



OECD Review of Agricultural Policies

COLOMBIA



OECD Review of Agricultural Policies: Colombia 2015



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Foreword

This Review of Agricultural Policies: Colombia is one of a series of reviews of national agricultural policies undertaken by the OECD's Committee for Agriculture. On 29 May 2013, the OECD Council decided to open accession discussions with Colombia. On 19 September 2013, the Council adopted a *Roadmap for the Accession of Colombia to the OECD Convention* [C(2013)110/FINAL] (hereafter "the Roadmap") setting out the terms, conditions and process for accession. The Roadmap provides that in order to allow the OECD Council to take an informed decision, Colombia will undergo in-depth reviews by the relevant OECD technical committees, including the Committee for Agriculture, which will then provide the Council with a formal opinion evaluating Colombia's willingness and ability to implement OECD legal instruments, and assessing Colombia's policies and practices as compared to OECD best policies and practices.

This Review is being used as a background document for the accession review currently being undertaken by the OECD Committee for Agriculture as part of the process for Colombia's accession to the OECD. In accordance with paragraph 14 of Colombia's Accession Roadmap, the Committee for Agriculture agreed to declassify the report in its current version and publish it under the authority of the Secretary General, in order to allow a wider audience to become acquainted with the issues raised in the report. Publication of this document and the analysis and recommendations contained therein does not prejudge in any way the results of the ongoing review of Colombia by the Committee for Agriculture as part of its process of accession to the OECD.

The Review examines the policy context and the main trends in Colombia's agriculture. It classifies and measures the support provided to agriculture using the same method the OECD employs to monitor agricultural policies in OECD countries and a growing number of non-member economies, such as Brazil, China, Indonesia, Kazakhstan, Russia, South Africa and Ukraine. On request from the Colombian authorities, the Review includes a special chapter on key challenges for the agricultural innovation system, drawing on the framework developed at OECD to analyse the role of the government in fostering innovation in the food and agricultural sector. The Review is a precursor to continue OECD engagement with Colombia on agricultural policy issues through the regular monitoring of agricultural policy developments.

The study was carried out by the Trade and Agriculture Directorate (TAD). Dalila Cervantes-Godoy co-ordinated the report and was one of the authors together with Silvia Sorescu and Catherine Moreddu. Valuable background information was provided by Natalia Mayorga (Colombia) for Parts I and II and by Luis Alberto Zuleta and Lino Jaramillo (Colombia) for Part III. Statistical support was provided by Florence Bossard. Anita Lari provided administrative and secretarial assistance. Michael Thomas provided editorial support. Anita Lari and Michèle Patterson provided publication support. Carmel Cahill, Christian Daude, Jared Greenville, Sebastian Nieto-Parra, Raffaelle Trapasso, Trudy Witbreuk and many other colleagues in the OECD Secretariat and member country delegations furnished valuable comments on earlier drafts of the report.

The Review benefited greatly from the support provided by the Colombian Ministry of Agriculture and Rural Development (MADR). Dario Jaramillo, Diana Jimenez and Morelca Girardo were the main

contacts and liaison persons on all aspects of the study. The study benefited from the substantive inputs from the team of experts from the Colombian MADR and its related entities (Elizabeth Arciniegas, Carlos Pereira, Ivan Piraquive, Juan Lucas Restrepo, Alejandro Ruiz, Mario Villamil), the National Planning Department (Clara Duque and Diego Mora), and the National Administrative Department of Statistics (Andrés Clavijo and Mónica Madrid). Experts from these institutions provided most of the data and essential information on the functioning of agricultural programmes in Colombia. The study also benefited from the input of staff from MADR and its related entities and participants at preparatory meetings and consultations in Bogota, including researchers from academia.

The study was reviewed at an in-country Roundtable with Colombian officials in July 2014. Subsequently, the Colombian delegation led by Mr Hernán Román Calderon, Vice-Minister for Agriculture, participated in the peer review of Colombian agricultural policies by the OECD's Committee for Agriculture at its 163rd session in December 2014. We are grateful to Steve Neff (ERS-USDA, USA), Rodrigo Vega (MINAGRI, Chile), and Matthew Worrell (DFAT, Australia) for their role as lead discussants during this peer review. Colombian officials have been involved from the initial discussions of the study outline through to the peer review and final revisions, but the final report remains the sole responsibility of the OECD.

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Acronyms

Acronym	Spanish name	English name
AEA	<i>Apuesta Exportadora Agropecuaria</i>	Agricultural Export Bet
AIS	<i>Agro Ingreso Seguro</i>	Stable Farm Income
ANALAC	<i>Asociación Nacional de Productores de Leche</i>	National Association of Milk Producers
ANCTIA	<i>Agenda Nacional de Ciencia, Tecnología e Innovación Agropecuaria</i>	National Agenda for Agricultural Science, Technology and Innovation
ANDI	<i>Asociación Nacional de Empresarios de Colombia</i>	Colombia's National Business Association
ASOCANA	<i>Asociación de Productores de Caña de Azúcar</i>	Association of Sugar Cane Producers
ASOCOLFLORES	<i>Asociación Colombiana de Exportadores de Flores</i>	Colombian Association of Flowers Exporters
ASOPORCULTORES	<i>Asociación Colombiana de Porcicultores</i>	Colombian Association of Pig Farmers
ASTI	<i>Indicadores de Ciencia y Tecnología Agrícola</i>	Agricultural Science and Technology Indicators
AT	<i>Asistencia Técnica</i>	Technical Assistance
AUC	<i>Autodefensas Unidas de Colombia</i>	United Self-Defence Forces of Colombia
AUGURA	<i>Asociación de Productores de Banano de Colombia</i>	Association of Colombian Banana Producers
AUNAP	<i>Autoridad Nacional de Acuicultura y Pesca</i>	National Authority for Aquaculture and Fisheries
BANCOLDEX	<i>Banco de Comercio Exterior de Colombia S.A.</i>	Foreign Trade Bank of Colombia
BMC	<i>Bolsa Mercantil de Colombia</i>	Colombian National Agricultural Stock Exchange
BSE	<i>Encefalopatía Espongiforme Bovina</i>	Bovine Spongiform Encephalopathy
CADR	<i>Ciencias Agrarias y Desarrollo Rural</i>	Agricultural Sciences and Rural Development
CAR	<i>Corporacion Autonóma Regional</i>	Autonomous Regional Corporation
CARICOM	<i>Comunidad del Caribe</i>	Caribbean Community and Common Market
CATIE	<i>Centro Agronómico Tropical de Investigación y Enseñanza</i>	Tropical Agronomy Research and Teaching Centre
CCI	<i>Corporación Colombia Internacional</i>	Colombia International Corporation
CDT	<i>Centro de Desarrollo Tecnológico</i>	Technological Development Centre
CENIs	<i>Centros Nacionales de Investigación</i>	National Research Centres
CENIACUA	<i>Centro de Investigación de la Acuicultura de Colombia</i>	Colombian Aquaculture Research Centre
CENIBANANO	<i>Centro de Investigación del Banano</i>	Banana Research Centre

