

CURRICULUM VITAE

Roger D. Norton

Research Professor of Agricultural Economics and
Regional Director for Latin America and the Caribbean, Borlaug Institute for International
Agriculture
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1. Addresses and contacts

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2. Education

Ph.D., economics, The Johns Hopkins University, Baltimore, Maryland, 1971.

B.A., mathematics and economics, Reed College, Portland, Oregon, 1963.

3. Summary of Professional Experience

Main thrusts of professional work

Currently directing multiple international agricultural projects for the Borlaug Institute at Texas A&M University, including strengthening coffee resilience in Honduras, Guatemala and El Salvador; the beef and dairy value chain in the Dominican Republic; a worldwide project for analyzing agricultural value chain issues in ten countries in Asia, Africa and Latin America; and a private sector-funded project for food safety in Latin America. Teaching a graduate course on international agricultural development policy.

Research and teaching experience on agriculture and rural development, competitiveness evaluation and development, market-led and export development, land tenure, poverty alleviation policies, and institutional issues; the economics of natural resources and the environment, with emphasis on water and forest management; programs for rural poverty alleviation; macroeconomic analysis and policy; quantitative modeling including mathematical programming; evaluation of investment programs. Author or co-editor of six books on modeling, agricultural development policy, and competitiveness analysis. Policy advisory work, project development and implementation, and strategic and economic analysis in forty-nine developing countries including facilitation of participatory national strategies and policy efforts for agriculture and natural resource management and at the economy-wide level, with private sector and civil society groups as well as with governments. Currently developing and overseeing Latin American projects for the Borlaug Institute for International Agriculture as well as teaching a graduate course at

Texas A&M University.

Team leader, chief of party, and principal advisor for a number of projects, including for development of productivity, competitiveness and trade capacity. Experience in interpreting and writing up the results of research projects and supervising work of team members and students, and in proposal development. Experience in negotiating national economic policy reform and developing legislation for policy implementation. Facilitation of international partnerships for agricultural development.

Principal policy advisory projects have included:

- Estonia, strategy for agriculture, water, fisheries and forest management (key sections converted into new legislation by the Estonian Parliament).
- Mozambique, a national development strategy for all sectors, approved by Parliament.
- Guyana, a national development strategy for all sectors, approved by Parliament.
- Eritrea, national strategy for agriculture and natural resource management
- Yemen, an analysis of national water policies submitted to the Cabinet.
- Honduras, as Chief of Party for a USAID project, facilitated development of an agricultural sector strategy and policy reforms that were passed into law by the Honduran Congress.
- Rwanda, agricultural development strategies approved by Government and used to coordinate donor inputs.
- Nicaragua, a national agricultural and forest management strategy developed with the private sector.
- Jordan, report on water management and policy issues for agro-export development.
- El Salvador, development of policy recommendations for Minister of Agriculture on land tenure, agricultural tariffs, and agricultural facility privatization. Chief of Party for an environmental management project.
- Colombia, analysis of competitiveness and policies to support competitiveness for several dozen crops and forestry species.
- Headed an FAO panel to evaluate all of its policy-related projects worldwide.

Research on agricultural competitiveness evaluations includes two comprehensive studies in Colombia, both using the DRC methodology and one also using PSE calculations and the other also using value chain analysis; one study each with DRC methodologies in El Salvador, Honduras and Mexico; and a study in Rwanda based on value chains. In addition, Dr. Norton served as international advisor to the Panamanian Government on the development of two programs for strengthening competitiveness and agricultural exports, with funding from the World Bank and Inter-American Development Bank and oversaw implementation of agricultural components of the Inter-American Development Bank project.

Prior to more direct involvement in development policy work, experience as full professor of economics (University of New Mexico), visiting adjunct professor of agricultural economics (Oklahoma State University), director of a research division (World Bank), and visiting professor at the Universities of Rome and Naples and INCAE in Costa Rica. Six books published along with numerous articles and research reports. These publications have been issued in eight languages.

Professional roles and recent experience

Currently teaching and facilitating international partnerships and projects for agriculture and carrying out research on agricultural value chains and competitiveness. Collaborated on a successful proposal for a sub-

contract for agricultural value chains in the Dominican Republic and currently preparing action plans for implementation of that component. Led teams for competitiveness studies in Colombia (on two occasions), Rwanda and El Salvador in recent years, and for policy reforms for agricultural competitiveness and improved water management in Jordan. At the request of the Ministry of Agriculture and Livestock Resources in Rwanda drafted a national agricultural strategy (Strategic Plan for Agricultural Transformation) and four years later drafted an updated, expanded version.

Past teaching at both graduate and undergraduate levels, with a tenured professorship in economics at the University of New Mexico and an adjunct professorship at Oklahoma State University. Studies and advisory work carried out in developing countries in all regions plus Italy, Canada and the United States. Research management experience as team leader and international coordinator for field studies and as a World Bank Division Chief. Four years of direct hire experience with USAID, ten years with the World Bank (research division chief), plus extensive advisory and consulting work for USAID, the FAO, the World Bank, the Inter-American Development Bank, the U.N. Development Program, the Inter-American Institute for Agricultural Cooperation, the Asian Development Bank, ASEAN, the Secretariat for Economic Integration in Central America, The Carter Center, and the U.S., Mexican, Italian and Canadian Governments. Many studies carried out in close collaboration with national counterparts in the respective countries. Fluent in Spanish, reading ability in Portuguese and French.

In addition to teaching and work on development projects at Texas A&M and the policy advisory work, recent (2005-2017) experience includes:

- Author of *The Competitiveness of Tropical Agriculture, A Guide to Competitive Potential with Case Studies*, Academic Press (2017).
- Author of *Agricultural Development Policy: Concepts and Experiences*, reviewing examples in 80 countries (Wiley, 2004).
- McCarl, B., R. Norton and X. Wu. *Assessing climate change effects of IDB projects: concepts and procedures*. C. E. Ludeña and L. Sánchez-Aragón (eds). Inter-American Development Bank, Monograph No. 317. Washington DC. (2015).
- Author of "Policy Frameworks for International Agricultural and Rural Development," in the *Encyclopedia of Agriculture and Food Systems*, Elsevier (2014).
- Author of study on agricultural special economic zones in Central America, for the Inter-American Development Bank (2012).
- Co-author of a research study on obstacles to development of agriculture in Belize, published in an edited volume by the Inter-American Development Bank (2010).
- Co-author of a study on strengthening of value chains for fruit and vegetables in Rwanda (2009).
- International advisor for formulation of projects on productivity and competitiveness for market-led development in Panama, working with a Panamanian team. Modernization of the public agricultural sector is a key part of this work (2006-2008).
- Led a team for the detailed evaluation of the competitiveness of more than 50 non-traditional agricultural and forestry products, by location within the country, in Colombia (2006-2007). This followed an earlier study in Colombia on the competitiveness of both traditional and non-traditional agricultural products.
- Headed a team to advise USAID/Jordan on recommended policy reforms for more efficient use of water resources and greater agricultural export competitiveness and rural labor market reforms in that country, and a background paper for design of a new project (2006)

- Headed a design team for a new USAID project for watershed and biodiversity management in Panama (2006).
- Responsible for the agricultural sector chapter of a World Bank public expenditure review in Panama (2005-2006).
- Assisted The Nature Conservancy (Panama office) in developing a successful proposal for GEF funding for strengthening Panama's management of protected areas (2005).
- Served as moderator in a Carter Center international forum on development cooperation (December 2005).

The book *Agricultural Development Policy: Concepts and Experiences*, reviews agricultural strategies and policies, including water management, research and extension, land tenure, and rural development issues (John Wiley and Sons). The book places experiences in 80 countries in a consistent conceptual framework for policy issues and evaluates what approaches have been most successful. It has been translated into Spanish, French, Arabic and Chinese.

Advised the Peruvian Government on approaches to agricultural policy reform (2004). Served as principal international advisor to a participatory process of formulating a national development strategy for Mozambique (2002-2004); the strategy was endorsed by the country's President and approved by its Parliament.

Developed a program of training courses and policy assistance in agriculture and natural resources for three countries in the Caribbean basin (Suriname, St. Lucia, Bahamas) in 2003-2004. Lectured in a workshop on national water management policies for Central Asian countries (in Kazakhstan) in 2001, and carried out analyses of agricultural policy and water management in Yemen in 2001-02 (and in 1995-96). In 2002 prepared policy briefs for international distribution by FAO on land tenure policies, water management policies, agricultural technology policies, rural finance policies, gender issues in agricultural development, and agricultural development strategies.

