# Fellowship report

## *Timber concessions in Peru: a case study of the management capacity of SMFEs*

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**Floaters:** There was less investment in roads among SMFEs in Manu and Tambopata which had water access to their forest concessions.
*Photo: R. Cossío*

Madre de Dios is one of the few mega-diverse zones in the world, which possesses some of the last intact commercial populations of *Swietenia macrophylla* (big leaf mahogany). This region, which is the third largest producer of timber in Peru, has been suffering from severe forest degradation for the past several years, due in large part to illegal logging of mahogany. Since implementation of a new legal framework for more responsible forest management in Peru (the 2000 Forestry and Wildlife Law N° 27308), private small-medium forest enterprises (SMFEs)[1] have become the main social actors engaged in commercial forestry through the granting of long-term forest concessions that requires the elaboration of management plans. Despite the key role that SMFEs are playing in the management of the production forests of Madre de Dios and the local economy, there is little information available with respect to their economic performance and capacities.

This article summarizes the results of an evaluation of the capital and capabilities of 29 private SMFEs which were granted forest concessions (for a period of 40 years) in Madre de Dios in 2002. The study was carried out to address the extent to which different capital assets differentiate among SMFEs, and how those assets influence their forest management relative to that prescribed by the Peruvian Forestry Law. SMFE managers were interviewed about the forms of capital (i.e., produced, natural, human, and social)[2] that defined the productive assets they needed to pursue their management activities. These forms of capital, constituting the main components of SMFE capacity, were measured in terms of capital accumulated for each SMFE's first five years of operation (i.e., from 2002 to 2006)[3]. An exploratory factor analysis was used to determine the number of indicators that best represented each type of capital, and an analysis of variance determined variation in the capital of private SMFEs in the three provinces of Madre de Dios to allow geographic comparisons.

## Capacities for forest management

SMFEs in Madre de Dios exhibit varying capacities for forest management among provinces; especially in terms of their produced and natural capital assets (see table). SMFEs in Tahuamanu exhibited larger values of produced capital (i.e., more value in equipment and constructed roads, more value in loans received and larger areas) than in Tambopata and Manu. Also, SMFEs in Tahuamanu had greater volumes of mahogany (the most valuable timber species in the country) than in Tambopata and Manu. In Tambopata, SMFEs had almost double the approved volume of cedar (the second most valuable species in the country) than SMFEs in the other two provinces. SMFEs in Manu were characterized by the presence of lower priced and lesser-known timber species, which also explains the need to harvest larger volumes of timber (70% of their

1 In Peru, private SMFEs are defined as enterprises formed by sole proprietors or groups of individuals with gross capital of less than US$3,000,000; furthermore, they employ less than 200 permanent workers engaged in timber management through the holding of forest concessions.

2 Produced capital refers to material, human-made and financial resources. Natural capital is the timber stocks. Human capital refers to the skills of individuals and their acquired knowledge of activities. Social capital includes features of social organization that facilitate cooperation and coordination.

3 This period constitutes a grace period that the State granted to SMFEs to manage their forests without the elaboration of a forest inventory of their concession area (instead using only an existing governmental study), and included a promotional regime of discounts on the payment of harvesting fees.

total approved volume) in this province to compensate for the lower market value. The presence of mahogany provided SMFEs in Tahuamanu with financial advantages that allowed them to fulfill their operational obligations and invest in better equipment, which was not the case of SMFEs in the other two provinces.

In contrast, there is not much variation in SMFE capacities among the three provinces of Madre de Dios in terms of their human and social capital assets (see table). Most SMFEs were formed as associations called *Sociedades Anónimas Cerradas*, allowing up to 20 members and dividing the capital of the enterprise into shares. Such associations constituted a means for small loggers to pool their individually limited capital to form a more viable enterprise. However, associations also created disadvantages for several SMFEs due to disagreements and misunderstandings among members. This caused many divisions among members and affected the operations and management of SMFEs and their concessions. Limited coordination also hampered enterprises in payment of their harvesting fees on time because of disagreements among members over the amount necessary to fulfill their respective responsibilities. The lack of effective organization also limited SMFEs opportunities to receive assistance from NGOs.