Acronym	Spanish name	English name
CENICAFÉ	Ciencia Tecnología e Innovación para la Caficultura Colombiana	Science, Technology and Innovation for Coffee Production in Colombia
CENICAÑA	Centro de Investigación de la Caña de Azúcar de Colombia	Colombian Sugar Cane Research Centre
CENICEL	Centro de Investigación en Cereales y Leguminosas	Grains and Legumes Research Centre
CENIFLORES	Centro de Innovación de la Floricultura Colombiana	Colombian Centre for Innovation in Floriculture
CENIPALMA	Centro de Investigación en Palma de Aceite	Palm Oil Research Centre
CENIPAPA	Centro Virtual de Investigación de la Cadena Agroalimentaria de la Papa	Virtual Research Centre for the Potato Agro-food Chain
CENIRED	Corporación Red Especializada de Centros de Investigación y Desarrollo Tecnológico del Sector Agropecuario de Colombia	Corporation Specialised Network of Technological Research and Development Centres of the Agricultural Sector in Colombia
CET	Arancel Externo Común	Common External Tariff
CEVIPAPA	Centro Virtual de Desarrollo Tecnológico de la Cadena Agroalimentaria de la Papa	Virtual Technological Development Centre for the Potato Agro-food Chain
CIEBREG	Centro de Investigaciones y Estudios en Biodiversidad y Recursos Genéticos	Centre for Research and Study in Biodiversity and Genetic Resources
CGIAR	Grupo Consultivo sobre Investigación Agrícola Internacional	Consultative Group on International Agricultural Research
CGPA	Agro-Centros Provinciales de Gestión Agro-empresarial	Provincial Agro-Centres for Agribusiness Management
CGR	Contraloría General de la Republica	Treasury Inspector's Office
CIAT	Centro Internacional para la Agricultura Tropical	International Centre for Tropical Agriculture
CIB	Corporación de Investigaciones Biológicas	Corporation for Biological Research
CIF	Certificado de Incentivo Forestal	Forest Incentive Certificate
CII-RT	Centros Integrados de Inteligencia para la Restitución de Tierras	Integrated Intelligence Centres for Land Restitution
CIRAD	Centro de Cooperación Internacional para la Investigación Agronómica	International Cooperation Centre for Agronomy Research
CLAYUCA	Consortio Latinoamericano y del Caribe de Apoyo a la Investigación y al Desarrollo de la Yuca	Latin America and the Caribbean Consortium for the Support of Cassava Research and Development
CMDR	Consejos Municipales de Desarrollo Rural	Municipal Rural Development Boards
CNBT	Consejo Nacional de Beneficios Tributarios en Ciencia, Tecnología e Innovación	National Council for Tax Benefits for Science, Technology and Innovation
CNCTI	Consejo Nacional de Ciencia Tecnología e Innovación	National Board for Science, Technology and Innovation
CNMH	Centro Nacional de Memoria Histórica	National Centre of Historical Memory
CODECTI	Comité Departamental de Ciencia, Tecnología e Innovación	Departmental Committee for Science, Technology and Innovation
CODHES	Consultoría para los Derechos Humanos y el Desplazamiento	Consultancy for Human Rights and Displacement
COLCIENCIAS	Departamento Administrativo de Ciencia, Tecnología e Innovación	Administrative Department for Science, Technology and Innovation
COLR	Comités Operativos Locales de Restitución	Local Operational Restitution Committees

Acronym	Spanish name	English name
COMCAJA	Caja de Compensaciones Familiar Campesina	Family Compensation Fund
CONALGODON	Confederación Colombiana de Algodón	Colombian Confederation of Cotton
CONDESAN	Consortio para el Desarrollo Sostenible de la Ecoregión Andina	Consortium for the Sustainable Development of the Andean Eco-region
CONIF	Corporación Nacional de Investigación y Fomento Forestal	National Corporation for Forestry Research and Development
CONPES	Consejo Nacional de Política Económica y Social	National Council for Economic and Social Policies
CONSA	Consejo Nacional de Secretarios de Agricultura	National Council of Agriculture Secretaries
CONSEA	Consejo Seccional Agropecuario	Departmental Council for Agricultural Development
COP	Peso Colombiano	Colombian peso
CORPOICA	Corporación Colombiana de Investigación Agropecuaria	Colombian Corporation for Agricultural Research
CPGA	Centros Provinciales de Gestión Agroempresarial	Provincial Agribusiness Management Centres
CRC	Comisiones Regionales de Competitividad	Regional Competitiveness Commissions
CSE	Estimador de Apoyo al Consumidor	Consumer Support Estimate
CSPD	Comisión de Seguimiento a la Política Pública sobre Desplazamiento Forzado	Monitoring Committee for Public Policy on Forced Displacement
CUEE	Comités Universidad-Empresa-Estado	University-Company-State Committees
DANE	Departamento Administrativo Nacional de Estadística	National Administrative Department of Statistics
DIAN	Dirección de Impuestos y Aduanas Nacionales	National Department of Customs and Duties
DRE	Desarrollo Rural con Equidad	Equitable Rural Development
DRI	Fondo de Cofinanciación para la Inversión Rural	Fund for Co-financing of Rural Investment
DNDA	Dirección Nacional de Derechos de Autor	National Directorate for Copyrights
DNP	Departamento Nacional de Planeación	National Planning Department
DPS	Departamento para la Prosperidad Social	Department for Social Prosperity
ECLAC	Comisión Económica para América Latina y el Caribe	Economic Commission for Latin America and the Caribbean
ENA	Encuesta Nacional Agropecuaria	National Agricultural Survey
ENSIN	Encuesta Nacional de la Situación Nutricional	National Survey of Nutritional Status
EPSAGROS	Centros Provinciales y Organizaciones de Profesionales Privados	Provincial Centres and Private Professional Organizations
ETS	Entidades Territoriales de Salud	Territorial Health Entities
FAER	Fondo de Apoyo Financiero para la Energización de las Zonas Rurales	Fund of Financial Support to Rural Energy Provision
FAG	Fondo Agrícola de Garantía	Agricultural Collateral Fund
FAO	Organización de las Naciones Unidas para la Alimentación y la Agricultura	Food and Agriculture Organization of the United Nations
FARC	Fuerzas Armadas Revolucionarias de Colombia	Revolutionary Armed Forces of Colombia

Acronym	Spanish name	English name
FAZNI	Fondo de Apoyo Financiero para la Energización de las Zonas No Interconectadas	Fund of Financial Support to Energy Provision in Non-Interconnected Zones
FEDEARROZ	Federación de Productores de Arroz	Federation of Rice Producers
FEDECACAO	Federación Nacional de Cacaoteros	National Federation of Cocoa Producers
FEDECAFE	Federación Nacional de Cafeteros	National Federation of Coffee Producers
FEDEGAN	Federación Colombiana de Ganaderos	National Federation of Cattle Farmers
FEDEPALMA	Federación Nacional de Cultivadores de Palma de Aceite	National Federation of Palm Oil Producers
FEDEPANELA	Federación de Productores de Panela	National Federation of Panela Producers
FEDEPAPA	Federación Colombiana de Productores de Papa	Colombian Federation of Potato Producers
FEDEPLACOL	Federación de Productores de Platano de Colombia	Colombian Federation of Plantain Producers
FENALCE	Federación Nacional de Cultivadores de Cereales	National Federation of Cereal Producers
FENALCE	Federación Nacional de Cultivadores de Cereales	National Federation of Cereal Producers
FENAVI	Federación Nacional de Avicultores de Colombia	National Federation of Poultry Producers
FEPE	Fondo de Estabilización de Precios	Price Stabilization Fund
FINAGRO	Fondo de Financiamiento para el Sector Agropecuario	Financing Fund for the Agricultural Sector
FNA	Fondo Nacional Agropecuario	Agricultural National Fund
FONSA	Fondo Nacional de Solidaridad Agropecuaria	Agricultural National Solidarity Fund
FONTAGRO	Fondo Regional de Tecnología Agropecuaria	Regional Fund for Agricultural Technology
GAO	Producción Agropecuaria Total	Gross Agricultural Output
GDP	Producto Interno Bruto	Gross Domestic Product
GSSE	Estimador de apoyos a servicios generales	General Services Support Estimate
IAF	Interventorías Administrativas y Financieras	Administrative and Financial Auditings
ICA	Instituto Colombiano Agropecuario	Colombian Institute of Agriculture
ICBF	Instituto Colombiano de Bienestar Familiar	Colombian Institute of Family Welfare
ICETEX	Instituto Colombiano de Crédito Educativo y Estudios Técnicos en el Exterior	National Colombian Institute for Educational Loans and Technical Studies Overseas
ICFES	Instituto Colombiano para la Evaluación de la Educación	Colombian Institute for Assessment in Education
ICR	Incentivo a la Capitalización Rural	Rural Capitalization Incentive
I&D	Investigación y Desarrollo	Research and Development (R&D)
IDEAM	Instituto de Hidrología, Meteorología y Estudios Ambientales	Institute of Hydrology, Meteorology and Environmental Studies
IDEMA	Instituto de Mercadeo Agropecuario	Agricultural Marketing System
IEATDR	Incentivo Económico a la Asistencia Técnica Directa Rural	Economic Incentive to Direct Rural Technical Assistance
IEP	Investigación como Estrategia Pedagógica	Research as a Pedagogic Strategy
IGAC	Instituto Geográfico Agustín Codazzi	Agustín Codazzi Geographical Institute