Addressed an earlier Carter Center's Development Cooperation Forum on issues of participation and ownership with respect to national development strategies (February, 2002). Advised the Carter Center on the development of its framework paper "The Approach of the Carter Center's Global Development Initiative for National Visions and Strategies" (July-August 2004). Lectured on trade-related policy issues to participants from eight countries in Latin American in a trade negotiation workshop in Panama (2003). Gave workshop presentations on participatory approaches to development policy and strategies for Eastern Caribbean States (in St. Lucia, July, 2000) and for the Central American Council of Ministers of Agriculture (meeting in Panama, Nov. 2000).

Designed a USAID project for private sector development of an agricultural and forestry strategy for Nicaragua, and served as principal international advisor for that project, working closely with leading representatives of the farming and forestry sectors (in 2000-2001, with IICA (under USAID funding). Prior to that served as principal advisor for the policy component of an institutional strengthening program for the Ministry of Agriculture and Forestry in Nicaragua, with a concentration on development of a national forestry policy, a national rural development policy, and analysis of options for agricultural pricing policies (program sponsored by the Inter-American Development Bank). International Coordinator for an FAO-sponsored advisory project in Estonia for developing a national strategy for agriculture, forestry, fisheries and water management, in the late 1990s. In that capacity, worked closely with the leadership of the

Ministry of Agriculture and ten national task forces of experts staffed largely by Estonian academics. Also advised the Estonian Parliament on legislation for implementing the strategy.

In 1995-1996 and again in 1998-99 served as Carter Center Team Leader for the participatory development of a national economic strategy in Guyana. In 2000, worked with the Office of President in Guyana on the implementation program for that Strategy. The first round of that work involved organizing the contributions of technical working groups, composed of government and non-government personnel, for 23 sectors and topics, including natural resource sectors and agriculture. After the first draft was issued for public discussion, the work was suspended owing to a political crisis in the country. It was initiated again in 1998 and carried to completion with an even stronger role for Guyanese civil society.

Co-authored a comprehensive set of proposals for agricultural policy reform for El Salvador in late 1998 and early 1999, at the request of the Salvadoran Foundation for Economic and Social Development (FUSADES). Developed an analysis of the legal and institutional obstacles to the sustainable development of the Darien in Panama (Inter-American Development Bank, 1998).

Helped develop and negotiate the official agricultural policy programs for El Salvador (1989-1994) and Honduras (1990-1994). As head of a policy advisory team in Honduras served as advisor for four years to the Minister of Natural Resources and led the work that produced what is considered to be the most comprehensive agricultural policy law in Latin America, plus seven complementary laws, the accompanying regulations, and other technical and implementation documents for reforms in agricultural trade and pricing policy, land tenure issues and agrarian reform, forest management, the agricultural financial sector, and other areas. A noteworthy feature of this work was the facilitation of a national consensus in support of the laws among peasant organizations and commercial farmers' groups that for decades had been in violent conflict with each other. It required guiding more than 100 workshops and meetings with representatives of national organizations of peasant farmers and of commercial farmers, as well as other groups in society. Co-authored USAID sector and country strategies for Honduras.

Close collaborative work based on residence or repeated visits with economic policy advisory and project development groups (staffed by national personnel) in the following countries: Eritrea, Peru, the Dominican Republic, Mexico, Honduras, Nigeria, Egypt, South Korea, Guyana, Estonia, Nicaragua, Mozambique, Colombia, Panama and El Salvador, and briefer working relationships with such groups in a number of other countries.

Research experience

Six books and three monographs published, including the above-mentioned books on competitiveness and agricultural development policy and a state-of-the-art text in agricultural programming models, plus many professional papers. Assisted the Mexican Government in developing the longest-serving agricultural model in developing countries. Agricultural studies and publications have concerned competitiveness evaluations, pricing and trade policy, structural adjustment issues, linkages between macroeconomic and agricultural policy, agricultural fiscal policy, credit policy, investment programs, irrigation management, fertilizer distribution, concessional food aid, livestock development, forestry management, agricultural models, and other topics.

Developed and published models (econometrics, optimization and simulation), analyses based on simpler

numerical techniques, and qualitative assessments. Authored economic program documents, including the country development strategies for USAID/Korea and USAID/Panama, a five-year plan for Korea, an agricultural development strategy for USAID/Honduras, the agricultural strategy of the first post-civil war Government and subsequent Governments in El Salvador, World Bank sector reports for Haiti, the Dominican Republic, Nigeria, Turkey, Colombia, Honduras and Mexico, agricultural policy documents for the Mexican Government, a design for a policy research program for ASEAN's Agricultural Development Planning Center, and concept papers for technical assistance in the area of policy analysis for the Inter-American Institute for Agricultural Cooperation, the Inter-American Development Bank, and USAID/Honduras.

Research and policy experience in resource and environmental economics includes analyses of: forest management policies in Honduras, Nicaragua, Eritrea, Estonia, and Guyana; fisheries policies in El Salvador, Estonia and Guyana; irrigation management programs in Mexico, Egypt and Peru; rural environmental policies in El Salvador and Eritrea; national water management in Yemen; a nuclear waste isolation program in the U.S.; U.S. Forest Service planning methods; measurement of damages from air pollution in the U.S.; the socio-economic effects of earthquake forecasts in Peru; and the potential of geothermal energy for space heating in the U.S.

Teaching experience

Teaching experience at the University of New Mexico (full professor); Oklahoma State University (adjunct professor) in the areas of macro and micro economic theory, quantitative methods, natural resource economics, environmental economics, and agricultural modeling; and University of Naples, mathematical modeling. Extensive lecturing in short courses on modeling, agricultural policy analysis, and water management: for USAID officers; at universities in Mexico, Estonia, Peru, Honduras, Costa Rica, the Dominican Republic, Jordan, Indonesia, Thailand and Italy; at government and international institutions in Peru, Mexico, Nigeria, Thailand, Egypt, Turkey, Chile, Honduras, Nicaragua, Kazakhstan, South Korea, Mozambique, Eritrea, Panama, St. Lucia and El Salvador; and for the FAO, the Inter-American Institute for Agricultural Cooperation, the Secretariat for Economic Integration in Central America, the World Bank's Economic Development Institute, the Inter-American Development Bank, and INCAE.

Graduate courses taught:

International Agricultural Development Policy	Texas A&M University	2013, continuing
Environmental Economic Theory	Univ. of New Mexico	1979-86, 4 times
Topics in Env. and Natural Resource Economics	Univ. of New Mexico	1979-86, 3 times
Mathematical Modeling for Agriculture	Oklahoma State University	1985, 1 time
Mathematical Models of the Economy	University of Naples, Italy	1984, 1 time

Ph.D. students supervised:

Keith Willett	Univ. of New Mexico	Ph.D.	Economics
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Robert Patrick	Univ. of New Mexico	Ph.D.	Economics
Ross Thomas	Univ. of New Mexico	Ph.D.	Economics
Rafael Celis	Univ. of New Mexico	Ph.D.	Economics
Seok Hyun Hong	Stanford University	Ph.D.	Economics
Hunt Howell	University of Pennsylvania	Ph.D.	Economics
Nicole Ballenger	Univ. of California, Davis	Ph.D.	Economics
Rob Schipper	Wageningen University	Ph.D.	Economics

4. Employment History

- June 2009 to Present** Texas A&M University: Currently Regional Director and Coffee Center Director, Borlaug Institute for International Agriculture, and Research Professor in Agricultural Economics.
- 1995-2009** Economic consultant, advisor, researcher and author (see specific activities below).
- 1995-2005 (part time)** Senior Economic Policy Advisor to The Carter Center's Global Development Initiative, involving assignments in Guyana, Mozambique and Mali (see below).
- 1994** Chief of Party, PROMESA Project (Environmental Protection for El Salvador), USAID. Analysis, design and implementation of environmental policies.
- 1993-1994** Consultant in agricultural policy, with work on agricultural strategies in Dominican Republic, Honduras, El Salvador and Mexico (see specific assignments below).
- 1989-1993** Sr. Agricultural Policy Advisor and Chief of Party of the Agricultural Policy Analysis for Honduras (APAH) project, under contract with USAID. Analysis, design and implementation of agricultural policies, particularly in the areas of agricultural pricing, trade and marketing policies, land tenure, rural credit, and forest management.
- 1983-1990** Adjunct Professor of Agricultural Economics, Oklahoma State University. Research and short course in quantitative methodologies.
- 1986-1989** Consultant and advisor in agricultural policy analysis. Work in El Salvador, Peru, Indonesia, Jordan, Honduras, Dominican Republic, Barbados, Egypt, Italy, Malaysia, Thailand, Philippines, Brunei, supported by USAID, FAO, the World Bank, the Italian Government, and ASEAN and the UNDP, plus topical studies for the FAO, IICA, and the U.S. Department of Agriculture.
- 1979-1986** Professor of Economics, University of New Mexico. Taught courses, advised Ph.D. students and carried out research in the fields of the economics of natural resources and the environment and mathematical modeling. Country research and advisory work in the U.S., Mexico, Egypt, Colombia, Turkey, Nigeria, Haiti, Guatemala, South Korea, Thailand, Italy, supported by the U. S. Department of Energy, the U. S. Congress, the Mexican Government, the World Bank, SIECA, and the Government of Italy.

