

Jose Carlos Silva Macher

Ecological Economist, Ph.D.

Summary:

I am a Professional Engineer and Ecological Economist with more than 20 years of work experience. Associate Professor, Department of Economics, PUCP. My academic background includes: BSc in Food Science and Technology at the National Agrarian University La Molina in Peru (UNALM); MSc in Environment and Development at the London School of Economics and Political Science (LSE); and PhD in Environmental Science and Technology (with specialization in ecological economics and environmental management) at the Institute of Environmental Science and Technology (ICTA), Autonomous University of Barcelona (UAB). My PhD Thesis “Studies of Social Metabolism at the Commodity Frontiers of Peru” is an application of Georgescu-Roegen’s Flow-Fund theory to the study of ecological distribution conflict. It is a combination of economic purpose analysis based on Farrell’s Environmental valuation triadics approach and economic process analysis based on Giampietro and Mayumi’s Multi-scale integrated analysis of societal and ecosystem metabolism (MuSIASEM). The case studies include Camisea natural gas, Conga gold mine conflict, and Sierra del Divisor natural protected area in the Andes-Amazon region of Peru.

My academic experience as a teacher includes: undergraduate and postgraduate courses on ecological economics and sustainability (with different course names) at the Pontifical Catholic University of Peru (PUCP) since 2004 and the Antonio Ruiz de Montoya University (UARM) since 2010. I was the first Academic Director and founder of the new career on Economics and Environmental Management at UARM. In addition, I teach courses on sustainability topics (in English/ Spanish) for international students visiting Peru, including fieldwork in the Andes-Amazon region.

My professional engineer experience includes Quality assurance assistant and Environmental officer, Nestlé Peru S.A., Chiclayo Factory, Lima Factory (1996-2002); Environmental engineer, Nestlé UK Ltd., Dalston Factory (2003); Environmental consultant, EMR Peru (2004-2006); and Environmental consultant, ERM Iberia (2007). Consultant, Global Reporting Initiative Project, Grupo La Seda de Barcelona (2007-2009).

Publications:

Farrell, K.N. and **Silva-Macher, J.C.** (2017) Exploring Futures for Amazonia’s Sierra del Divisor: An Environmental Valuation Triadics Approach to Analyzing Ecological Economic Decision Choices in the Context of Major Shifts in Boundary Conditions. *Ecological Economics* 141, 166–179.

Silva-Macher, J.C. (2015) A metabolic profile of Peru: An application of Multi-scale integrated analysis of societal and ecosystem metabolism (MuSIASEM) to the mining sector’s exosomatic energy flows, *Journal of Industrial Ecology*, Volume 20, Number 5. DOI: 10.1111/jiec.12337

Silva-Macher, J.C. and Farrell, K.N. (2014) The flow/fund model of Conga: exploring the anatomy of environmental conflicts at the Andes-Amazon commodity frontier, *Environ Dev and Sustain* (2014) 16: 747-768. DOI: 10.1007/s10668-013-9488-3

Russi, D., Gonzalez-Martinez, A.C., **Silva-Macher, J.C.**, Giljum, S., Martinez-Alier, J., and Vallejo, M.C. (2008) Material Flows in Latin America: A Comparative Analysis of Chile, Ecuador, Mexico, and Peru, 1980–2000, *Journal of Industrial Ecology*, Volume 12, Numbers 5/6, 704-720. DOI: 10.1111/j.1530-9290.2008.00074.x

Silva-Macher, J.C. (2015) Algunas reflexiones sobre la relación entre economía y ambiente, *en Bernex, N. y Castro, A. (Eds.) Río+20: Desafíos y Perspectivas*, Fondo Editorial de la Pontificia Universidad Católica del Perú. ISBN: 978-612-317-126-1.

Areas of expertise:

- Food science and technology.
- Environmental social sciences.
- Quality management systems.
- Environmental management systems.
- Environmental, health and safety (EH&S) due diligence audits.
- Environmental Impact Assessment (EIA).

Education:

- Nexus-MuSIASEM Summer School. ICTA-UAB. Spain, 2019.
- PhD in Environmental Science and Technology (Ecological Economics and Environmental Management). ICTA-UAB. Spain, 2006 – 2016.
- Environmental Management Systems Summer School. UAB. Spain, June 2007.
- MSc in Environment and Development. LSE. United Kingdom, 2002 – 2003.
- Environmental Management Program for the Latin American Industry. CDG (InWent). Chile and Germany. 1998.
- Diploma in Agriculture Business Management. UNALM. Peru. 1994 – 1995.
- BSc in Food Science and Technology Engineer. UNALM. Peru. 1989 – 1994.