Acronym	Spanish name	English name
IICA	Instituto Interamericano de Cooperación para la Agricultura	Inter-American Institute for Cooperation in Agriculture
IMF	Fondo Monetario Internacional	International Money Fund
INAT	Instituto Nacional de Adecuación de Tierras	National Institute for Land Improvement
INCODER	Instituto Colombiano de Desarrollo Rural	Colombian Institute for Rural Development
INCORA	Instituto Colombiano de la Reforma Agraria	Colombian Institute for Agrarian Reform
INDUARROZ	Federacion Nacional de los Empresarios del Sector Arrocero	National Federation of Entrepreneurs in the Rice Sector
INPA	Instituto Nacional de Pesca y Acuicultura	National Institute for Fisheries and Aquaculture
INS	Instituto Nacional de Salud	National Institute of Health
INVIAS	Instituto Nacional de Vías	National Institute of Roads Network
INVIMA	Instituto Nacional de Vigilancia de Medicamentos y Alimentos	National Institute for the Surveillance of Food Products and Medicines
IPM	Índice de Pobreza Multidimensional	Index of Multidimensional Poverty
IPR	Derechos de Propiedad Intelectual	Intellectual Property Rights
ITC	Tecnología de la Información y las Comunicaciones	Information Technology and Communications
ITU	Unión Internacional de Telecomunicaciones	International Telecommunication Union
LAC	América Latina y el Caribe	Latin America and Caribbean
LEC	Línea Especial de Crédito	Special Credit Line
MAC	Mecanismo Público de Administración de Contingentes Agropecuarios	Public Mechanism for the Administration of Agricultural Quotas
MADR	Ministerio de Agricultura y Desarrollo Rural	Ministry of Agriculture and Rural Development
MADS	Ministerio de Ambiente y Desarrollo Sostenible	Ministry of Environment and Sustainable Development
MFN	Nación Más Favorecida	Most Favoured Nation
MinCIT	Ministerio de Comercio, Industria y Turismo	Ministry of Trade, Industry and Tourism
MinTIC	Ministerio de Tecnologías de la Información y las Comunicaciones	Ministry of Information Technology and Communications
MPS	Apoyo al precio de mercado	Market Price Support
MSPS	Ministerio de Salud y Protección Social	Ministry of Health and Social Protection
NAC	Coeficiente de Asistencia Nominal	Nominal Assistance Coefficient
NGO	Organización No Gubernamental	Non-Governmental Organisation
NPC	Coeficiente de Protección Nominal	Nominal Protection Coefficient
OCAD	Órganos Colegiados de Administración y Decisión	Administration and Decision-Making Collegiate Agencies
OCyT	Observatorio Colombiano de Ciencia y Tecnología	Colombian Observatory of Science and Technology
OLDER	Organización Local para el Desarrollo Rural	Local Organization for Rural Development
PCI	Programa Contra los Cultivos Ilícitos	Programme Against Illicit Crops
PEDAF	Proyectos Especiales de Desarrollo Agropecuario o Forestal	Special Projects for Agricultural and Forestry Development
PEPNCTA	Plan Estratégico del Programa Nacional de Ciencia y Tecnologías Agropecuarias	Strategic Plan for the National Agricultural Science and Technology Programme

Acronym	Spanish name	English name
PGATs	Planes Generales de Asistencia Técnica Municipales	General Plans for Municipal Technical Assistance
PIC	Protección al Ingreso Cafetero	Support to Coffee Producers Incomes
PNCRT	Programa Nacional de Consolidación y Reconstrucción Territorial	National Policy for Territorial Consolidation and Reconstruction
PNCTIA	Plan Nacional de Ciencia, Tecnología e Innovación Agropecuario	National Plan for Science, Technology and Innovation in Agriculture
PND	Plan Nacional de Desarrollo	National Development Plan
POAI	Plan Operacional Anual de Inversiones	Annual Operating Plan of Investment
PPP	Alianza Público-Privada	Public-Private Partnership
PRAN	Programa de Reactivación del Sector Agropecuario a Nivel Nacional	National Agricultural Revitalisation Programme
PROCANA	Asociación Colombiana de Productores y Empresarios en el sector de la Caña de Azúcar	Colombian Association of Sugar Cane Producers and Agribusiness
PROCOLOMBIA (PROEXPORT)	Promoción de Turismo, Inversión y Exportaciones	Tourism, Investment and Export Promotion
PRONATTA	Programa Nacional de Transferencia de Tecnología	National Programme for the Transfer of Technology
PSE	Estimador de Apoyo al Productor	Producer Support Estimate
R&D	Investigación y Desarrollo	Research and Development
RIDAC	Red de Información Documental Agropecuaria de Colombia	Colombian Agricultural Network of Documentary Information
RRI	Reforma Rural Integrada	Rural Comprehensive Reform
RUPD	Registró Único de Población Desplazada	Unique Registry of Displaced Population
RUPTA	Registro Único de Predios y Territorios Abandonados	Unique Registry of Abandoned Farms and Territories
SAC	Sociedad de Agricultores de Colombia	Colombian Farmers Society
SAF	Sistema de Alerta Fitosanitario	Phytosanitary Alert System
SAFP	Sistema Andina de Franja de Precios	Andean Price Band System
SAT	Sistema de Administración de Tierras	Land Administration System
SCT	Transferencia Individual al Producto	Single Commodity Transfer
SECOPÍ	Servicio Compartido de Propiedad Intelectual en el Sector Agropecuario	Intellectual Property Shared Services in the Agricultural Sector
SENA	Servicio Nacional de Aprendizaje	National Agency for Learning
SEPC	Sistema Electrónica para el Programa de Coberturas	Electronic System for the Hedging Programme
SGR	Sistema General de Regalías	General System of Royalties
SIA	Sistema de Información Agropecuaria	Agricultural Information System
SIAC	Sistema de Información Ambiental de Colombia	Colombian Environmental Information System
SIC	Superintendencia de Industria y Comercio	Superintendence for Industry and Commerce
SIJYP	Sistema de Información de Justicia y Paz	Justice and Peace Information System
SINIGAN	Sistema Nacional de Identificación e Información del Ganado	National System of Identification and Information of Cattle
SINTAP	Sistema Nacional de Transferencia de Tecnología Agropecuaria	National System for the Transfer of Agricultural Technology

