

**Final Report**  
**Sustainability Science Program**  
**Term: September 1, 2013 – August 1, 2014**

**Name:**

Judson Ferreira Valentim

**Your fields:**

- Agronomy
- R&D management
- Integrate analysis for ecologic and socioeconomic territorial zoning
- Strategic planning, policy analysis and impact assessment in agriculture
- Linking agricultural knowledge to policy action for sustainable development

**Your degree program, institution and graduation date:**

PhD, Agronomy, University of Florida, 1987

**Faculty host(s) at Harvard name and department:**

William C. Clark, Harvard Kennedy School of Government

**Description of SSP-related research activity:**

Mobilizing Science and Technology to Equitably Enhance Agriculture and Forestry Production, Food Security and Environmental Conservation in the Brazilian Amazon

**Abstract**

The Amazon Basin holds a large portion of the natural resources which play a vital role in the provision of goods and environmental services for the world. The Legal Amazon has some of the highest proportions of the rural population living in extreme poverty or below the poverty line in Brazil, with more than one million small farmers, extractive families and Indians still depending on governmental cash transfer programs and on slash and burn agriculture for food security, fuel and income. This paradox of poverty amongst one of the world's greatest nature's wealth has proven to be unsustainable. As a result, this region has been at the center of the debate regarding sustainable development and is the focus of attention of researchers, policymakers and the civil society at the local, national and international scales. Most assessments focus on environmental and economic impacts of the development process in the Legal Brazilian Amazon. We expand the analyses of the complex interactive social-environmental system to include the human, social, knowledge and policy dimensions of the productive base in assessing the actual impacts and future perspectives towards sustainable development in the region.

**Identification of the problem you address:**

How science and technology can be more effectively mobilized to address the goal of equitably enhancing agricultural and forestry production, food security and environmental conservation in the Brazilian Amazon?

**Key question asked about the problem:**

What are the major gaps and barriers in the innovation system towards the goal of increasing agricultural production and food security while conserving the environment in the Brazilian Amazon? What are the types of innovations that may have the greatest potential to overcome productivity constraints and increase vulnerable farmers' well being while conserving the environment? What are the most effective approaches for fostering innovation and successful farmer technology adoption, with particular focus on vulnerable farmers?

**The methods by which you answered that question:**

- Review of scientific and gray literature, official and internal reports;
- The Conceptual framework developed for the Project on Innovation and Access to Technologies for Sustainable Development (Moon & Matus, 2012) in the context of the Brazilian Amazon);
- Framework proposed by Clark et al. (2011) for assessment of work linking agricultural and forestry innovation systems to policy action in the Brazilian Amazon;
- Electronic and personal consultations with representatives key stakeholders in the agricultural and forestry sector in the Legal Brazilian Amazon.

**Principle literature upon which the research drew:**

- Innovation
- Science & technology studies
- Policy analysis

**Empirical data acquisition description:**

We conducted a literatures review and several electronic and personal consultations (interviews) with representatives key stakeholders groups, and researchers in order to access the effectiveness of the Agricultural and Forestry Innovation System towards the goal of increasing agricultural production, food security and environmental conservation in the Legal Brazilian Amazon.

**Geographical region studied:**

Legal Brazilian Amazon, Brazil

**Recommendations that might be relevant for your problem:**

NA

**A description of the final product(s) you have/are aiming to produce:**

- Article in the journals Global Environmental Change and Animal
- Book chapters (specified below)
- Reference publication for Embrapa's strategic policy decision making (listed below)
- Working paper

**Description of major other intellectual or professional advancement activity(ies) over the past academic year:**

- Collaboration in a working group at Embrapa to produce a document with a Vision 2014-2034: The Future of Technologic Development of the Brazilian Agriculture. This document is already being used to support Embrapa's strategic decision making processes (report listed below).
- Collaboration with Steve Vosti at UC Davis and IFPRI (Washington, DC) on a research project Understanding and Managing the Drivers of Land Clearing and Land Use in the Tropical Forest and Savannah Areas of Brazil and Argentina: Economy-wide & Global Perspectives.
- Linking Maja Temple, Ph.D. student at MIT, with Brazilian research organizations to support her research focusing on social and environmental certifications in agricultural value chain in the in the cocoa industry in Northeast Brazil.
- Linking Maron Greenleaf, doctoral student at Stanford University, with relevant actors in Brazil to support her field research (February to October, 2014) focusing on the topic Making More Than a Market: Carbon Credits and Distributive Politics in Acre, Brazil. I also met and shared with her my knowledge, views and perceptions regarding the climate change innovation and policies in Acre thorough an interview and access to personal publications and literature on the topic. I also provided her links with research institutions and state policy makers in Acre, where she is conducting field research between February and October, 2014.