- 1969-1979** World Bank, including:
- Residence in Mexico City, 1972-74, as advisor to the Ministry of the Presidency on agricultural planning models and policy planning
- Chief, Development Planning Division, Development Research Center, 1974-79
- 1965-1969** USAID, as program economist, including:
- Residence in Seoul, Korea, 1965-68, participating in the development and application of Korean planning models.

Additional professional and community roles

Member of the Board of Directors, St. Aidan Montessori School, Washington, D. C., 1976-78.
 Founder and editor, 1981-85, of The Southwestern Review of Management and Economics
 Member, Technical Advisory Group, PROWID, International Center for Research on Women. 1997-2000.
 President, Board of Directors, Uraba Condominium, Panama, 2008-2009.
 Member, Board of Directors, Tiffany Park Homeowners Association, Bryan, Texas 2015-2017

5. Awards

1. Honors at entrance, Reed College, 1959
2. Woodrow Wilson Graduate Fellowship, Johns Hopkins, 1963-64
3. Woodrow Wilson Doctoral Fellowship, Johns Hopkins, 1965-66 (declined)
4. The 1973 Lanchester Prize was awarded to a volume to which I contributed seven chapters: L. Goreux and A. S. Manne, editors, Multi-level Planning: Case Studies in Mexico, North-Holland Publishing Company, 1973.

6. International Experience

The Dominican Republic, 1985-1988, 1993, 1994, 2016

Initiating a USDA-funded project on value chains, for the beef and dairy components.

Developed a workshop on agricultural policy analysis and then a model of the coffee sector, for USAID and the Dominican Agricultural Policy Analysis Unit.

Carried out an analysis of agricultural pricing policy and comparative advantage for the World Bank.

Advised on development of a sector-wide agricultural policy and the process of consensus building for it (for a project sponsored by the UNDP).

Guatemala, 1977-1980, 1983-1984, 2013-2015

Development of proposals with Guatemala partners for assistance to cardamom producing sector.

Development, with a SIECA team, of a model for measuring the effects of increased intra regional trade in Central America.

Mexico, 1969-1985, 1994, 2015

Presentation to conference sponsored by the Government of Yucatán on agricultural effects of climate change.

Advisor to the Ministry of the Presidency on the development and implementation of agricultural models and on agricultural policy, on a visiting basis then in a resident post through the World Bank and later as a private consultant.

Advisor to the Barros Sierra Foundation on the development of a multi-sectoral model for perspective planning.

Prepared a sectoral assessment, with projections, for the FAO. Carried out a review of public sector investment for the World Bank.

Organized the U.S.-Mexico Workshop on Agricultural Trade, Pricing Policy and Resources, for Stanford University and the Mexican Government, held at Santa Fe, New Mexico, Aug. 1983.

Authored the policy chapter of an FAO-sponsored document on agricultural and irrigation policy (1994).

Qatar, 2014

Team member from the Borlaug Institute exploring agricultural project options for Qatar.

Haiti, 1984, 2014

Development of proposal with partner organizations for assistance to Haitian agricultural research and extension services.

Study of comparative advantage and agricultural fiscal policy, for the World Bank.

Mexico, El Salvador, Costa Rica, Panama and Brazil, 2010-2012

Facilitated research and teaching partnerships for Texas A&M faculty in several disciplines, in these countries.

South Africa, 2012

Development of ties between the University of Johannesburg and Texas A&M University.

Belize, 2009

Author of a comprehensive study on the obstacles to agricultural development in Belize, by commodity, including production and marketing issues and policy issues.

Rwanda, 2008-2009, 2012

International advisor for reformulation of the national agricultural development strategy in Rwanda, taking into account macro policy, donor projects and policies, and field experience with agricultural projects (for DFID/IFAD). Developed a package of projects costed at more than \$650 million and negotiated their acceptance by international donors, on behalf of the Ministry of Agriculture. Developed new version of this national strategy (PSTA III) in 2012.

Co-author of extensive study of issues in agricultural value chains for a large number of fruits and vegetables.

Panama, 1986-1987, 1998, 2003, 2005-2008

International advisor for investment projects for improving productivity and competitiveness in the context of market-led export development and institutional reforms (2006-08).

Team leader for design of a watershed management project for USAID (2005-2006).

Development of the public expenditure review in the agriculture and rural development area, for the World Bank (2004-2005).

Advisory assistance to The Nature Conservancy (Panama office) in their formulation of a GEF project for strengthening management of protected areas (2005).

Lecturer in a workshop with participants from eight countries on agricultural policy and agricultural trade negotiations (2003).

Prepared a review of legal and institutional obstacles to the sustainable development of the Darién (1998).

Advised USAID on their program development and worked on their country development strategy paper (1987).

Assisted a USAID-supported policy advisory team in their development and interpretation of an agricultural data bank and their development of policy papers (1986-87).

Reviewed a draft of Panama's five-year agricultural plan (1986).

Colombia, 1984-85, 2002-03, 2006-07

Team leader for the assessment of the competitiveness of over 50 agricultural and forestry products by locality in Colombia (2007), using both quantitative and value-chain analyses. Resulting study scheduled

for publication in Colombia (in Spanish).

Participated in a team designing a successful proposal for a USAID project (2005), leading development of the policy component of the proposal.

International Coordinator for a team of nine persons carrying out a study of the competitiveness of Colombian agriculture, for the World Bank and the FAO (October 2002 to April 2003).

Participated in a study on the structure of the agricultural sector and rural financial markets, for the World Bank, carrying out econometric and other analyses of rural financial issues (1984)

Jordan, 1986, 2006

Team leader for analysis of agricultural policy options, with emphasis on agro-export development and national water management policies, and a project design background paper for USAID/Jordan (2006).

Lectures in a workshop on the CAPPA system for agricultural planning, University of Jordan, sponsored by the FAO and USAID (1986).

Costa Rica, 1982, 1987-88, 1995, 1999, 2006

As Visiting Professor at INCAE gave lectures on national water management policies and irrigation policies for mid-career participants from nine countries in Latin America (2006).

Drafted, at IICA's request, a paper on the challenges facing agricultural policy in Latin America (1999).

Carried out research on economic modeling of agriculture and environmental effects, with the University of Wageningen. Participation in an international seminar on that work in Turrialba, Costa Rica, in February of 1999.

Participated in an IICA workshop on agricultural risk and crop insurance. Developed training materials for IICA regarding the relations between macroeconomic policy and agricultural policy.

Eritrea, 2000, 2004-2006

Co-leader of a workshop on agricultural policy analysis for senior officials (FAO, 2000). International advisor on participatory development of a national strategy and policy framework for agriculture and natural resources (2004-2006).

El Salvador, 1983-84, 1987-89, 1993-94, 1998-99, 2004

Advisor to the Secretariat for Economic Integration in Central America, on techniques of project appraisal (1982).

Mid-mission reviewer of a USAID-supported agricultural policy inventory (1987).

Carried out a study for USAID on food import policies, including quantification of the effects of macro policies on agricultural production and imports (1988).

Headed a Salvadorean team to design a new agricultural policy framework for the country (via FUSADES), which was adopted and implemented by the Cristiani Administration (1988).

Advisor to USAID/El Salvador on macroeconomic policy (1989).

Co-author with FUSADES on a new strategy for agricultural policy (1993-94).

Chief of Party, project for rural environmental policies, supported by USAID, 1994.

Gave the invited international address to the Second National Forum on Agricultural Policy, 1998. Developed proposals for reform of the National Agricultural College (supported by the World Bank), 1998.

Co-author of recommendations for agricultural policy reform, emphasizing the linkages between macroeconomic policy and agricultural policy, with emphasis on trade policy, agricultural extension, fiscal policy and exchange rate policy, FUSADES, 1998-99.

Led a quantitative analysis of competitiveness of various products in Salvadorean agriculture (FUSADES, 2004).

Participated in the preparation of a proposal for a USAID-funded project (2006).

Peru, 1981, 1984-1988, 2004

Developed a model for investment choice in agriculture for the Inter-American Development Bank and the Peruvian Government (1981).

Led a study of the socio-economic effects of earthquake forecasting for the U.S. Geological Survey (1981).

Carried out advisory work on agricultural policy analysis and model development, for the Peruvian Ministry of Agriculture's Policy Analysis Group (through USAID) (1984-88).