Acronym	Spanish name	English name
SIPSA	<i>Sistema de Información de Precios del Sector Agropecuario</i>	Agricultural Price Information System
SISBEN	<i>Sistema de Identificación de Potenciales Beneficiarios de Programas Sociales</i>	System for Identifying and Selecting Beneficiaries of Social Programmes
SISMEG	<i>Seguimiento a Metas de Gobierno</i>	Monitoring System of Government Goals
SME	<i>Pequeña y Mediana Empresa (PYME)</i>	Small and Medium Sized Enterprises
SNC	<i>Sistema Nacional de Competitividad</i>	National System for Competitiveness
SNCTA	<i>Sistema Nacional de Ciencia y Tecnología Agroindustrial</i>	National Agro-Industrial Science and Technology System
SNCTI	<i>Sistema Nacional de Ciencia Tecnología e Innovación</i>	National Science, Technology and Innovation System
SSAT	<i>Subsistema de Asistencia Técnica Agropecuaria</i>	Technical Assistance Subsystem for Agriculture
STACA	<i>Servicio Técnico Agrícola Colombo-Americano</i>	Colombian-American Technical Assistance Service
STI	<i>Ciencia, Tecnología e Innovación</i>	Science, Technology and Innovation
TA	<i>Asistencia Técnica</i>	Technical Assistance
TDA	<i>Titulo de Desarrollo Agropecuario</i>	Agricultural Development Title
TRQ	<i>Contingentes arancelarios</i>	Tariff rate quotas
TSE	<i>Estimador al Apoyo Total</i>	Total Support Estimate
UAEOS	<i>Unidad Administrativa Especial de Organizaciones Solidarias</i>	Special Administrative Unit for Solidary Organizations
UAF	<i>Unidad Agrícola Familiar</i>	Family Agricultural Unit
UDCA	<i>Universidad de Ciencias Aplicadas y Ambientales</i>	University of Applied Sciences and Environmental Studies
UMATAS	<i>Unidades Municipales de Asistencia Técnica Agropecuaria</i>	Municipal Units for Technical Assistance in Agriculture
UNDP	<i>Programa de las Naciones Unidas para el Desarrollo</i>	United Nations Development Programme
UNODC	<i>Oficina de las Naciones Unidas contra la Drogas y el Delito</i>	United Nations Office on Drugs and Crime
UPRA	<i>Unidad de Planificación Rural Agropecuaria</i>	Agricultural Rural Planning Unit
URT	<i>Unidad Administrativa Especial de Gestión de Restitución de Tierras Despojadas</i>	Special Administrative Unit for Managing the Restitution of Forcibly Stripped Land
VAT	<i>Impuesto del Valor Agregado</i>	Value-Added Tax
WDI	<i>Indicadores del Desarrollo Mundial</i>	World Development Indicators
WEF	<i>Foro Económico Mundial</i>	World Economic Forum
WEO	<i>Base de Datos Económicos Mundiales del Fondo Monetario Internacional</i>	World Economic Outlook Database
WIPO	<i>Organización Mundial de Propiedad Intelectual</i>	World Intellectual Property Organization
WITS	<i>Solución Comercial Integrada Mundial</i>	World Integrated Trade Solution
WTO	<i>Organización Mundial de Comercio</i>	World Trade Organization
ZFP	<i>Zona Franca Permanente</i>	Permanent Free Zone
ZFPE	<i>Zona Franca Permanente Especial</i>	Special Permanent Free Zone
ZNI	<i>Zonas No Interconectadas</i>	Non – Interconnected Zones

Executive summary

Colombia is the fifth largest and the third most populous country in Latin America, with a surface of 1.1 million km² and a population of 47 million people. The only South American country that borders both the Atlantic and the Pacific Oceans, Colombia also has abundant agricultural land and fresh water, is exceptionally biodiverse and is rich in natural resources such as nickel, copper, iron, coal, natural gas, oil, gold, silver, platinum, and emeralds.

In the early 1990s, Colombia undertook a policy of economic liberalisation that included: the liberalisation of imports and the foreign exchange market; deregulation of foreign investment; fiscal decentralisation; financial, tax and labour reforms; reform of the pension system and health sector; and privatisation of public enterprises. After a period of significant economic growth, a severe economic and financial crisis followed in 1998-99 and triggered a further series of reforms which fostered macroeconomic stabilisation. Prudent macroeconomic management since then has helped Colombia endure the world financial crisis and get the most out of the commodity boom. The social context is improving as poverty rates are declining, but the income inequality rate remains extremely high.

The agricultural sector has traditionally been of key importance to the Colombian economy, given its contribution to GDP, employment and exports. While the share of primary agriculture in GDP has declined from 16.5% in 1990 to 5.2% in 2013, it remains a key sector in terms of employment, although this too has decreased from a 26% share in 1990 to 17.5% in 2013. Annual growth rates of the value of agricultural production have fluctuated significantly over the last two decades, with a relatively low growth rate of 1.6% since 1990. Agricultural products currently represent approximately 11% of Colombian total exports and have been dominated by traditional products, such as coffee, bananas and sugar. Internal conflicts since the 1940s, which triggered massive displacement of the rural population and engendered illicit crop production have had a large impact on agricultural output growth.

The agricultural sector has suffered from poor policy choices and faces deep structural challenges. While it currently represents a key priority sector for the government, the institutional framework for agricultural policy has important weaknesses. Low productivity undermines the sector's competitiveness, largely driven by infrastructure deficiencies, unequal access to land and land use conflicts, as well as weak supply chains. Colombia's aim to boost its agricultural sector is closely linked to land tenure system and reparations to conflict victims in rural areas.

Innovation is vital for the competitiveness of the sector. While the government fully acknowledges its importance, the Colombian agricultural innovation system faces market imperfections, resulting in low private investment, under-supply of knowledge adapted to demand, and governance and capacity failures. These constraints limit adoption at farm

and firm level. There is a wide diversity of institutions funding and carrying out research, which define their own priorities and mechanisms to evaluate results.

Colombia's agricultural Producer Support Estimate (PSE) averaged 19% in 2011-13. A major component of this support is the Market Price Support (MPS) accounting for 81% of the PSE and is mainly generated by border measures. MPS is considered one of the worst forms of support, as it affects production, distorts markets and is less effective in increasing producer income. The average applied import tariff on agro-food products remains higher than for the other sectors. Colombia continues to use a price band mechanism in order to address fluctuations in world prices for a wide range of agricultural products. Budgetary transfers are another component of producer support in Colombia. These transfers have been relatively small and accounted for only 7% of the PSE in the period 1992-2011. However, in the period 2011-13 they rose significantly, reaching 19% of the PSE. Budgetary transfers, for the period 2011-13, have been dominated by payments based on output, particularly on coffee, and by payments based on variable input use.

To achieve its agricultural sustainable growth objective and overcome pressing structural challenges, Colombia needs to strengthen policies that support long-term competitiveness. Government resources should be committed to removing the significant deficiencies in the land tenure system, water and land management and infrastructure, plant and animal health and food safety systems, transport infrastructure, market information systems, education, research and development, extension services, technical assistance, etc. Furthermore, institutional arrangements are weak at the departmental and municipality levels, calling for improvements in the governance and co-ordination of agricultural policy. Colombia has also recently signed and enforced several Free Trade Agreements with key trading partners, under which it has committed to gradually phase out a wide range of agricultural border measures.

Support for agriculture should focus on long-term structural reform

- Re-focus policy efforts on strategic investments which are currently being under-provided such as public goods.
- Increase investment in irrigation and improve regulatory oversight over water supply, usage and storage. Increase investment in transport infrastructure.
- An inclusive land access policy in Colombia, while politically complex, is necessary to stabilise the country and to promote rural development.
- Upgrade the cadastre system. Accelerate the registration of land rights.
- Strengthen and improve the land tax system. This could be complemented by an assessment of the current land valuation system and of procedures for land transfer and acquisition.

Improve the institutional framework of agricultural policy

- Reform and strengthen the institutional framework for designing and implementing agricultural policies. Institutional representation at local level should be strengthened.
- Strengthen the evaluation and monitoring stages of the policy cycle. Improve the evidence base for policy decisions.
- Strengthen institutional co-ordination between the Ministry of Agriculture and Rural Development (MADR) and other relevant ministries implementing programmes in rural areas.

Reinforce the Agricultural Innovation System

- Reassess the framework for public and private investment in agricultural innovation. A longer term perspective should be adopted, including through longer-term funding arrangements.

Further integration into international agro-food markets

- Assess the effectiveness of the Andean Price Band System applied to key agricultural products.
- Strengthen the Sanitary and Phyto-Sanitary (SPS) system to support increased export competitiveness.