Languages and skills:

- Spanish (native).
- English (advanced).
- Mathematics (800/800 Quantitative section of the Graduate Record Examination, GRE)

Teaching:

- Course: Economics, Natural Resources and the Environment. Graduate School, Master in Economics, PUCP. Lima, Peru. 2004 – Present.
- Course: Sustainable Development. Graduate School, Master in Human Development, PUCP. Lima, Peru. 2013 – Present.
- Courses: (1) Introduction to Ecological Economics, (2) Social Multi-Criteria Evaluation. Faculty of Social Sciences. UARM. Lima, Peru. 2010 – Present.
- Course: Intercultural Local Economic Development. Institute of Ethics and Development. UARM. Cusco and Puno, Peru. 2011.
- Course: Natural Resources Management. Faculty of Economics, Pacifico University. Lima, Peru. 2010 – 2012.

- Course: Natural Resources Economics and the Environment. Faculty of Social Sciences. Economics. PUCP. Lima, Peru. 2005 – Present.
- Course: Theory of Development. Faculty of Social Sciences. Economics. PUCP. Lima, Peru. 2017 – Present.
- Course: Sustainable Development and Climate Change. Postgraduate School. PUCP. Lima, Peru. Present.

Conferences:

- **XIII Encuentro Nacional de la Sociedad Brasileña de Economía Ecológica (ECOECO) ¿Será el Antropoceno la era del colapso ambiental? Pensando una economía para el Planeta Tierra.** UNICAMP, Campinas, SP, Brasil. Septiembre de 2019.
- **XVII Biennial IASC Conference 'In Defense of the Commons: Challenges, Innovation, and Action'.** PUCP. Lima, Peru. July 2019. Member of the General Organizing Committee.
- **II Congreso de la Sociedad Andina de Economía Ecológica (SAEE) Justicia Ambiental y Alternativas al Desarrollo: aportes de la Economía Ecológica y la Ecología Política.** PUCP. Lima, Peru. April 2019. Conference Chair.
- **VI Congreso Iberoamericano sobre Desarrollo y Ambiente, 2013.** Red Iberoamericana de Economía Ecológica. Facultad Latinoamericana de Ciencias Sociales (FLACSO). Quito, Ecuador. 11-13 December 2013.
- **12th Biennial Conference of the International Society for Ecological Economics (ISEE), 2012.** Ecological economics and Rio+20: contributions and challenges for a green economy. Rio de Janeiro, Brazil. 16-19 June 2012.
- **International Union for Conservation of Nature (IUCN). World Conservation Congress.** Barcelona, 5-14 October 2008.
 - **Ethnographic research of the IUCN Congress** as part of the project: Advancing Conservation in a Social Context (ACSC).

Projects:

Project on Secondary Forests Management in the Coast, Andean and Amazonian regions of Peru. PUCP (Concytec-Banco Mundial). Lima, Peru. 2019-Present.

- Coordinator of the economic component. Responsible for evaluating the economic potential of secondary forests for local populations.

Prevention of malaria vectors in rice production in Jequetepeque Valley. La Libertad, Peru. Independent Consultant, January-April 2016.

- Multi-disciplinary research (Environmental, Social and Economic) of rice production in Jequetepeque in order to evaluate an irrigation technology with intermittent dry. This technology reduces the reproduction of malaria vectors in the rice fields.

Consortium of Economic and Social Research (CIES). Employee. Lima, Peru. July 2014 – December 2015.

- Project Director. Design of the National Training Plan on Climate Change (PNCCC) with a team of four consultants. Direct coordination with the Ministry of Environment.
- Environmental Advisor. Implementation of the Diploma in Public management, natural resources and the environment for Regional Governments in Peru (Cusco, Arequipa, La Libertad, Piura, and Loreto).

Ministry of Environment. Office of Planning and Budget. Consultant. Lima. Peru. March 2014.

- Performance-based budgeting design project (Annex 2). Environmental prevention and remediation/ recovery of contaminated sites and destroyed areas due to illegal mining (artisanal and small scale).

Ministry of Economics and Finance. General Directorate of Public Budget. Consultant. Lima. Peru. May 2013.