Drafted recommendations for the Ministry of Agriculture on processes and issues for formulating a new national agricultural strategy, in light of the anticipated signing of new international trade agreements (2004).

Suriname, St. Lucia, and The Bahamas, 2003-2004

Consultations and preparation of a training program in policy analysis for agriculture and natural resource sectors and for the investment project cycle, for FAO at the request of the participating governments. (See below for earlier work in St. Lucia.)

Mozambique, 1997, 2002-03

International Advisor, providing lectures and discussions of participatory approaches to formulating national development strategies and the content of such strategies, with the government and now with leading groups in civil society and the private sector in support of their development of a national strategy (continuing program on behalf of The Carter Center).

At the request of the Mozambican strategy group, wrote a review of the T21 class of economic projection models, in the context of other models for economic development strategizing (October 2002).

Yemen, 1995, 2001-02

Analysis for developing macroeconomic policies for water management, in conditions of rapidly increasing water scarcity, with the World Bank, the UNDP, the Government of Holland, and the Yemeni Government.

Study on the role of *qat* in the Yemeni economy, and its implications for water policy, with FAO and the Yemeni Government.

Kazakhstan, 2001

Lectures on the economics of water management at a training course for participants from six Central Asian countries, held in Almaty, Kazakhstan, September 2001 (under sponsorship of FAO, UNDP, and the International Fund for Saving the Aral Sea).

Nicaragua, 1995, 1997-2001

Advisor to the Council of Ministers for Agriculture and Natural Resources, and their technical staff, in the development of a national strategy for agriculture and forest management. Work supported by the Inter-American Development Bank and the U. N. Development Program (1995).

Advisor on the formulation of an investment program for rural development with emphasis on participation of rural communities in project design and screening (with the Inter-American Development Bank, 1997).

Advisor to the Minister of Agriculture and his staff on a program of policy development and institutional strengthening, supported by the Inter-American Development Bank (1998 to 2000). As part of this work, evaluated a draft Forestry Law and assisted in development of a national forestry policy and a national rural development policy.

Principal international advisor for participatory formulation of a national strategy for agricultural and rural development, working closely with leading representatives of the agricultural and forestry sectors (IICA and USAID, 2000-2001).

Participated in a team designing a proposal for a USAID project (2004-2005); the project was cancelled prior to award because of funding cuts.

Guyana, 1995-96, 1998-2000

As Carter Center Team Leader, advisor first to the Minister of Finance and then to a national civic committee in guiding a participatory effort to formulate a National Development Strategy with considerable supporting detail in all economic and social sectors. Work supported by a consortium of international donors, including USAID, the World Bank, the Inter-American Development Bank, and the Carnegie Foundation, through the Carter Center. This work was interrupted due to an electoral crisis but a national committee of civil society representatives brought it to completion and presented the Strategy to the Government, which forwarded it to Parliament, in June of 2000. Worked with the President of Guyana and his principal advisor in late 2000 in developing components of the implementation program for this Strategy.

Honduras, 1980-84, 1986-1988, 1989-1993, 2000

In addition to the above-mentioned resident work on agricultural policies during 1989-93:

Advised on agricultural and food policy studies to the Secretariat for Economic Integration in Central America.

Carried out an in-depth analysis of food and agricultural policy for the U.S. Department of Agriculture and USAID, including estimates of nutrient availability and the distributional effects of policy. Carried out studies on PL 480 import policy and other policy issues for USAID. Drafted an agricultural strategy paper for the USAID Mission.

Co-author of the agricultural chapter of a World Bank country Economic Memorandum on Honduras (1993).

Advised the Inter-American Development Bank country team on the formulation of a rural development program, including both investment and policy components. The investment projects are to be designed and implemented in a participatory way, involving rural communities (May, 2000).

Thailand, Cambodia, Laos, Bangladesh, 2000

Participated in the FAO's first worldwide evaluation of its policy support work, analyzing the policy projects in this sample of four countries in Asia. (See below for earlier work in Thailand and Bangladesh.)

Bolivia, 2000

Advisor to the Ministry of Agriculture, Livestock and Rural Development on the establishment of a unit for agricultural policy analysis and implementation, and the strengthening of the Ministry's capacity in those areas (FAO).

Mali, 1997-1998

Participation in development of recommendations for participatory approaches to formulating national development strategies, on behalf of The Carter Center.

Estonia, 1996-97

FAO Team Leader for development of a National Agricultural Strategy, working closely with ten national task forces comprising experts from the Estonian Government and Estonian universities. Advisory work with officials of the Ministry of Agriculture and the relevant Commission of the Estonian Parliament on the development of legislation for implementing the Strategy.

Ecuador, 1991

Guided a study tour of Honduran officials and farm representatives to review agricultural banking institutions.

Barbados, St. Lucia and St. Vincent, 1988-89

Reviewed an agricultural development program for the Eastern Caribbean Economic Community, for USAID.

Developed a project paper for USAID for a tropical fruit export project for the Eastern Caribbean states.

Presentation on participatory approaches for development strategies and policies, at a workshop for nine Eastern Caribbean States, St. Lucia, July 2000, sponsored by PriceWaterhouseCooper and DFID.

Indonesia, 1986-1987

Advised an effort in agricultural sector modeling at the Gadjah Mada University (through the UNDP).

Reviewed Indonesian policy research priorities for an ASEAN program (see below).

Italy, 1984-86

Served Visiting Professor (on sabbatical) at the Universities of Rome and Naples.

Developed a model of Italian agriculture for reviewing the effects of EEC policies on Italy.

Prepared a methodological paper on quantitative modeling for the Italian National Research Council.

Malaysia, Thailand, Indonesia, Philippines, Brunei, Singapore, 1986

Visited all ASEAN countries to review their priorities for agricultural policy research and then developed a research agenda for ASEAN's Agricultural Development Planning Center.

Egypt, 1975, 1982-83, 1985-86

Lectured in an FAO workshop on agricultural policy analysis.

Carried out studies and advisory work on a model for evaluation of irrigation investments throughout the country, for the UNDP, the World Bank, and the Egyptian Ministry of Irrigation.

Thailand, 1977, 1986

Lectures and advisory work on an agricultural sector model (World Bank and Ministry of Agriculture). Review of policy research priorities for ASEAN (see above).

Turkey, 1984, 1985

Development of an agricultural sector model and a model of fertilizer transport and distribution, for the World Bank and the Turkish Government. Advisor to the Turkish Government on implementation of the fertilizer model.

Nigeria, 1982-1984

Studies of agricultural pricing policy and trade, and development of a model to measure the effects of tariff and exchange rate changes, for the World Bank and the Nigerian Government.

Advisory work with SIECA on methods of project appraisal.

South Korea, 1965-1968, 1977-1981

Advisor on development of macroeconomic, multi-sectoral and multi-regional models, for USAID and the Korean Economic Planning Board.

Advisor to the Korea Development Institute and the Korean Institute of Energy and Resources on macroeconomic, multi-sectoral and energy models (via the World Bank and the Asian Development Bank).

Chile, 1978

Evaluation of a program of quantitative agricultural policy analysis, for the World Bank and the Ministry of Agriculture.

Tunisia, 1975-1976

Advisor on agricultural sector models (via the FAO).

Canada, 1974-1976

Advisor on the development and application of agricultural sector and sub-sector models, for Agriculture

Canada.

Pakistan and Bangladesh, 1969

Study on interregional resource transfers, between what was then East Pakistan and West Pakistan, for USAID.

7. Resource and Environmental Studies

1979-1981	Socio-economic analyses of a proposed nuclear waste isolation plant (U. S. Department of Energy, New Mexico Department of Energy and Resources)
1979-1980	Evaluation of the program planning methods of the U. S. Forest Service (U. S. Senate Committee on Energy and Natural Resources)
1980	Measurement of soiling damages from air pollution (U. S. Environmental Protection Agency).
1981-1983	Assessment of the socio-economic effect of earthquake forecasts in Peru (U. S. Geological Survey)
1982	Assessment of the economic potential of geothermal energy for space heating (Los Alamos National Laboratory)
1982-1983	Study of price formation in the U. S. uranium concentrates market (University of New Mexico)
1984-1985	Advisor on methodologies of forecasting electricity demand by service area and sector in New Mexico (New Mexico Public Service Commission)
1982-1986	Analysis of irrigation investment options in Egypt (World Bank, UNDP, Ministry of Irrigation)
1990-1992	Co-author of policy studies and legislation for forestry management in Honduras; the legislation was approved in 1992 (USAID).
1994	Coordinating environmental policy initiatives in El Salvador, for reforestation, cleaning up agroindustrial wastes, fisheries management, and protecting natural reserves (USAID).
1995	Invited analysis of draft forestry legislation in Nicaragua, for the Ministry of Natural Resources (IDB and UNDP).
1995	Macroeconomic policies for water management in Yemen (World Bank).
1995-96	Reviews of draft policy analyses on forestry and fisheries in Guyana, and

development of recommendations for the Minister of Finance for improvement of those drafts (The Carter Center).