Chapter 1

Assessment and recommendations

This chapter presents the assessment and policy recommendations following from the analysis undertaken in the OECD Review of Agricultural Policies in Colombia. A key objective of Colombia's government is to boost the agricultural sector as an engine of economic growth and international integration. However, the sector faces a wide series of structural and institutional challenges that hinder this objective. To achieve its agricultural sustainable growth objective and overcome pressing structural challenges, Colombia needs to strengthen policies that support long-term competitiveness. Government resources must be committed to removing the significant deficiencies in transport infrastructure, land tenure system, water and land management and infrastructure, plant and animal health and food safety systems, market information systems, education, and research and development. At the same time, institutional arrangements are weak at the departmental and municipality levels, calling for improvements in the governance and co-ordination of agricultural policy.

Assessment

This Review, undertaken in close co-operation with the Colombian Ministry of Agriculture and Rural Development (MADR), assesses the performance of Colombian agriculture over the last two decades, evaluates Colombian agricultural policy reforms and provides recommendations to address key challenges in the future. The evaluation is based on the OECD Committee for Agriculture's approach that agriculture policy should be evidence-based and carefully designed and implemented to support productivity, competitiveness and sustainability, while avoiding unnecessary distortions to production decisions and to trade. The Review includes a special chapter focusing on agricultural innovation.

Colombia is richly endowed with natural resources that reflect its agricultural potential

Colombia is the fifth largest and the third most populous country in Latin America, with a surface of 1.1 million km² and a population of 47 million people. The country is the only South American country that borders both the Atlantic and the Pacific Oceans and is rich in terms of renewable and non-renewable natural resources, which include nickel, copper, iron, coal, natural gas, oil, gold, silver, platinum, and emeralds, as well as a rich vegetation and fauna. The diverse climate and topography permit the cultivation of a wide variety of crops and forest products. From the rugged hills of the Andean highlands, to the tropical Caribbean lowlands, agriculture in Colombia reflects the diversity of its landscapes and climates. Cultivation is also influenced by the various thermal floors. Colombia is abundant in agricultural land (43.6 million ha, representing approximately 39.5% of the total land area) as well as freshwater resources.

Reforms to date helped build a stable macroeconomic framework

In the early 1990s Colombia undertook a policy of economic liberalisation, which included the removal of quantitative restrictions on imports, removal of import licences, tariff reductions, reforms in foreign exchange market, deregulation of foreign investment, fiscal decentralisation, financial, tax and labour reforms, reforms of the pension system and of the health sector, and privatisation of public enterprises. After a period of significant economic growth, in 1998–99, Colombia's economy experienced a severe economic and financial crisis. Real GDP fell by 4.2% in 1999, but as of 2003 economic growth resumed. In 2008, Colombia felt the impact of the international financial crisis, but it recovered swiftly thanks to prudent macroeconomic management and strong commodity prices. Underpinned by the successful mining sector, with increasing commodity exports and investment as a result of rising commodity prices, growth recovered rapidly. Non-tradable sectors, such as transport, financial services and construction have also taken off. In contrast, manufacturing and agriculture have lagged behind.

Colombia's regulatory simplification efforts have led to significant improvements in the quality of the business environment and a more solid basis for private sector development

Box 1.1. Colombia: Contextual information

Table 1.1. Colombia: Contextual indicators, 1990, 2013

	1990	2013*
Economic context		
GDP (USD billion)	56	378
Population (million)	34	47
Land area (thousand km ²)	1 110	1 110
Population density (habitants/km ²)	30	42
GDP per capita, PPP (USD)	4 305	12 695
Trade as % of GDP**	21	30
Agriculture in the economy		
Agriculture in GDP (%)	16.7	6.1
Agriculture share in employment (%)	26.0	16.9
Agro-food exports*** (% of total exports)	37.6	11.4
Agro-food imports*** (% of total imports)	7.6	10.6
Characteristics of the agricultural sector		
Agro-food*** trade balance (USD billion)	2.4	0.5
Crop in total agricultural production (%)	62	59
Livestock in total agricultural production (%)	38	41
Agricultural area (AA) (million ha)	45	43
Share of arable land in AA (%)	7	4
Share of irrigated land in AA (%)
Share of agriculture in water consumption (%)	n.a.	60

n.a.: Not available.

* or latest available year.

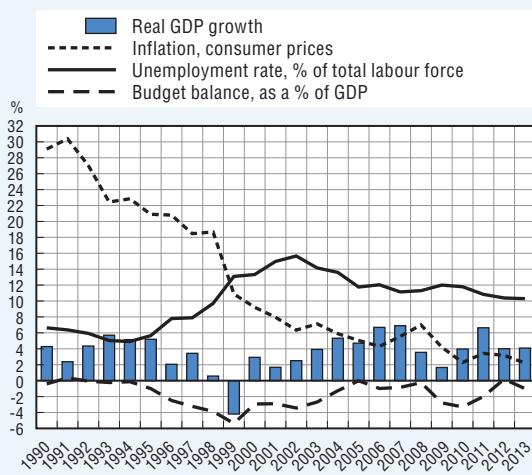
** ratio of the sum of exports and imports to GDP.

*** includes fish and fish products.

Source: DANE (2014); MADR (2014); UN Comtrade (2014); WB, WDI (2014).

StatLink  <http://dx.doi.org/10.1787/888933181243>

Figure 1.1. Main macroeconomic indicators, 1990-2013

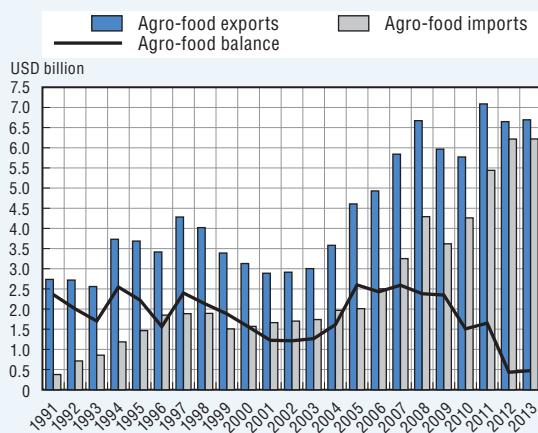


Note: Unemployment rates covering the 1990s decade are not fully comparable with the most recent data, as household surveys on which these are based covered initially only 13 cities, while they now report information at a national level. The budget balance refers to the general government.

Source: DANE (2014); IMF (2014).

StatLink  <http://dx.doi.org/10.1787/888933181221>

Figure 1.2. Agro-food trade, 1991-2013



Source: UN Comtrade (2014).

StatLink  <http://dx.doi.org/10.1787/888933181232>

and more diversified foreign investment. Colombia's short-term growth prospects remain strong, with an average of 4.8% growth foreseen for 2014-18 (OECD, 2015). However, in order to ensure sustainable and inclusive growth over the medium and long-term, the Colombian authorities are faced with three key structural challenges: boosting productivity across sectors, adjusting to the commodity boom and ensuring that this does not hinder the development of the non-mining sector, continuing reforms in both product and labour markets, and addressing the high level of income inequality (OECD, 2013a; OECD, 2013b).

Agriculture's share in GDP is declining, while it still represents an important contribution to employment

The share of agriculture in GDP declined from 16.5% in 1990 to 8.9% in 2000, and continued to decline at a more moderate pace over the next decade, reaching 5.2% in 2013. The share in employment also experienced a decrease from 26% in 1990 to 17.5% in 2013. If compared to the 1950s, when agriculture accounted for approximately 55% of total employment, the reduction in the share of employment has been considerable. Coffee has historically been the most important product in the Colombian agricultural sector. However, its relative importance has been decreasing, largely as an outcome of the country's development process but also as a result of the increased importance of other products, such as flowers, palm oil, fruit and vegetables, and livestock products. The increase in the share of the services sector and the boom in the mining sector have been matched by a fall in the share of coffee in both GDP and exports.