Many SMFE members in Tahuamanu and Tambopata had prior experience in logging mainly due to informal activities. Consequently, most SMFE knowledge of logging was limited to the selective extraction of mahogany and cedar. With the new forest regime, concessionaires have been exposed to the concept of sustainable forest management (versus simple timber extraction) with its greater technical demands. However, formal training was limited to a few SMFEs via assistance by NGOs, and it was not sustained with no follow-up training after the NGO assistance ended.

## Conclusion

SMFEs in Madre de Dios vary greatly in terms of their forest management capabilities. Most SMFEs lack adequate capacity for sustainable forest management. However those that attained FSC certification had more valuable timber resources and physical infrastructure. SMFE capacities depend greatly on external mechanisms to ensure consistent technical and financial assistance. Important implications of this study include the need for policies that can strengthen the institutional framework to maintain more responsible forest practices in the future and can develop SMFEs' capacities for forest management with mechanisms that secure on-going assistance as well as access to information.

## Reference

Cossío R.E. 2009. Capacity for timber management among private small-medium forest enterprises in Madre de Dios, Peru. PhD Dissertation, University of Florida, USA.

**Indicators of forest management capacity for private SMFEs in Madre de Dios, 2002-2006**

| Indicators | Tahuamanu n=12 | Tambopata n=6 | Manu n=9 | Total n=27 |
|---|---|---|---|---|
| Produced capital | | | | |
| Equipment ($) | 113,940 [a, b] | 14,237 [a] | 6,960 [b] | 56,124 |
| Roads ($) | 169,083 [b] | 22,906 | 2,587 [b] | 81,100 |
| Harvesting fee ($) | 122,892 [b] | 88,631 | 48,477 [b] | 90,473 |
| Loan ($) | 55,953 | 7,504 | 8,189 | 29,265 |
| Management plans ($) | 42,222 [b] | 20,380 | 10,657 [b] | 26,847 |
| Area (ha) | 40,595 [b] | 24,242 | 18,899 [b] | 29,729 |
| **Natural capital** | | | | |
| Approved timber volume ($m^3$/ha) | 34.54 | 26.35 | 35.25 | 32.96 |
| A category | 2.26 [a, b] | 0.79 [a, c] | 0.22 [b, c] | 1.25 |
| B category | 0.76 [a] | 1.87 [a, c] | 0.88 [c] | 1.05 |
| C category | 5.35 [a, b] | 16.24 [a] | 20.63 [b] | 12.86 |
| D category | 14.10 [a, b] | 2.94 [a] | 3.38 [b] | 8.04 |
| E category | 12.08 [a] | 4.51 [a] | 10.14 | 9.75 |
| Species per POA (N°) | 14.67 | 12.30 | 14.12 | 13.96 |
| Harvested timber volume ($m^3$/ha) | 6.34 [b] | 13.29 | 24.63 [b] | 13.98 |
| A category | 1.87 [b] | 0.79 [c] | 0.22 [b, c] | 1.08 |
| B category | 0.23 [a] | 1.54 [a, c] | 0.60 [c] | 0.64 |
| C category | 0.56 [a, b] | 8.72 [a] | 16.51 [b] | 7.69 |
| D category | 2.77 | 0.85 | 1.71 | 1.99 |
| E category | 0.92 [b] | 1.41 [c] | 5.58 [b, c] | 2.58 |
| Species per POA (N°) | 4.40 [b] | 7.10 | 11.10 [b] | 7.23 |
| **Human capital** | | | | |
| Enterprise members (N°) | 7.42 | 4.83 | 10.33 | 7.81 |
| Logging experience (N° members) | 7.00 | 3.83 | 4.33 | 5.41 |
| Business experience (N° members) | 7.00 | 4.17 | 4.33 | 5.48 |
| Education (schooling years) | 12.50 | 11.00 | 10.56 | 11.52 |
| Members' performance (%) | 66.68 | 72.25 | 66.68 | 67.92 |
| Social capital | | | | |
| Density of membership (N°) | 0.58 | 1.17 c | 0.11 c | 0.56 |
| Participation (%) | 80.75 | 79.47 | 74.33 | 78.33 |
| Networks (%) | 53.96 | 60.32 | 53.94 | 55.37 |
| Exclusion (%) | 36.90 | 16.67 | 25.40 | 28.57 |
| Trust (%) | 73.61 | 79.87 | 73.61 | 75.00 |
| Conflict (%) | 16.70 | 0 | 11.11 | |