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| 1996-97 | Reviews of draft policy analyses for the forestry and fisheries sectors and water management and the impact of agriculture on the environment, in Estonia, and development of recommendations for the Government for improvement of those drafts (FAO) |
| 1998 | Review of legal and institutional obstacles to the development of the Darién region of Panama (for GEA Consultores and the Inter-American Development Bank). |
| 1999 | Provided the Nicaraguan Government with a formal review of a further draft of forestry legislation; assisting in development of new forestry legislation. |
| 2001-02 | Study of the role of <i>qat</i> in the Yemeni economy and its implications for water management. |
| 2004-2005 | Principal advisor to the development of chapters of a national strategy on water and soil management and forest and wildlife management in Eritrea. |
| 2005 | Co-author of a successful GEF project proposal for strengthening management of protected areas in Panama. |
| 2005-2006 | Team leader for the design of a new watershed management project in Panama (for USAID). |
| 2006 | Co-author of a study for USAID/Jordan on agricultural policies with emphasis on water management policies and agro-export policies. |
| 2008 | Analysis of watershed management policies and development of programs for their improvement, as part of an overall agricultural development strategy development for Rwanda and negotiated with donors. |

8. Publications

A. Books

The Competitiveness of Tropical Agriculture, A Guide to Competitive Potential with Case Studies, Academic Press, 2017.

Competitiveness of Agricultural and Forestry Products in Colombia (in Spanish), USAID/Colombia and the Government of Colombia, two volumes, Bogotá, 2008.

Agricultural Development Policy: Concepts and Experiences, John Wiley & Sons, 2004.

The United States and Mexico: Agriculture and Rural Development (edited with C. Cartas, B. Johnston, and C. Luiselli), Stanford University Press, 1987.

Mathematical Programming for Economic Analysis in Agriculture (with P. B. R. Hazell), Macmillan Publishing Company, 1986. Later issued on CD by IFPRI in Washington, D. C.

The Book of CHAC: Programming Studies for Mexican Agriculture (edited with L. Solís), The Johns Hopkins University Press, 1983.

B. Monographs, Articles, Book Chapters and Conference Papers

McCarl, B., R. Norton and X. Wu. 2015. *Assessing climate change effects of IDB projects: concepts and procedures*. C. E. Ludeña and L. Sánchez-Aragón (eds). Inter-American Development Bank, Monograph No. 317. Washington DC.

"Policy Frameworks for International Agricultural and Rural Development," *Encyclopedia of Agriculture and Food Systems*, edited By Neal van Alfen, Elsevier, Oxford University Press, 2014.

"Agriculture Sector: Assessment and Priorities for Public Investment and Policy" (with John Horton), in *Towards a Sustainable and Efficient State: The Development Agenda of Belize*, edited by Dougal Martin and Osmel Manzano, Inter-American Development Bank, Washington, D.C., 2010.

"Development Cooperation Processes: Issues in Participation and Ownership," *Proceedings of the Development Cooperation Forum*, The Carter Center, Atlanta, Georgia, February 22, 2002.

"Critical Issues Facing Agriculture on the Eve of the Twenty-First Century," chapter 3 in: *Towards the Formation of an Inter-American Strategy for Agriculture*, Consortium for Planning and Coordination, Interamerican Institute for Cooperation on Agriculture (IICA), San José, Costa Rica, 2000 [original published in Spanish].

"Nueva Política para el Desarrollo Agropecuario de Nicaragua" (New Policies for Agricultural Development in Nicaragua), with Néstor Avendaño, in: Horacio Rose, ed., *Elementos para una Política de Desarrollo Rural, Transferencias para la Modernización del Campo (Elements of a Rural Development Policy, Transfers for Modernizing the Countryside)*, Programa Agrícola, CONAGRO/BID/PNUD, Ministerio de Agricultura y Ganadería, Managua, Nicaragua, 1998.

"Eesti riiklik põllumajanduse strateegia: eesmärgid ja alternatiivastsenaariumid" ("Estonian National Agricultural Strategy: Objectives and Alternative Scenarios"), in *Põllumajanduse ja Maaelu, Ülevaade 1996* (Agriculture and Rural Life, 1996 Review), Ministry of Agriculture, Tallinn, Estonia, 1997.

"Remarks on Guyana's National Development Strategy (Summary)," in *Toward a new Model of Development Cooperation: The National Development Strategy Process in Guyana*, The Carter Center, Atlanta, Georgia, May 1997.

"Response to Section C [of the Symposium]," pp. 237-47 in J. Bouma, A. Kuyvenhoven, B. A. M. Bouman, J. C. Luyten and H. G. Zandstra, eds., *Eco-Regional Approaches for Sustainable Land Use and Food Production*,

Proceedings of a Symposium on Eco-Regional Approaches in Agricultural Research, 12-16 December 1994, ISNAR, The Hague, Kluwer Academic Publishers and International Potato Center, Dordrecht, 1995.

Análisis de las Políticas para el Desarrollo Agrícola y Alimentario: Series de Datos Básicos y Su Utilización, 1994, Colegio de Posgraduados en Ciencias Agrícolas y Programa Italia/FAO/PROCAPLAN, the first in a monograph series for Latin America entitled *Políticas Agrícolas*, published in Mexico. Previously published in English as *Policy Analysis for Food and Agricultural Development: Basic Data Series and Their Uses*, Training Materials for Agricultural Planning No. 14, FAO, Rome, 1988.

"Un Enfoque Integral de Desarrollo Agrícola" [A Holistic Approach to Agricultural Development], in César Picón y Rodrigo Tarté, editores, *Ambiente y Desarrollo* [Environment and Development], UNESCO, the German Government, the Panamanian Ministry of Education and the Fundación Natura, Panama City, Panama, 1994, pp. 92-105.

Integration of Food and Agricultural Policy with Macroeconomic Policy: Methodological Issues from a Latin American Perspective, Economic and Social Development Papers, No. 111, FAO, Rome, 1992. [Issued in Spanish as well.]

"Perspectivas de la Investigación Económica sobre Puno" [Perspectives on Economic Research in Puno], *Perspectivas de la Investigación Agropecuaria para el Altiplano*, L. Argüelles and R. D. Estrada, eds., Centro Internacional de Investigaciones para el Desarrollo, convenio ACIDI-CIID-INIAA, Lima, 1991, pp. 193-207.

Las Políticas Macroeconómicas y la Agricultura [Macroeconomic Policies and Agriculture], with C. Pomareda, L. Reza, and J. Torres Zorrilla), Serie de Documentos de Programa No. 14, the Inter-American Institute for Cooperation in Agriculture (IICA), San José, Costa Rica, Sept. 1989.

Agricultural Development Policies in Honduras: A Consumption Perspective (with M. Garcia, M. Ponce and R. van Haften), special research publication of the Office of Nutrition Economics, U. S. Department of Agriculture, Washington, D. C., 1988.

"La Política Agropecuaria Peruana en la Coyuntura Económica Actual" [Peruvian Agricultural Policy in the Current Economic Context], in *Peru: El Problema Agrario en Debate*, F. Eguren, R. Hopkins, B. Kervyn y Rodrigo Montoya, editores, Universidad Nacional de San Cristobal de Huamanga, Lima, Peru, 1988. [Also published as Study No. 3 in: Serie de Estudios Económicos, GAPA, Ministerio de Agricultura, y MIAC, Lima, March 1988.]

Agricultural Issues in Structural Adjustment Programs, Economic and Social Development Papers No. 66, FAO, Rome, 1987.

"Un Modello Strutturale di Supply Response per l'Agricoltura Italiana" [A Structural Model of Supply Response for Italian Agriculture], with V. Santaniello, in *La Struttura Produttiva Agricola: Analisi, Rivelazione, Evoluzione*, Atti del XXII Convegno di Studi della Società Italiana di Economia Agraria, Istituto Nazionale di Economia Agraria, Rome, 1987.

"Portugal's Entry into the EEC: Aggregate and Distributional Effects Determined by Means of a General Equilibrium Model" (with P. L. Scandizzo and L. Zimmerman), *Journal of Policy Modeling*, vol. 8, no. 2, 1986.

"Optimization of Policy Goals in the Context of a Sector Model" (with N. S. Ballenger), *Agricultural Economics Research*, vol. 38, no. 2, 1986.

"The Socio-Economic Consequences of Earthquake Prediction: A Case Study in Peru" (with J. A. Echevarría and K. A. Norton), *Earthquake Prediction Research*, vol. 4, 1986.