The social context is improving as poverty rates are declining, but the inequality rate remains extremely high

Two factors deeply affect the level and pattern of incomes in rural areas. On the one hand, forced displacement as a result of the armed conflict negatively impacted incomes because most of those displaced in rural areas earned their livelihoods in crop cultivation (CSPD, 2009). Second, linked to a weak performance of the sector, reflected by the sluggish growth of individual agro-food sub-sectors, agricultural incomes have been rising at a slow pace over the last 20 years. The steady economic progress over this period of time has nevertheless been accompanied by considerable reductions in the incidence of poverty, with rural poverty falling to 46.8% in 2012 from approximately 70% in 2001. Significant gaps remain however between the urban and rural areas, with urban poverty having fallen to 28.4% in 2012. Moreover, high levels of inequality are still a characteristic of the social and economic reality of the country (OECD, 2013b). The Gini index shows that income inequality in Colombia is above 50%, a pattern similar to other Latin American countries. Meanwhile, in contrast to regional peers such as Argentina, Brazil, Chile or Mexico, inequality appears higher in 2010 than at the beginning of the 1990s (57% compared to 52%) (World Bank WDI, 2013).

The agricultural sector has suffered from poor policy choices and faces deep structural challenges

For many years, governments in Colombia have not invested enough in the public goods and services that would allow the agriculture sector to realise its economic potential (MADR, 2014). This, combined with poor land management, unsuccessful land tenure reforms and a long-running internal conflict closely linked to drug trafficking, has deeply affected the evolution and performance of the Colombian agricultural sector.

The rural conflict has been largely responsible for the agricultural sector's weak development and the displacement of large numbers of the rural population. There has been a mutually reinforcing cycle of disputes related to land tenure, the failure of successive governments to address agrarian reform over several decades and armed conflict, which has weakened the sector considerably over a long period.

At present, support for agricultural producers takes the most distorting form, while general services for the agricultural sector have been neglected. Critical areas such as infrastructure, agricultural research and development (R&D) and agricultural knowledge transfer and farm restructuring continue to receive limited or zero support, although agricultural R&D received additional funding in the 2010s. Short term responses to the problems faced by agricultural producers have diverted scarce economic resources from the need to develop the enabling environment for more inclusive and sustainable agricultural growth.

Aspects of agriculture and rural development have been part of the National Development Plans (PND) since the 1990s. The strategic orientation given to agricultural policy over the past 20 years focused on enhancing agricultural production and competitiveness, particularly through support to agribusiness. Rural development policy has been oriented towards promoting equitable access to credit and land, as well as housing, basic sanitation, education and health. However, the orientations provided by such strategic documents were not reflected in the policy instruments implemented, which focused primarily on border protection and variable inputs subsidies. In the beginning of 2000s, the agricultural policy focus was directed on developing the competitiveness of various productive chains, but the policy instruments implemented still failed to properly address real structural challenges facing the sector.

Yet the institutional framework for agricultural policy has important weaknesses

A commitment to agriculture and rural development was the first concluded point of the peace negotiations between the government and the Revolutionary Armed Forces of Colombia (FARC) that started in 2013. The agreement reached in May 2013 includes issues such as access to and use of land resources, rural infrastructure and land adaptation programmes, social development, as well as incentives for agricultural development and food security. The 2010-14 government also implemented a legal and operational framework for the restitution of internally displaced people's land. The current government, which started its mandate in August 2014, set its objectives for growth in the agriculture sector in the context of the 2014-18 National Development Plan (PND) that will be submitted by the President to Congress during the first semester of 2015 for approval.

The institutional framework for designing and implementing agricultural policies is complex, with overlapping responsibilities between institutions and limited co-ordination. Different entities linked to MADR and other Ministries have responsibilities and functions with respect to broader agricultural sector development policies, such as rural public goods; however, responsibilities and functions are not always well defined among institutions, leading to fragmented funding, exacerbated by poor co-ordination. The capacity and reach of entities that are associated and linked to MADR appear to be limited, and institutional arrangements at the departmental and municipality levels seem weak.

While the sector is growing, low productivity undermines its competitiveness largely driven by infrastructure deficiencies and weak supply chains

Between 1990 and 2012, gross agricultural output (GAO) increased by 40% with livestock production rising by 88% while crop production rose only by 11%. Following strong annual growth between 2006 and 2008, the weather phenomenon La Niña in 2010-11 intensified the rainy season in Colombia (*ola invernal*) and severely affected the agricultural sector. As a result, in 2010 the agricultural sector suffered the most severe contraction of the last two decades, -4.5%. In 2011, growth picked up again and annual growth in the volume of agricultural production has averaged 1.6% since 1990. However, by comparison, Peru's average is 5.1% and Brazil's 4.1% (MADR, 2014; DANE, 2014; World Bank WDI, 2014).

Labour productivity in agriculture has been increasing since 1990, but the pace of growth has declined considerably since the mid-2000s. Within the region, other countries such as Brazil, Chile, or Peru have registered more solid increases in labour productivity. The growth of labour productivity in the industry sector – manufacturing and mining – has outpaced productivity growth in both services and agriculture sectors over the last decade (MADR, 2014; DANE, 2014; World Bank WDI, 2014).

Low productivity is a product of the structural weaknesses in the sector. The deficient stock and quality of infrastructure, as well as the structure of marketing systems, affects farmers' access to inputs and output markets. Colombia lags in transport infrastructure (roads, railroads and ports) in comparison with both developing and developed countries. A lack of long-term and multimodal planning has led to inadequate primary arteries between the main production centres and ports, undermining competitiveness and diminishing gains from international trade. The deficiencies in transport infrastructure and market information have led to the involvement of a large number of intermediaries along various product supply chains, weakening producers' position.

Unequal access to land and land use conflicts continue to pose a problem

Colombia, like other Latin American countries, has a highly dualistic distribution of land ownership, the roots of which can be traced back to the colonial era. The high level of inequality has been maintained over time by policy-related factors and ineffective programmes granting land access to small-scale farmers. In particular, the lack of a suitable land tax system has encouraged the accumulation of large estates for non-productive purposes or for extensive cattle farming activities. In addition, more than 40% of land ownership continues to be informal. Finally, agricultural land was also acquired through force by drug cartels or war conflict groups (MADR, 2014). A weak rural cadastre and a complex legal framework supporting the current land tenure system, together with the lack of an efficient land market and the unequal distribution of land ownership has led to significant inefficiencies in the utilisation of land and under-investment. The sector is dominated by small-scale units, with 67.6% of owners owning plots smaller than 5 ha (4.2% of agricultural land) and only 0.4% of owners holding land plots larger than 500 ha (representing nevertheless 46.5% of land) (IGAC, 2012).

Agricultural land in Colombia is either under- or over-exploited, highlighting the extent of the mis-allocation of resources. There is over-exploitation of land currently used for pasture; while only 13% of the total land is suitable, more than double this amount (31%) is actually used for pasture. Nearly one-quarter of land used for grazing is prime agricultural land that could be better used for growing crops, while land that ideally

would be conserved or left as forest is over-utilised for crops or grazing, resulting in erosion and destruction of forest and water resources. On the other hand, crop land is greatly under-exploited. The current surface used for crop land reaches 4.5 million ha, while it is estimated there are 21.5 million ha with such potential, meaning that only 21% of the area with crop land potential is actually used for such activities (Gruszynski and Jaramillo, 2002; Deininger et al., 2004; USAID, 2010; IGAC et al., 2012).

Challenges remain in the Colombian agricultural innovation system

The Colombian government has a stated commitment to strengthening the Colombian agricultural innovation system as a sustainable and inclusive driver of development. Efforts are being made to create an institutional framework that improves co-ordination and strengthens the linkages between entities, decision-makers and actors. However, the agricultural innovation system still faces numerous challenges. In terms of governance, there is no efficient mechanism to co-ordinate the priorities and activities of a wide range of institutions, which have different mechanisms for defining priorities, allocating funds and monitoring activities. The dispersion and limited scope of information also makes monitoring and evaluation difficult and incomplete, potentially leading to duplication of efforts. Moreover, it is difficult to identify systemic failures related to multi-purpose technologies and to propose solutions to these failures. However, on-going efforts to generate stronger links between the actors and to create mechanisms to match supply, including research, extension and technical assistance, with demand for agricultural innovation, should improve the situation (Corpoica, 2013).