- Sophia Watkins, undergraduate in the economics class at Harvard College, from Ecuador. We met and discussed her research interest in agriculture and sustainability issues in Brazil and possible focuses of her future research.

**Please list citations for reports, papers, publications and presentations that built on your fellowship research:**

- Strassburg, Bernardo B.N., Agnieszka E. Latawiec, Luis G. Barioni, Carlos A. Nobre, Vanderley P. da Silva, Judson F. Valentim, Murilo Vianna, Eduardo D. Assad. 2014. When enough should be enough: Improving the use of current agricultural lands could meet production demands and spare natural habitats in Brazil, *Global Environmental Change*, 28(Sept):84-97, doi: 10.1016/j.gloenvcha.2014.06.001
- Latawiec, A.E., B. B. N. Strassburg, J. F. Valentim, F. Ramos and H. N. Alves-Pinto. 2014. Intensification of cattle ranching production systems: Socioeconomic and environmental synergies and risks in Brazil. *Animal*, 8(8):1255–1263, doi:10.1017/S1751731114001566.
- Embrapa. 2014. *Visão 2014-2034: o futuro do desenvolvimento tecnológico da agricultura brasileira: síntese*. Brasília, DF : Embrapa. 43p. Available at: <https://www.embrapa.br/documents/1024963/1658076/O+Futuro+de+Desenvolvimento+Tecnol%C3%B3gico+da+Agricultura+Brasileira+-+s%C3%ADntese.pdf/ddb0a147-234d-47f1-8965-1959ef82311d>
- Schmink, M. et al. 2014. Forest citizenship in Acre, Brazil. In: Katila, P., Galloway, G., de Jong, W., Pacheco, P., Mery, G. (eds.). *Forests under pressure - Local responses to global issues*. IUFRO World Series Volume 32. Vienna. Pp. 31-47. (In press – Fall 2014).
- Valentim, J.F., Garret, R.D. Promoting the Well-Being of Small Farmers through Low Carbon Agriculture and Forestry Production Systems in the Brazilian Amazon Biome. In: *Caminhos para uma Agricultura Familiar sob bases Ecológicas: Produzindo com Baixa Emissão de Carbono*. IPAM/NEAD/MDA-SAF-INCRA/Embrapa (book chapter to be published in Portuguese in 2014).
- Valentim, J.F. Environmental Governance and Technological Innovations for Sustainable Development in the Amazon. In: Needell, J.D. (ed.). *Emergent Brazil: Key Perspectives on a New Global Power*. University Press of Florida. Book ISBN: 978-0-81-306067-5 / eBook ISBN: 978-0-81-305538-1 / Oxford Scholarship online ISBN: 978-0-81-305094-2 (book chapter to be published in the Spring of 2015).
- Valentim, J.F. Mobilizing Science and Technology to Equitably Enhance Agriculture and Forestry Production, Food Security and Environmental Conservation in the Brazilian Amazon. *Fall 2013 Seminar Series*, Sustainability Science Program, Harvard University.
- Valentim, J.F. Linking knowledge to policy action to improve agricultural and forestry production, human wellbeing and environmental conservation in the Brazilian Amazon. *Spring 2014 Seminar Series*, Sustainability Science Program, Harvard University
- Valentim, J.F.; Bragança, A.A. Socioeconomic and Environmental Impacts of Technological Innovation in the Brazilian Agricultural Frontier. *DRCLAS Brazil Studies Program Seminar*, Spring 2014, Cambridge.
- Costa, F.S., Amaral, E.F., Mattos, J.C.P., Bardales, N.G., Oliveira, M.V.N., Valentim, J.F., Araújo, E.A., Lani, J.L., Oliveira, C.H.A., Melo, A.W.F. Estimativas das emissões antrópicas e sumidouros de gases de efeito estufa do Estado do Acre. In: Costa, F.C., Amaral, E.F. (eds.). *Inventário de emissões antrópicas e sumidouros de gases de efeito estufa do estado do acre: ano-base 2012*. Rio Branco, AC: Embrapa Acre (under review).
- Andrade, C.M.S, Valentim, J.F., Wadt, P.G.S, Zaninetti, R.A. Recomendação de calagem e adubação para pastagens no acre – 2ª Edição. Rio branco, AC: Embrapa Acre. Circular Técnica (under review).