"Sectoral Analysis of the Benefits of Subsidized Insurance in Mexico" (with L. M. Bassoco and C. Cartas), in P. B. R. Hazell, C. Pomareda and A. Valdez, editors, *Crop Insurance for Agricultural Development: Issues and Experience*, The Johns Hopkins University Press, 1986.

"A Note of Prudencio's Experimental Tests of the Coase Propositions" (with R. H. Patrick), *Journal of Environmental Economics and Management*, 1985.

"Economic Evaluation of an Agricultural Sector Investment Program: A Case Study in Peru" (with V. Santaniello and J. A. Echevarría), *Journal of Policy Modeling*, vol. 5, no. 2, 1983

"Operations Research Methods in Agricultural Policy Analysis" (with G. P. Kutcher), invited paper, *European Journal of Operational Research*, vol. 10, 1982.

"Market Equilibrium Computations in Activity Analysis Models" (with P. L. Scandizzo), *Operations Research*, vol. 29, no. 2, March-April 1981.

"Future Prospects for Mexican Agriculture," *The Southwestern Review of Management and Economics*, vol. 1, no. 3, 1981.

"Policy Issued in the Routing of Radioactive Materials Shipments," *Natural Resources Journal*, vol. 21, October 1981.

"Issues in Emergency Preparedness for Radiological Transportation Accidents" (with A. M. Church), *Natural Resources Journal*, vol. 21, October 1981.

"Agricultural Sector Programming Models: A Review of Alternative Approaches" (with G. Schiefer), *European Review of Agricultural Economics*, vol. 7, no. 3, 1980.

"A Macroeconometric Model of Inflation and Growth in South Korea" (with S. Y. Rhee), in *Economic Stabilization in Developing Countries*, W. Cline and S. Weintraub, editors, The Brookings Institution, Washington, D. C., 1980.

"A Multi-Sectoral Model with Endogenous Terminal Conditions" (with R. Inman and Y. H. Kim), *Journal of Development Economics*, vol. 6, June 1979.

"The Importance of Risk in Agricultural Planning Models" (with P. B. R. Hazell, M. Parthasarathy and C. Pomareda), *World Bank Staff Working Papers*, no. 307, Washington, D. C., November 1978.

"A Model of Agricultural Production and Trade in Central America" (with C. Cappi, L. Fletcher, C. Pomareda

and M. Wainer), in *Studies in Economic Integration in Central America*, The Brookings Institution, Washington, D. C., 1978. Reprinted in E. Thorbecke and L. Hall, eds., *Agricultural Sector Analysis and Models in Developing Countries*, FAO, Rome, 1982.

"Multi-Level Programming and Development Policy" (with W. Candler), *World Bank Staff Working Papers*, no. 258, Washington, D. C., May 1977.

"Una Metodología Cuantitativa de la Programación Agrícola" [A Quantitative Methodology for Agricultural Planning] (with L. M. Bassoco), *Demografía y Economía*, vol. 9, no. 3, 1975 (extended version of the following article).

"A Quantitative Approach to Agricultural Policy Planning" (with L. M. Bassoco), *Annals of Economic and Social Measurement*, vol. 4, October-November 1975. Reprinted in E. Thorbecke and L. Hall, eds., *Agricultural Sector Analysis and Models in Developing Countries*, FAO, Rome, 1982.

"Prices and Incomes in Linear Programming Models" (with J. H. Duloy), *American Journal of Agricultural Economics*, vol. 57, November 1975.

"Appraisal of Irrigation Projects and Related Policies and Investments" (with L. M. Bassoco and J. S. Silos), *Water Resources Research*, vol. 10, December 1974.

"CHAC: A Programming Model of Mexican Agriculture" (with J. H. Duloy), in *Multi-Level Planning: Case Studies in Mexico*, L. M. Goreux and A. S. Manne, editors, North-Holland Publishing Company, Amsterdam, 1973. Reprinted in E. Thorbecke and L. Hall, eds., *Agricultural Sector Analysis and Models in Developing Countries*, FAO, Rome, 1982.

"CHAC Results: Economic Alternatives for Mexican Agriculture" (with J. H. Duloy), in L. M. Goreux and A. S. Manne, 1973.

"A Programming Model of an Agricultural District" (with L. M. Bassoco, J. H. Duloy and D. Winkelmann), in L. M. Goreux and A. S. Manne, 1973.

"Investment and Employment Alternatives in the Agricultural District Model" (with J. H. Duloy and G. P. Kutcher), in L. M. Goreux and A. S. Manne, 1973.

"Linking the Agricultural Model and the Economy-Wide Model" (with J. H. Duloy), in L. M. Goreux and A. S. Manne, 1973.

"Planning with Facts: The Case of Korea," *American Economic Review*, vol. 60, May, 1970.

"The Korean Sectoral Model" (with I. Adelman, D. Cole and K. J. Lee), in *Practical Approaches to Development Planning: The Case of Korea*, I. Adelman, editor, The Johns Hopkins University Press, Baltimore, 1969.

"Formal Approaches to Regional Planning in Korea," in I. Adelman, 1969, *op. cit.*

C. Other Papers

“Value Chains, A Game Changer for Smallholders,” guest column published online by Devex, July 28, 2014.

“Assessing Climate Change Effects of IDB Projects: Concepts and Procedures,” with Bruce McCarl and Ximing Wu, prepared for the Inter-American Development Bank, April 2014.

“Improved Management and Conservation of Biodiversity and Critical Watersheds in Panama” (lead author), for USAID/Panama, May 2006.

“Toward More Efficient Agricultural Production and Marketing in Jordan,” with Amer S. Jaberin, for USAID/Jordan, May 2006.

“Ventajas Comparativas en la Agricultura Salvadoreña,” (Comparative Advantage in Salvadorean Agriculture), with Amy Angel, FUSADES, El Salvador, July 2004.

The Competitiveness of Colombian Agriculture, with Alvaro Balcázar, report prepared for the World Bank, the FAO, and USAID, November 2003.

“National Development Strategies,” note developed for The Carter Center and the participatory strategy formulation process in Mozambique, June 2003.

“The T21 Model and Economic Development Strategies,” The Carter Center, Atlanta, October 2002.

“Notes on the Role of Qat in the Yemeni Economy,” report prepared for the Government of Yemen and the Near East Office of the FAO, April 2002.

Project design paper for participatory development of an agricultural strategy in Nicaragua, for USAID/Nicaragua, September 2000.

La Agricultura Salvadoreña: Políticas Económicas para un Macro Sector (with Amy L. Angel), informe preparado para la Fundación Salvadoreña para el Desarrollo Económico y Social (FUSADES), abril 1999.

“Perspectivas y opciones para la Escuela Nacional de Agricultura ‘Roberto Quiñónez,’” informe preparado para el Ministerio de Agricultura y Ganadería y la Fundación Agropecuaria de El Salvador, octubre de 1998.

“Programa de Fortalecimiento Institucional al Ministerio Agropecuario y Forestal,” informe preparado para el Ministerio Agropecuario y Forestal de Nicaragua y el Banco Inter-Americano de Desarrollo, agosto 1998.

“Observaciones en torno al Marco Jurídico e Institucional que Condiciona el Desarrollo Sostenible del Darién, informe preparado para GEA Consultores bajo un proyecto del Banco Inter-Americano de Desarrollo, Panamá, abril de 1998.

“The Introduction of Agricultural Land Leasing into Estonia,” with W. Valletta and S. H. Keith, report to the Government of Estonia prepared through an FAO Technical Cooperation Project, March 1998.

"Observaciones sobre el Programa de Análisis de Políticas Agrícolas del CONAGRO en el Entorno Económico Actual" [Observations on CONAGRO's Program of Agricultural Policy Analysis in the Current Economic Context], for the program CONAGRO/IDB/UNDP, Nicaragua, August, 1995.

"Review of the Agricultural Models for Costa Rica Being Developed by Wageningen Agricultural University," Panamá, March 1995.

Una Nueva Estrategia Agrícola para El Salvador [A New Agricultural Strategy for El Salvador] (with R. Arias and V. de Calderón), FUSADES, San Salvador, El Salvador, 1994.

"Sugerencias en torno a un Programa de Reformas de las Políticas Agrícolas en la República Dominicana" [Suggestions on a Program of Reforms in Agricultural Policy in the Dominican Republic], in *Hacia una Política Nacional de Desarrollo Agropecuario* [Toward a National Program of Agricultural Development], Government of the Dominican Republic and the United Nations Development Program, Santo Domingo, Dominican Republic, December, 1993.

"The Agricultural Sector," draft chapter prepared with J. Paz for the *Country Economic Memorandum for Honduras*, World Bank, Washington, D. C., 1993.