In terms of resources, the public sector continues to be the main source of funding for agriculture R&D, whether performed by public or private organisations. However, public research intensity is relatively low, with public expenditure on agricultural research and development (R&D) accounting for about 0.6% of agricultural GDP in 2010-11. There is a diversity of sources for public funding of R&D activities in Colombia, which are complemented by significant contributions from parafiscal funds (producer associations' commodity funds) and royalties. A large part of funds is allocated to projects through open, competitive calls. This mechanism often results in resource allocations being driven by supply, i.e. offers made by researchers or research institutions.

In terms of co-operation, the co-financing model encourages co-operation between different institutions. However, competitive calls to projects may impede co-operation between researchers. Sharing of knowledge is facilitated through free access to knowledge policy (within the limits of Intellectual Property protection) and the development of a number of information networks. The multiplication of network databases, however, appears as challenging in terms of access to information by non-experts. There is a government strategy regarding international co-operation which ensures the dialogue at various levels of the agricultural innovation system, from policy to strategy to technical levels. For example, Colombia hosts a number of international research centres and is a member of international research partnerships and networks.

A major problem is the adoption of innovation by producers, which is limited by the unfavourable policy and structural environment, and insufficient capacity to absorb innovations that may not be adapted to small-scale agriculture and regional contexts. Investment support facilitates the adoption of innovation, with some programmes being targeted to small-scale farms. It would be crucial, however, to improve the supply of qualified workers for the agricultural innovation system by promoting agricultural

education and training, and to improve the provision of technical assistance to farmers. Technical assistance services have been frequently reformed over time, but they remain fragmented and there is no comprehensive framework that could ensure co-ordination of efforts, improve participation and exchanges of information and at the same time address territorial issues. However, the development of a general plan for rural technical assistance (PGAT) should improve the co-ordination of technical assistance services across regions.

Export competitiveness in the agriculture sector has fallen

Agricultural products were the main export items until the mid-1980s, accounting for 54% of the total value of exports of goods and services. The share dropped to 31% in 1987-99 and to 20% in 2000-05. Colombia has constantly been a net exporter of agro-food products during 1990-2013, but the agro-food trade balance has been reducing over recent years. The value of agricultural exports decreased in the aftermath of the global economic crisis and the rainy season of 2009-10 that severely affected agricultural production. Sharp currency appreciation during 2008-13, linked to the commodity boom, has also affected the competitiveness of the agricultural sector. Integration with international markets remains very low, both on the exports and the imports side, notwithstanding significant liberalisation of agricultural tariffs. Meanwhile, the ratio of agro-food exports in agricultural GDP represents almost double the ratio of total exports to total GDP (approximately 30% compared to 17%). On the other hand, the ratio of agro-food imports in agricultural GDP remains high compared to the ratio of total imports in total GDP (28% compared to 16%) (UN, 2014).

Producers have received relatively high levels of support over a long period dominated by market price support and input subsidies

The level of Producer Support, estimate as measured by the %PSE, was positive and stable in the period 1992-2013 (around 20%). For the period 2011-13, Colombia's PSE averaged USD 6.5 billion and agriculture support policies generated around 19% of gross receipts of agricultural producers. Producer support in Colombia is based on policy instruments that are most production and trade distorting and least efficient in increasing producer incomes. Variations in the PSE level have been driven mainly by fluctuations of its market price support component. When compared to other economies, Colombia's PSE for the period 2011-13, ranks slightly above the OECD average (18%), and among those with medium levels of support like Turkey (19%), EU27 (19%) and Indonesia (19%), but less than the levels of highly protected agriculture sectors like Japan (54%) or Norway (57%).

Market Price Support (MPS) is the predominant component of producer support in Colombia (90% on average for the period 1992-2013 and 81% for the last three years 2011-13). MPS is considered one of the worst forms of support, as it affects production, distorts markets and is less effective in increasing producer income (OECD, 2010; OECD, 2005). Products like rice, maize, poultry, sugar, milk, and pigmeat have received the largest share of MPS. This reflects Colombia's use of the Andean Price Band System (APBS) for some of these products (e.g. maize, rice, poultry, milk, sugar, and pigmeat). In spite of the reforms introduced at the beginning of the 1990s, Colombia has been applying APBS for thirteen key agricultural products since 1994.

Budgetary transfers are another component of producer support in Colombia. These transfers have been relatively small when compared to MPS levels and more or less constant, accounting, on average, for only 10% of the PSE from 1992 to 2013. However, over the last three years these transfers have increased markedly, reaching 19% of the PSE in the

Box 1.2. Overview of agricultural policy instruments applied in Colombia

Domestic policy instruments

Market price interventions: Price support for the majority of agricultural products is provided through border protection measures that include the use of the Andean Price Band System. However, there is a minimum guaranteed price for cotton introduced in 2001. The Price Stabilisation Funds are financed and administered by producer associations and function on the basis of transfers to and from farmers. Six products are covered by the funds: cotton, cocoa, palm oil, sugar, beef and milk.

Payments based on output: Coffee, rice, cocoa and milk farmers have received payments based on output over the last three years (2011-13), with the coffee support programme (PIC) being the most important in terms of outlays.

Variable input payments: The Rural Development with Equity (DRE) programme is currently one of the most important programmes for supporting the sector. The programme provides input subsidies, ranging from variable inputs like purchases of seed or renovation of crop plantations, to fixed capital formation such as subsidies for farm irrigation and drainage infrastructure, and on-farm services like subsidies for individual technical assistance. MADR has other specific resources under the commercialisation fund that provides input subsidies and promotion programmes of agricultural products. The Productive Alliances programme seeks to link smallholders with formal marketing structures. It finances productive investments and has components of variable inputs subsidies, fixed capital formation subsidies, on-farm services, as well as components of general services. Funds under the productivity improvement of agricultural and fisheries sector initiative, created in 2013, also provide multiple variable and fixed input subsidies.

Subsidised credit interest rates: Financing instruments relate to the access to credit and debt rescheduling. FINAGRO is a second-tier bank that provides funds to first-tier banks like Banco Agrario and private banks. Through this mechanism, farmers are able to access credit at preferential interest rates. Specific credit lines are for: i) working capital and marketing; ii) investment, which includes activities related to planting and maintenance, the purchase of livestock, the acquisition of machinery and equipment, land adequacy, infrastructure for agricultural production, aquaculture and fisheries, among others; iii) the normalisation of portfolios, which includes alternatives for farmers to adjust their financial debt. This includes debt restructuring (which applies to current loans), and refinancing and debt consolidation (which applies to current loans and overdue loans). Farmers also benefit from debt rescheduling and sporadic write-offs. FINAGRO also manages the Agricultural Guarantee Fund that provides collateral to farmers, particularly smallholders.

Insurance: Insurance instruments include three programmes. The first is the insurance policy for which the government subsidises up to 80% of the insurance prime. Second, the price hedge programme for maize producers consists in subsidising the cost of the hedge premium that the producer purchases. Lastly, the currency hedge programme for agricultural products in which the producers are guaranteed a purchasing price when there are fluctuations in the exchange rates.

Tax concessions: Agricultural production activities are excluded from taxes as well as land purchases, investments in irrigation systems, and commercialisation of agricultural products (MADR, 2014).

Box 1.2. Overview of agricultural policy instruments applied in Colombia
 (cont.)

General services provided to the agricultural sector as a whole

General services provision in Colombia includes agricultural knowledge generation and transfer, inspection and control, infrastructure (including land restructuring), marketing and promotion. These services are provided by MADR and its related entities, but also by other ministries like the Ministry of Environment and Sustainable Development, the Ministry of Mining and Energy, the Ministry of Transport, etc.