- Embrapa Acre. Sistema de Produção de Leite a Pasto no Acre. Rio Branco, AC. *Sistemas de Produção* (in final process of digital edition).
- Valentim, J.F. Overcoming the Brazilian Amazon Paradox: Linking knowledge and policy action to increase agriculture and forest production improve human well-being and conserve the natural resources. SSP Working Paper (being submitted for review).

**Please describe any collaborative activities with other SSP Fellows that you are involved with.**

- During the Spring (between march and may, 2014), with financial support from SSP and together with fellows Rachael Garrett, Pamela Templer, Nigel Asquith, and Zhu Liu, we successfully conducted the SSP Colloquium Series on Innovative Adaptation to Climate Change in the Agricultural and Forestry Sectors, between. A report of the results and findings of the series of events has been submitted to SSP.
- I am contributing to the research initiative on *Improving agricultural practices in Brazil for Sustainable Development: Enabling conditions for innovation through integration*, led by Rachael D. Garrett. I also helped to establish research collaboration with Embrapa research centers in the states of Acre, Mato Grosso and Para. Since Rachael Garrett became an Assistant professor at the Earth and Environmental Sciences Department at Boston University, the documents for establishing a formal cooperation agreement with Embrapa have been submitted for analysis and approval.
- I have helped Fabio Farinosi to link to persons and institutions in Sao Paulo, Brazil that are relevant of the development of his research on *Flood risk mitigation in Brazil: The impact of climate and land use change*.
- I have also helped Yosef Manik to establish collaboration with Marcos Ene, Embrapa representative in the Brazilian Palm Oil Commission and leader of the National Research Portfolio on Palm Oil for the development of his research *Toward sustainable palm oil biodiesel: Advancing a sustainable pathway by understanding the complex dynamics of its supply chain*.
- I have helped link Fabio Pereira with researchers at Embrapa to provide him access to Brazilian soil and climate databases for his research.
- I and fellow Rachael Garrett have discussed issues and contributed with ideas and perceptions to the research being collaboratively developed by fellows Eunjee Lee, Fabio Farinosi and Fabio Pereira.

**Principal collaborators outside Harvard:**

- Bernardo B. N. Strassburg - International Institute for Sustainability, Rio de Janeiro, Brazil
- Agnieszka E. Latawiec - International Institute for Sustainability, Rio de Janeiro, Brazil
- Geraldo Bueno Martha Junior – Embrapa – Agropensa – Brasilia, DF, Brazil
- Steve Vosti – University of California, Davis, CA
- Msangi Siwa – IFPRI – Washington, DC.
- Carlos Mauricio S. de Andrade – Embrapa Acre, Brazil
- Eufra Ferreira do Amaral - Embrapa Acre, Brazil
- Gisell M.L. de Assis – Embrapa Acre, Brazil
- Jeffrey Holle - University of California, Santa Barbara, CA
- Marianne Schmink - University of Florida, Gainesville, FL
- Jeffrey Needell – University of Florida, Gainesville, FL

**If you are moving to a new position, please list your contact information there:**

Embrapa Acre  
 Rodovia BR-364, km 14, Caixa Postal 321  
 Rio Branco, AC - Brasil - CEP 69900-970  
 Phone: +55 (68) 3212-3200 / 3212-3239  
 E-mail: [judson.valentim@embrapa.br](mailto:judson.valentim@embrapa.br)  
 Webpage: <http://www.cpaafac.embrapa.br/>