"Bases para una Política Integral de Desarrollo Agrícola," prepared for the UNDP, Santo Domingo, Dominican Republic, November 1993.

Tasas de Protección Efectiva de los Principales Productos Agrícolas [Effective Protection Rates for Principal Agricultural Products], with Magdalena García, Serie Estudios de Economía Agrícola, Proyecto APAH, Tegucigalpa, Honduras, May 1992.

"El Papel de la Tierra en el Desarrollo Agrícola de Honduras" [The Role of Land in Honduran Agricultural Development], en la Memoria del Seminario, Acceso a la Tierra, Seguridad de la Tenencia e Inversión en el Uso Productivo y Sostenimiento de los Recursos Naturales, University of Wisconsin and Instituto Nacional Agrario, Tegucigalpa, Honduras, agosto de 1990, pp. 15-22.

Principal author of the *Agricultural Strategy Paper for Honduras*, USAID/Honduras, Tegucigalpa, 1990.

Una Estrategia para la Reactivación del Sector Agropecuario en El Salvador (with Mercedes Llort), Documento no. 6, Fundación Salvadoreña para el Desarrollo Económico y Social (FUSADES), San Salvador, El Salvador, Oct. 1989.

"Macroeconomic Policy Options for El Salvador" (with W. Loehr), report prepared for USAID/El Salvador, July 1989.

"Perspectivas sobre la Política Macroeconómica y el Sector Agropecuario," prepared for IICA, San Jose, Costa Rica, August 1988.

"Balance de la Política Agraria," *Proceso Económico*, Lima, Perú, segunda quincena de junio, 1998.

"Report on the CAPPA Workshop in Amman, Jordan, June-July, 1988," prepared for USAID and the FAO, July 1988.

"The Development of Agricultural Policy Analysis in Honduras" (with Julio Paz, J. T. Riordan and F. L. Mann), report prepared for USAID/Honduras, June 1988.

"Food Imports, Agricultural Policies and Agricultural Development in El Salvador, 1960-1987" (with M. Liévano della Torre), prepared for USAID/El Salvador, June 1988.

"Un Análisis Cuantitativo del Sector Cafetalero Dominicano" [A Quantitative Analysis of the Dominican Coffee Sector] (with C. A. Benito and T. Suriel), prepared for the Unidad de Política Agropecuaria, Santo Domingo, Dominican Republic, April 1988.

"A Note on the Structure of Agricultural Production in Peru" (with F. Ccama, A. M. Champi and L. Villaorduña), MIAC and GAPA, Lima, Peru, October 1987.

Agricultural Sector Strategy Report for Honduras (with Albert Brown and Arthur Coutu), prepared for USAID/Honduras, September 1987.

"The Role of Technical Cooperation in Sectoral Adjustment Programs," prepared for the Inter-American Development Bank, Washington, D C., August 1987.

"An Evaluation of the PL 480 Title I Programs in Honduras" (with C. A. Benito), prepared for USAID/Honduras, August 1987.

"First Evaluation of the Agricultural Policy Formulation and Management Project in Panama" (with M. A. Vedova and M. H. MacDonald), prepared for USAID/Panama, March 1987.

"Seguimiento sobre las Políticas Agrícolas en el Perú, 1986" [Monitoring Agricultural Policies in Peru] (with J. T. Riordan, F. Ccama and D. G. Heckerman), MIAC and GAPA, Lima, Peru, March 1987.

"The Policy Research Program in the ASEAN Agricultural Development Centre," report prepared for the Agricultural Project Formulation, Monitoring and Evaluation Project (APFME) of the Association of Southeast Asian Nations (ASEAN), November 1986.

"A Review of Panama's Draft Five-Year Agricultural Plan," report prepared for USAID/Panama, July 1986.

Co-author of USAID's country assistance strategy paper for Panama, December 1986.

"Agricultural Investment in the CAPPA System," report prepared for the Policy Analysis Division of the U. N. Food and Agriculture Organization, June 1986.

Prices, Costs and Comparative Advantage in Dominican Agriculture, prepared for the Latin America and Caribbean Office of the World Bank, April 1986.

"Technical Change in Models of Economic Equilibrium," paper prepared for the Italian National Research

Council, March 1986.

"A Review of the Role of CAPP in Agricultural Policy Planning," report prepared for Policy Analysis Division of the U. N. Food and Agriculture Organization, December 1985.

Public Investment Review in Mexico: The Agricultural Sector (with R. Celis), prepared for the Latin America and Caribbean Office of the World Bank, August 1985.

"Observaciones sobre el Programa de Trabajo de la Unidad de Estudios Agropecuarios, República Dominicana," report prepared for the Dominican Government and USAID's APAP Project, August 1985.

Structural Trends in Colombian Agriculture and the Role of Credit, prepared for the Latin America and Caribbean Office of the World Bank, June 1985.

"Observaciones sobre el Programa de Trabajo de la Unidad de Estudios Agropecuarios, República Dominicana," prepared for USAID's Agricultural Policy Analysis Project, Santo Domingo, Dominican Republic, August 1985.

"Propuesta de un Sistema para el Análisis de Políticas para la Agricultura de la República Dominicana," (with C. Pomareda), prepared for USAID/Dominican Republic, May 1985.

"Turkey: Sectoral Performance Possibilities in Agriculture" (with H. Gencaga), working paper, EMENA Agricultural Projects, the World Bank, February 1985.

"Turkey: Fertilizer Distribution and Inventory Management" (with H. Gencaga), working paper, EMENA Agricultural Projects, the World Bank, November 1984.

"Haitian Agriculture: Production Costs and Pricing and Fiscal Structures," prepared for the Latin America and Caribbean Office of the World Bank, August 1984.

Policy Issues in Mexican Agriculture, report prepared for the Latin America and Caribbean Office of the World Bank, July 1984.

"Análisis de la Política Agraria dentro del Contexto de Objetivos Nacionales y Sectoriales: El Caso del GAPA en Perú," report prepared for USAID's Agricultural Policy Analysis Project, Lima, Perú, May 1984.

Applications of a Sector Model to Issues of Trade and Pricing Policy in Nigerian Agriculture, report prepared for the Western Africa Regional Office of the World Bank, February 1984.

"A Model for Evaluating the Effects of Food Aid" (with P. B. R. Hazell), prepared for the International Food Policy Research Institute, Washington, D. C., January 1984.

Pricing Policy Analyses for Nigerian Agriculture, report prepared for the Western Africa Office of the World Bank, September 1983.

Guidelines for the Formulation and Evaluation of Socio-Economic Investment Projects in Central America

(with C. A. Benito), report prepared for the Secretariat for Economic Integration in Central America, May 1983.

"A Pilot Model for Nigerian Agriculture," prepared for the Western Africa Regional Office of the World Bank, mimeo, December 1982.

"Nutritional Relationships in Farm Models" (with D. Salcedo), prepared for the Study of the Effects of Agricultural Development Policies on Food Consumption, Secretariat for Economic Integration in Central America, doc. no. 28/82, Tegucigalpa, Honduras, October 1982.

"The Egyptian Agro-Economic Model and Egypt's Irrigation Investment Choices," report prepared for the World Bank and the Egyptian Ministry of Irrigation, September 1982.

"Análisis de las Interrelaciones del Sector Agrícola en un Horizonte de Corto y Mediano Plazo" [Analysis of Interrelations in the Agricultural Sector in the Short and Medium Run] (with L. M. Bassoco), report for the Office of the President of Mexico, Mexico, D. F., September 1982.

The Use of Hot Dry Rock Geothermal Resources for Space Heating: A Case Study (with R. G. Cummings et al.), Los Alamos National Laboratory Report LA-9541-MS, Los Alamos, New Mexico, September 1982.

"Mexican Agriculture toward 2000," report prepared for the Policy Analysis Division of the U. N. Food and Agriculture Organization, July 1981.

The Proposed Waste Isolation Pilot Plan (WIPP) and Its Impacts in the State of New Mexico (with H. S. Burness and R. G. Cummings), final report on research conducted for the New Mexico Energy and Minerals Department, March 1981.

"Socio-Economic Analyses of the Proposed Waste Isolation Pilot Plant Project" (with H. S. Burness and R. G. Cummings), *Proceedings of the 1980 National Waste Terminal Storage Program Information Meeting*, Office of Nuclear Waste Isolation, Columbus, Ohio, December 9-11, 1980.

"Current Status of the Korean Economy and the Fifth Five-Year Plan," report prepared for the World Bank and the Korean Government, August 1980.

Measuring Household Soiling Damages from Suspended Air Particulates: A Methodological Inquiry (with H. S. Burness and R. G. Cummings), report prepared for the U. S. Environmental Protection Agency, August 1980.