- Performance-based budgeting design project (Annex 2). Integrated solid waste management. Direct coordination with the Ministry of Environment.

School of Economics and Environmental Management. Jesuit University Antonio Ruiz de Montoya (UARM). Employee. Lima, Peru. October 2010 – August 2012

- Member of the advisory group that create this new career in Economics and Environmental Management.
- First Academic Director. Key tasks: Career study plan review, teacher recruitment, setup of the Academic Council, and organization of events. In addition to teaching classes.

Global Reporting Initiative (GRI) project – Group La Seda de Barcelona. Researcher. Spain. October 2007 – September 2009.

- Researcher/advisor ICTA-UAB: design and implementation of the CSR strategy. The project was an agreement between UAB and La Seda de Barcelona. Development of the first sustainability report according to the GRI standard.
- Analysis of the environmental management practices in 18 plants, grouped into 5 divisions: PET, PTA, Preforms, Chemistry and Recycling, which in turn are divided into the following 10 countries: Germany, Belgium, Spain, France, Greece, Italy, Morocco, Portugal, United Kingdom and Turkey.
- Design of the follow-up strategy for the improvement in economic, environmental and social performance indicators.

Final Financial Report for the project CN/ASIA PRO ECO/13 of the European Union. Researcher. Spain. October 2007.

- Researcher/advisor ICTA-UAB: preparation of final financial report of the cooperation project: Building Capacities for Corporate Environmental Management - A Survey of Experiences in the Yunnan and Jiangsu Provinces of the PR China.

Environmental Resources Management (ERM) Iberia. Consultant. Barcelona, Spain. November 2006 – April 2007.

- Environmental, Health and Safety Due Diligence audits in the following locations:
 - A factory of refrigerators in Vitoria, Basque Country.
 - Two factories of ceramic products in Castellon, Valencia.
- Site Investigation and Remediation phase 1 audits in the following locations:
 - Procter&Gamble factory of detergents in Mataro, Catalonia.
 - Hayes Lemmerz factory of car components in Barcelona, Catalonia.

Environmental Resources Management (ERM) Perú S.A. Consultant. Lima, Peru. November 2003 – July 2006.

- Environmental, Health and Safety Due Diligence audits in the following locations:
 - A factory of explosives in Cochabamba, Bolivia.
 - A laboratory for physical, chemical and microbiological analysis in El Callao, Peru.
 - A factory of food industry additives in Lima, Peru.
 - A factory of food industry additives in Guayaquil, Ecuador.
- Site Investigation and Remediation audits in the following locations:
 - Chevron-Texaco service stations in Ecuador.
 - Procter&Gamble factory of detergents in Lima, Peru.
- Integrated management systems of quality, environment, and health & safety audit in Duke Energy power plant of Chiclayo and hydroelectric of Carhuaquero, based on the standards ISO 9001, ISO 14001, and OHSAS 18001.
- Environmental management system - gap analysis. Pluspetrol Norte S.A. Block 1-AB and Block 8. Site visits of the oil fields: Valencia, Capirona, Pavayacu,

Trompeteros, and Yanayacu in northern Amazon, Peru.

- Environmental management systems gap analysis. Pluspetrol Perú Corporation S.A. – Project Camisea. Site visit of the hydrocarbons (natural gas and liquids of natural gas) fractionation plant of Las Malvinas in southern Amazon, Peru.
- Environmental Impact Assessment (EIA). Pluspetrol Perú Corporation S.A. – Project Camisea – Block 56. Development of environmental management plans of the EIA and coordination of logistics for the preparation of the baseline studies.
- Equator Principles Review. Citigroup Venture Capital – Oil Block 67 in northern Amazon, Peru. Preparation of the technical report using Geographic Information Systems.

Environmental Management Training Program for the Latin American Industry. Centro de Desarrollo Industrial (CDI), Sociedad Nacional de Industrias. Lima, Peru. January – December 2000.

- CDI consultant: design and implementation of training courses on environmental management systems – ISO 14001.
- Aimed at industry professionals with roles and responsibilities in environmental management issues.

IPPC Report. Nestlé UK Ltd. Carlisle, United Kingdom. July – September 2003.

- Environmental Engineer: phase one environmental assessment of the dairy products factory in Dalston.
- Preparation of a technical report in compliance with European Union Directive on Integrated Pollution Prevention and Control (IPPC).
- Audit of the wastewater treatment system, given its direct relation with the quality of the river Caldew, a Site of Special Scientific Interest (SSSI) according to English Nature.