Notes: [a] denotes 95% significance between Tahuamanu and Tambopata
[b] denotes 95% significance between Tahuamanu and Manu
[c] denotes 95% significance between Tambopata and Manu
POA = annual operating plan


**Big investment:** The value of equipment possessed by SMFEs in Tahuamanu (some of which are FSC certified) was much larger than in other regions. *Photo: R. Cossío*

# 2012 Fellowships awarded

**Spring: 28 awards, total value US$140,750, 17 countries, 13 female fellows**

Mr. **Adedeji**, Gabriel Adetoye Adedeji (Nigeria) PhD program in forest resources management, University of Ibadan, Nigeria; Ms. **Appiah**, Catherine (Ghana) PhD research in plant ecology, Hokkaido University, Sapporo, Japan and study visit to Harvard University Forest, U.S.A.; Dr. **Awoyemi**, Lawrence (Nigeria) Study tour on "Turning Environmental Filth Into Wealth: Production of Wood Plastic Composites From the Sawmill Waste", Oregon State University, Corvallis, U.S.A.; Dr. **Carvalho**, Alexandre Monteiro (Brazil) 12th World Conference on Timber Engineering, Auckland, New Zealand; Ms. **Chiu Lopez**, Brenda Geydi (Mexico) Short training internship on "Five Year Management and Monitoring Plan for Billy Barquedier National Park, Stann Creek Valley Road, Belize", Steadfast Tourism and Conservation Association, Belize; Mr. **Daramola**, Tolulope Mayowa (Nigeria) Research internship, School of Environmental and Forest Sciences, University of Washington, Seattle, U.S.A.; Mr. **Dimobe**, Kangbéni (Togo) PhD research on "Contribution to the Management of Woodland Wildlife Reserve of the Oti-Mandouri in Northern Togo: Natural Regeneration, Structure, Dynamics and Impacts of Recent Climate Changes", University of Lome, Togo; Ms. **Flores Ramírez**, Guadalupe Araceli (Mexico) Masters program in international ecology at ECOSUR, Chetumal, Mexico (in collaboration with University of Sherbrooke, Quebec, Canada); Ms. **Gonmadje**, Christelle Flore (Cameroon) PhD research on "Characterization of Plant Diversity and Sustainable Management of Tropical Forest Ecosystems" at Agricultural Research Institute For Development (IRAD) National Herbarium, Yaounde, Cameroon; Ing. **González Cabello**, Frida Blanca Ismenia (Peru) XXIV International Intensive Course on Diversified Management of Tropical Natural Forests at CATIE, Turrialba, Costa Rica; Ms. **Ilieva**, Lili Encheva (Bulgaria) PhD research on "Paving the Way to Designing a REDD Framework: Pro-poor Benefits Distribution in the Brazilian Amazon" under the supervision of Amazon Environmental Research Institute (IPAM), Brasilia, Brazil; Mr. **Lokossou**, Achille Orphée (Benin) Masters program in management of natural resources and biodiversity at University of Abomey, Calavi, Benin; Dr. **Momo Solefack**, Marie Caroline (Cameroon) Study tour on "Demographic