its soil carbon storage, this pool had greater storage capacity than the above-ground biomass and roots. By fitting the Chapman-Richards functions, results showed that the average maximum growth was attained after 10 years for <i>G. arborea</i> and 13 years for <i>S. macrophylla</i>. Volume growth started to slow down when the tree species reached almost half its rotation age. The same trend was observed from the biomass and carbon density of each farm. The maximum mean annual increment of both farms was attained before the expected maximum growth year. Growth increment decreased as the species reached its rotation age. The total C storage capacity of a 15-year-old <i>G. arborea</i> tree farm was estimated of 64 MgC ha⁻¹ while a 25-year-old <i>S. macrophylla</i> was estimated at 159 MgC ha⁻¹. The use of <i>S. macrophylla</i> as tree farm species was found to effectively store and sequester more carbon in the atmosphere, above-ground, soil and products as compared to farms planted with <i>G. arborea</i>.</p>