Environmental Management System. Nestlé UK Ltd. Carlisle, United Kingdom. July – September 2003.

- Environmental Engineer: review and update of the Nestlé Environmental Management System (NEMS) of the Dalston Factory.
- Preparation of the NEMS Manual, including the organization of three continuous improvement groups: (a) Energy, (b) Water, and (c) Packaging.

Environmental Management Systems (NEMS) and Pollution Prevention (P2) projects. Nestlé Perú S.A. Lima D'Onofrio Factory. Peru. January 2000 – September 2002.

- Environmental Officer: member of the Factory Executive Committee, responsible for environmental management in the two factories (Lima-D'Onofrio and Cajamarca), the distribution centers and the central office.
- Project supervision of the water pipelines and grease traps installation in the new factory Lima D'Onofrio. It includes the production lines of unsweetened condensed milk, culinary products, chocolates, biscuits and ice creams.
- Design and construction of the new recycling area of the Factory Lima D'Onofrio, and improvement of solid waste separation at source.
- Staff training in good manufacturing practices, considering the environmental aspects of saving water, energy and materials.
- Point of contact with the PUCP, during the preparation of Environmental Impact Assessment (EIA) of the new factory.
- Implementation of the monitoring system, including measurements of water quality, energy, chemicals, atmospheric emissions, solid wastes, and noise.
- Development of environmental procedures, in coordination with the Factory Executive Committee, and associated staff training.
- Preparation of the Factory Master Plan 2002 - 2005, considering proposals for wastewater treatment, conversion of residual oil to natural gas, and social projects with the community.

Nestlé Quality System (NQS), Environmental Management System (NEMS), and Pollution Prevention (P2) projects. Nestlé Perú S.A.

Chiclayo Factory. Peru. January 1996 – January 2000.

- Environmental Officer: responsible for environmental management in Factory Chiclayo, and Assistant of the Quality Assurance Manager. Implementation of the Nestlé Environmental Management System.
- Projects to reduce packaging materials, through reduction of thicknesses and weights, process optimization, and changes in product design. They include tin, flexible packaging, cartons, paper labels and plastics.
- Staff training in good manufacturing practices, considering the environmental aspects of saving water, energy and materials.
- Development of environmental procedures, in coordination with the Factory Executive Committee, and associated staff training.
- Research and development of new products: dairy products and instant drinks.
- Implementation of the Nestlé Quality System (NQS). Auditing of suppliers of raw materials and packaging materials.
- Sensory Analysis of raw materials and finished products.
- Technical evaluation of market products complaints, in coordination with the customer services department.
- Release of finished products to the market, in coordination with the departments of production, logistics, and marketing.

Other activities at Nestlé. 1997 – 2001.

- Nestlé Waters USA. Allentown Factory. Pennsylvania (2001): NEMS presentation during the High-Performance Factory Workshop.
- Nestlé USA. New Milford Farms. Connecticut (2000): site visit of the composting plant and training in environmental management.
- Nestlé Chile S.A. Central Office. Santiago de Chile (2000): Environmental Management Workshop – Andean Region.

- Nestlé Colombia. Pereira / Bugalagrande / Bogota (1997): Quality Management Workshops – Andean Region.

Scholarships and Awards:

- Russell E. Train, Education for Nature Program – World Wildlife Fund (WWF). Scholarship for study the first 2 years of the PhD in Environmental Sciences at ICTA-UAB. Barcelona, Spain, July 2006 – August 2008.
- PUCP Graduate School. Letter of recognition for outstanding teaching performance at the Masters in Economics. Lima, July 2006.

National Research Certification:

- **Registro Nacional Científico, Tecnológico y de Innovación Tecnológica (RENACYT-CONCYTEC).** Código de registro: P0040077. Grupo: Carlos Monge Medrano Nivel IV. Vigencia: desde 1/10/2019 hasta 1/10/2021. Fecha de emisión: 7/2/2020.

Contact information:

Permanent position: Profesor Asociado, Departamento de Economía, PUCP. Edificio Centenario. Oficina 504. Lima 32. Perú.

Permanent address: Calle Alfonso Ugarte 253, dpto. 203, Barranco, Lima 4. Perú.

Mobile: (51) 945.908.033

E-mail: jsilva@pucp.edu.pe