Characterization and Anatomy of *Gnidia glauca* (Thymelaeaceae) on Mount Oku" to the Royal Museum for Central Africa in Tervuren, Belgium; Dr. **Ne Win**, Rosy (Myanmar) Technical document on "Population Dynamics of Commercial Tree Seedlings after Selective Logging in Kabaung Reserved Forest of Bago Mountains, Myanmar"; Mr. **Nugroho**, Brainindityo (Indonesia) 40th International Forestry Student Symposium in Yagmur, Turkey; Ms. **Obeng**, Gifty (Ghana) Masters research on "Conversion of an Agroforestry System into Clean Development Mechanism Forestry in Ghana: Capacity Assessment of Kranka Community Farm Plantation" at Brandenburg University of Technology, Cottbus, Germany; Mr. **Palacios Hernández**, Fernando Nohelio (Guatemala) XXIV International Intensive Course on Diversified Management of Tropical Natural Forests at CATIE, Turrialba, Costa Rica; Ing. **Pinzon Rivas**, Agusto Gregorio (Ecuador) XXIV International Intensive Course on Diversified Management of Tropical Natural Forests at CATIE, Turrialba, Costa Rica; Ms. **Putri**, Winda Utami (Indonesia) Vegetation Survery Training Course at Royal Botanical Gardens, Kew, U.K.; Ms. **Racelis**, Elenita Licong (Philippines) International Conference on Sustainable Forest Management Adapting to Climate Change in Beijing, China; Dr. **Ramachandran**, Sundararaj (India) International Sandalwood Symposium 2012 at University of Hawaii, Honolulu, U.S.A.; Ing. **Requena Rojas**, Edilson Jimmy (Peru) Study tour on "Growth Rate of *Cederela odorata* and its Effects on Precipitation and Temperature in the Long Term Growth in the Central Amazon in Peru" at the Argentine Institute of Snow Research Glaciology and Environmental Science in Mendoza, Argentina; Ms. **Reyes Carranza**, Laura Mariana (Mexico) Short course on "Economic Basis for the Management and Valuation of Environmental Services" at CATIE in Turrialba, Costa Rica; Mr. **Sugianto**, Antonius (Indonesia) Intensive training course on "Advanced Furniture Production, Furniture Design and Wood Machining" at the University of Melbourne and study visit to furniture manufacturing companies and International Furniture Exhibition FURNITEX in Melbourne, Australia; Mr. **Suryoatmono**, Bambang (Indonesia) 12th World Conference on Timber Engineering in Auckland, New Zealand; Dr. **Thulasidas**, Puthenpurayil Kumaran (India) IUFRO All Division 5 Conference in Lisbon, Portugal; Ms. **Viguera Moreno**, Bárbara (Spain) XXIV International Intensive Course on Diversified Management of Tropical Natural Forests at CATIE, Turrialba, Costa Rica; Dr. **Zobi**, Irié Casimir (Côte d'Ivoire) Technical document on "Contribution to Sustainable Forest Management of Natural Wetlands in Côte d'Ivoire: Modeling the Dynamics of Major Species of Permanent Silvicultural Systems of Mopri and Irobo"