Evaluation of the (Forest Service) Resources Planning Act -- "Assessment" and "Alternative Directions" (with H. S. Burness and R. G. Cummings), report prepared for the Committee on Energy and Natural Resources, U. S. Senate, May 1980.

"Basic Needs and Mineral Exports: A Perspective Planning Model for Niger" (with Y. C. Park), mimeo, the World Bank, May 1980.

Notes on Practical Planning Issues, Korea Development Institute, Seoul, Korea, October 1977.

"Linear Transformations in Mathematical Programming" (with W. Candler), Development Research Center Discussion Paper No. 21, World Bank, 1977.

"Multi-Level Programming" (with W. Candler), Development Research Center Discussion Paper No. 20, World Bank, 1977.

"An Econometric Planning Model for Korea," PPC, USAID/Washington, January 1969.

D. Conference Presentations

"Water Management Policies for Development," presented at the IV International Conference on Urban Biology, Manaus, Brazil, November 10, 2011.

"El Potencial de las Zonas Francas Agrícolas en Centroamérica" (The Potential of Agricultural Free Trade Zones in Central America), presented at a conference of the Inter-American Development Bank and the Costa Rican Government, San José, Costa Rica, July 2011.

"Agricultural Development Policy: Concepts and Experiences," presentation at FAO/Rome, March 11, 2002.

"Development Cooperation Processes: Issues in Participation and Ownership," presented at the Development Cooperation Forum, The Carter Center, Atlanta, Georgia, February 22, 2002.

Presentations on the economics of water resource management, Training Course for Water Policy Analysis in Agriculture for Central Asia, Almaty, Kazakhstan, September 2001.

Presentation on participatory approaches for development strategies and policies, at: 1) a workshop for nine Eastern Caribbean States, St. Lucia, July 2000, sponsored by PriceWaterhouseCooper and DFID; 2) USAID/Nicaragua, in September, 2000; and 3) for the annual meeting of the Central American Council of Ministers of Agriculture, held in Panama, November 2000.

Discussion of quantitative methodologies for land use analysis, presented at the Final Seminar on Methodologies for Land Use Analysis at Different Scales, Research Program on Sustainability in Agriculture (REPOSA), sponsored by Wageningen Agricultural University, CATIE, and the Costa Rican Ministry of Agriculture and Livestock, Turrialba, Costa Rica, February 8, 1999.

"Políticas Macroeconómicas y Desarrollo Sostenible del Sector Agropecuario" (Macroeconomic Policy and Sustainable Development of the Agricultural Sector), invited international address given at the II Foro Nacional de Alto Nivel (Second High-Level National Forum), San Salvador, El Salvador, February 18, 1998.

"Methodological Aspects of Estonia's National Agricultural Strategy," seminar given in FAO, Rome, July 1997.

"Analytical Considerations for Estonia's National Agricultural Strategy," presentation at the Workshop on the National Development Strategy, sponsored by the Estonian Agricultural University and the Estonian

Ministry of Agriculture, Tartu, Estonia, March 1997.

"Issues in the Development of Guyana's National Strategy," presentation at an Advisory Group Meeting of International Donors held at The Carter Center, Atlanta, Georgia, June 1996.

Comment on aggregation issues in the eco-regional approach, and session chair, CGIAR International Seminar on the Eco-Regional Approach, ISNAR, The Hague, December 1994.

"Policies for Sustainable Agricultural Development," Keynote Presentation at a Seminar of the Central American Commission for Environment and Development (CCAD), San Salvador, El Salvador, September, 1994.

Participation in a panel of international experts to review new policy directions for the United Nations Food and Agriculture Organization, FAO, Rome, June 1994.

"Una Nueva Estrategia Agrícola para El Salvador" [A New Agricultural Strategy for El Salvador], FUSADES Seminar, San Salvador, El Salvador, June 1994.

"Política Macroeconómica y Sectorial Agraria: La Experiencia Internacional" [Macroeconomic and Agrarian Sector Policy: The International Experience], Conferencia sobre Nuevas Opciones de Política Agrícola, sponsored by the World Bank and the Ministry of Planning of El Salvador, San Salvador, February 1994.

"Sugerencias en Torno a un Programa de Reformas de las Políticas Agrícolas en la República Dominicana" [Suggestions on a Program of Agricultural Policy Reform in the Dominican Republic], National Seminar on Agricultural Policies, Government of the Dominican Republic and the United Nations Development Program, Santiago, Dominican Republic, November 1993.

"Políticas de Crecimiento Económico para los Pequeños Agricultores" [Economic Growth Policies for Small Farmers], presented at the Fifth Biennial Conference of the Permanent Seminar for Agrarian Research (SEPIA), Universidad Nacional de San Agustín, Arequipa, Peru, August 25, 1993.

Lectures on agricultural policy analysis in the Short Course on Agricultural Policy, Escuela Agrícola Panamericana, Zamorano, Honduras, July 1993. Course sponsored by FAO/PROCAPLAN.

"The Honduran Program of Agricultural Policy Reforms," invited lecture, The Brookings Institution, Washington, D. C., June 1993.

"Una Estrategia Integral del Desarrollo Agrícola" [An Integrated Strategy for Agricultural Development], presented at an international seminar of REDCA [Central American Network for Agricultural Research], sponsored by CATIE [Tropical Agronomic Center for Research and Teaching], Panama City, Panama, September 1991.

"Metodologías de Análisis de Políticas Agrícolas" [Methodologies for Agricultural Policy Analysis], Agricultural Policy Seminar for Central America, IICA, Antigua, Guatemala, 1990.

"Structural Adjustment for Agriculture," presentation at IICA's seminar entitled "Los Programas de Ajuste

Estructural y Sectorial: Implicaciones para la Reactivación y Desarrollo de la Agricultura," San José, Costa Rica, November 30, 1987.

"Perspectivas del Agro Peruano" [Perspectives on Peruvian Agriculture], prepared for the First Annual Congress of the Peruvian Association of Agricultural Economics, Universidad Nacional Agraria - La Molina, Lima, Peru, July 10, 1987.

"La Política Agropecuaria Peruana en la Coyuntura Económica Actual" [Peruvian Agricultural and Livestock Policy in the Current Economic Context], prepared for the Second Biennial Conference of the Permanent Seminar for Agrarian Research (SEPIA), Universidad Nacional de San Cristobal de Huamanga, Ayacucho, Peru, May 1987.

"A Model of Structural Adjustment in Agriculture" (with V. Santaniello), presented at the annual meetings of the International Agricultural Economics Association, Malaga, Spain, August 1985.

"Tariff Policy under Income Distribution Objectives" (with P. Oslund), presented at the U.S.-Mexico Workshop on Agricultural Trade, Pricing Policy and Resources, Santa Fe, New Mexico, August 1983.

"Crop Insurance as Public Policy toward Agriculture: An Analysis of the Mexican Experience" (with L. M. Bassoco and C. Cartas) presented at the IICA-IFPRI Conference on Agricultural Risks, Insurance and Credit in Latin America, San Jose, Costa Rica, February 8-10, 1982.

"Perceived Risk and Catastrophic Events" (with H. S. Burness and R. G. Cummings), invited paper delivered at the 55th Annual Conference on the Western Economic Association, San Diego, California, June 16, 1980.

"A Macroeconometric Model of Inflation and Growth in South Korea" (with S. Y. Rhee), Brookings Institution Conference on Economic Stabilization Policies in Less Developed Countries, Washington, D. C., October 1979.

"A Computable Class of General Equilibrium Models" (with P. Scandizzo), Econometrics Society Meetings, Vienna, September 1977.

"A Quantitative Agricultural Planning Methodology" (with L. M. Bassoco), Fourth International Input-Output Conference, Vienna, April 1975.

"Agriculture and the Energy Crisis" (with J. H. Duloy and P. B. R. Hazell), paper presented to the American Agricultural Economics Association Meetings, College Station, Texas, August 1974.

"Appraisal of Irrigation Projects under Alternative Policies and Goals: the Río Colorado and El Bajío Irrigation Districts" (with L. M. Bassoco and J. S. Silos), International Symposium on Water Resources Planning, Mexico, D. F., December 1972.

"Competitive and Noncompetitive Demand Structures in Linear Programming" (with J. H. Duloy), Econometrics Society Meetings, Boulder, Colorado, August 1971.

"The South Korean Economy in the 1960s," presented at the Annual Meeting of the Association for Asian

Studies, Washington, D. C., March 1971.

"Planning with Facts: The Case of Korea," presented at the American Economics Association Meetings, New York, December 1969.

"A Stabilization Model for Korea" (with Mahn Je Kim), presented at the Econometrics Society Meetings, Tokyo, June 1967.

"The Korean Input-Output Planning Model" (with Kee Jung Lee), presented at the Econometrics Society Meetings, Tokyo, June 1967.