**Autumn: 23 awards, total value US$148,435, 15 countries, 10 female fellows**

Ms. **Akpene**, Afiwa Dzibgodi Akpene (Togo) Technical document on "Development of a Strategy for Improving the Performance of Teak in Togo"; Ms. **Arellano Nicolás**, Edith (Mexico) Masters program in management and conservation of tropical forests and biodiversity at CATIE in Turrialba, Costa Rica; Dr. **Assogbadjo**, Achille Ephrem (Benin) Technical document on "Assessing Population Structure and Dynamics of the Declining *Afzelia africana* Sm. Tree Species for its Sustainable Management in the Protected Areas of Benin (West Africa)"; Mr. **Bandoh**, William Kwame Nuako (Ghana) Short training course on "Application of Molecular Genetic Markers for Timber Tracking in Africa" at Kenya Forestry Research Institute in Nairobi; Dr. **Fongnzossie**, Fedoung Evariste (Cameroon) Research on "Assessment of Vulnerability to Climate Change in Adjacent Community of Mangrove Forests in Manoka Island, Litoral Region in Cameroon"; Mr. **Geply**, Johnson Jlokpeh (Liberia) PhD research on "Assessment of Liberia Forest Policy and Administration before and after the Civil War" at the University of Ibadan, Nigeria; Ms. **Heindorf**, Claudia (Germany) Technical document "Manual of Sustainable Forestry Practices in the Tropics of Mexico that Increase Productivity and Contribute to National Goals of Mitigating the Effects of Climate Change"; Dr. **Javaregowda**, Javaregowda (India) Short training course on "Competing Claims on Natural Resources: Professional Qualities for Managing Conflict in Natural Resource Management towards Sustainable Development" at Wageningen UR Centre for Development Innovation in the Netherlands; Mr. **Kurniawan**, Yuyun (Indonesia) Masters research on "Tropical Forest Dynamics after Logging: A Comparison Study between RIL and Non- RIL Practices in Relation with Biodiversity and Forest Carbon Stock" at University of Mulawarman, Indonesia; Ms. **Maroundou**, Audrey Pamela (Gabon) Short training internship on "Method and Techniques of GIS" at Institute of Tropical Ecology, Toulouse, France; Ms. **Massou**, Pamera Bibi-ntu (Côte d'Ivoire) PhD research on "Quantifying the Spatial and Temporal Variation in Aboveground Biomass in the Tropical Forest of Congo Basin under the REDD+ Context" at the University of Tübingen, Germany; Dr. **Maza Rojas**, Byron Vinicio (Ecuador) Lecture tour and Workshop on "Demonstration of Forest Industry in Chile", University of Lagos, Paillacar Alberto Silva, Chile; Mr. **Mensah**, John Kobina (Ghana) Short training course on "Application of Molecular Genetic Markers for Timber Tracking in Africa" at Kenya Forestry Research Institute in Nairobi; Mr. **Minn**, Yazar (Myanmar) World Teak Conference 2013 in Bangkok, Thailand; Dr. **Ndiade Bourobou**, Dyana (Gabon) Short training course on "Application of Molecular Genetic Markers for Timber Tracking in Africa" at Kenya Forestry Research Institute in Nairobi; Mr. **Njurumana**, Gerson Ndawa (Indonesia) PhD research on "Environmental Conservation Development on Kaliwu System at Sumba Island", Gadjah Mada University, Yogyakarta, Indonesia; Mr. **Opoku-Ameyaw**, Adu (Ghana) Masters research on "Seasonality and Environmental Determinants of Total and Component Soil CO2 Efflux in an Intact Tropical Moist Semi-deciduous Forest in Ghana", Kwame Krumah University of Science and Technology, Kumasi, Ghana; Ing. **Romero Rodriguez**, Irma Betty (Peru) XXV Intensive International Course on "Diversified Management of Tropical Natural Forests" at CATIE in Turrialba, Costa Rica; Ms. **Saha Tchinda**, Jean-Bosco (Cameroon) Short training internship on "Recovery of Waste Wood through the Isolation of Molecules with High Potential: Case of Waste of Azobe, Padouk, Tali and Moabi" at CIRAD in Montpellier, France; Ms. **Saw**, Aye Aye (Myanmar) Masters research on "Simulation Model of Community Based Mangrove Ecosystem Conservation and Rural Development in Myanmar: Case Study in Wunbaik Mangrove of Rakhine Coastal" at Kyoto University, Japan; Ms. **Tonouewa**, Murielle Jesugnon Fifamè Féty (Benin) Short training internship on "Physical and Mechanical Characterization of Wood of *Gmelina arborea* Roxb. of Benin" at CIRAD in Montpellier, France; Dr. **Wahyudi** (Indonesia) Publication of textbook "Non-Timber Forest Products" (in Indonesian); Ms. **Wong**, Melissa (Malaysia) IUFRO Annual Forest Tree Workshop in conjunction with Plant and Animal Genomes XXI Conference in San Diego, U.S.A.

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