Infrastructure: INCODER manages the national fund for land adequacy or improvement that provides resources for the construction of irrigation and drainage infrastructure, flood control, as well water storage and regulation to protect and improve productivity in the sector. This is the most important programme in terms of off-farm irrigation and drainage infrastructure. AGRONET is an Internet website providing strategic, timely and concise information to the different stakeholders in the agricultural sector. CELUAGRONET is a programme through which agricultural producers can obtain information (input and output prices, weather conditions, and other key economic indicators for the sector) through text messages via mobile phones. There is also the Price Information System SIPSa that provides information prices for key agricultural commodities and inputs and the Climate Change Alert Systems.

Research and development: The agricultural R&D system is a complex network in which entities across various sectors participate to boosting the competitiveness of different agriculture supply chains. The objective of the system is to provide access to knowledge and technology.

Marketing and promotion: MADR has marketing programmes for several products such as milk, panela (product derived from brown sugar) and flowers. PROCOLOMBIA (Former PROEXPORT), an entity linked to the Ministry of Trade, Industry and Tourism, is also in charge of the marketing and export promotion of agricultural products. PROCOLOMBIA has a worldwide network with support offices across 21 countries and eight regional offices in Colombia.

Inspection services: Agriculture inspection and control policy is under the responsibility of MADR via the Colombian Agricultural Institute (ICA) for primary products and the Ministry of Health and Social Protection (MHSP) via the National Institute for the Surveillance of Food Products and Medicines (INVIMA) for processed agro-food products, as well as the Territorial Health Entities (ETS) for the commercialisation stage. CONPES 3375 of 2005 develops the general policy framework for the national agriculture inspection and control policy that includes a complete list of sanitary and phytosanitary measures applied in Colombia and the specific actions of different ministries related to the implementation of those measures.

Land restructuring programmes: A comprehensive land policy was launched through the National Development Plan 2010-14. This includes aspects such as land restitution to the victims of internal conflict, land tenure regularisation, comprehensive subsidies for land acquisition, land distribution, strengthening of peasant reserve zones, and development of productive projects. These policy actions are implemented by a range of different institutions, some of them recently created. This policy continues to be relevant for the new 2014-18 government.

Box 1.2. Overview of agricultural policy instruments applied in Colombia
(cont.)

Trade policy instruments

Import tariffs: As a member of the Andean Community (CAN), Colombia uses the CAN Common Tariff Nomenclature, which is based on the Harmonised System (HS). Tariffs applied in the agricultural sector have been much higher than in other sectors during the last two decades. The average MFN for agricultural products is 15.8% in 2012 compared to 5% for industrial goods. Colombia bound all of its tariffs in the Uruguay Round at rates varying between 15% and 227%. Colombia has been also applying the Andean Price Band System since 1994, a mechanism adopted by the Andean Community. The price band system covers 13 “marker” agricultural products and their related products.

Tariff Rate Quotas (TRQ): For a large share of agricultural products, import quotas have been distributed through the Public Mechanism for the Agricultural Quota Administration (MAC) created in 2004. MAC established the instruments under which quotas for countries other than the members of the Andean Community were to be allocated with a preferential tariff for selected agricultural products. During 2006-10, tariff quotas were notified to the WTO for meat, dairy, grains and cereals, soybeans, oils and fats, and cotton. In practice, Colombia did not make use of these quotas as the applied tariff was below the intra-quota tariff. The MAC cannot be applied in a way that is incompatible with the FTAs currently in force. Tariff rate quota allocation has been negotiated in the various FTAs signed by Colombia.

Safeguards: Colombia has reserved the right to apply the special safeguard clause in the WTO Agreement on Agriculture to 57 four digit tariff headings, but has not made use of this so far. Special Agricultural Safeguards are used with respect to trade agreements for specific products, which by their sensitivity are considered vulnerable in front of external competition. In 2013, as a result of producer protests, safeguard quotas were implemented for the following two years against several products with origins from the Andean Community (CAN) member countries Peru, Bolivia, Ecuador, and MERCOSUR, primarily Argentina, Uruguay and Brazil: fresh potatoes, pre-cooked and frozen potatoes, onions, dried beans, peas, tomatoes, pears, powder milk and whey.

Import licensing: Colombia currently applies an automatic licensing system, referred to as “free importation”, as well as a non-automatic licensing system, known as “prior licensing”. Licences are applied irrespective of the origin of the product in question. A prior or an automatic license is needed to import some agricultural goods subject to quota in respect of quantitative safeguards; goods subject to sanitary controls aimed at preserving human, plant and animal health; and fishery resources. Any authorisation or permit required for the goods to be imported, such as sanitary or phytosanitary certificates must be obtained before applying for the import licence.

SPS and food safety: The Colombian Agricultural Institute (ICA) and the National Institute for the Surveillance of Food Products and Medicines (INVIMA) are each responsible for the issuance of import sanitary permits for different categories of agricultural products. Non-processed products that are fresh or frozen require a sanitary permit only from ICA and do not need to be registered with INVIMA. ICA is also responsible for the issuance of import sanitary permits for agricultural inputs, including seeds. INVIMA handles sanitary aspects related to processed food trade.

Source: MADR (2014).

period 2011-13. The spectrum of policy instruments has been dominated by payments based on variable input use, but in 2013 large transfers based on output were given to coffee producers. This increase can be explained by the producer protests of 2013.

General services for the agricultural sector have been neglected for the past two decades. Critical areas such as infrastructure for agricultural production and marketing, agricultural knowledge and agricultural knowledge transfer, and farm restructuring have received limited or no support. This limited support has been mostly allocated to the development and maintenance of infrastructure within the GSSE, accounting for 66% of total GSSE expenditures. Other important shares in GSSE outlays are agricultural knowledge and innovation systems with 28% and inspection and control services accounting for 6%. For 2012-13, the start of a potentially positive trend is starting to be observed, as outlays directed to infrastructure programmes have risen.

Total support to agriculture is high relative to the overall economy

The level of total support (TSE) provided to agriculture in 2011-13, was 1.8% of GDP, more than twice the OECD average of 0.8%. Colombia's figure is lower than that of China (2.3%) or Indonesia (3.4%), but much higher than that of Mexico or Brazil (0.7% and 0.5% respectively), and is roughly comparable to that of Korea (1.9%).

Policy recommendations

A key objective of the current Colombian government is to boost the agricultural sector and transform it into an “engine” of economic growth and poverty reduction. The country is well endowed with land and water resources, but pressing structural reforms will be required to accelerate improvements in productivity and competitiveness, and to facilitate the exploitation of the export opportunities provided through Colombia's FTAs. Colombia's aim to boost its agricultural sector is also closely linked to land tenure reform and reparations to conflict victims in rural areas.

Productivity growth is a prerequisite for sustained competitiveness and integration into international agro-food markets and is thus critical for agricultural development. The policy reforms proposed below for consideration by the government are designed to support increased agricultural productivity, competitiveness and sustainability. These are not exhaustive and are derived from the analysis undertaken in this Review. They should thus be interpreted as a starting point for government consideration, refinement, and further elaboration.

Support for agriculture should focus on long-term structural reform

The challenges faced by the Colombian agricultural sector remain structural in nature. There should thus be a strong focus on building a comprehensive enabling environment for the agricultural sector. A thorough review and impact assessment of the wide array of policy instruments and programmes to support agriculture is advised. This will allow the redefinition and reorganisation of policy instruments. Such an assessment should include the programmes that are being implemented by private producer associations with government outlays. In particular, there should be an effort to:

- Re-focus policy efforts on strategic investments which are currently being under-provided, as shown by the Total Support Estimate calculations: public goods, a national and functional extension/training and technical assistance system that fosters technology transfer,

strong R&D and innovation capacity of the sector, animal and plant health protection and control services, promotion of sustainable use of natural resources, support to small-scale farmer associations for commercial purposes. Without adequate investment in these areas it will be very difficult to improve productivity, competitiveness and ensure the sustainable development of the sector. This requires strengthening the financial capacity not only of MADR, but also of other ministries providing public services to the rural areas.

- *Redirect budget outlays away from production- and trade-distorting policy instruments such as direct payments based on output and input subsidies which are costly, inefficient and largely ineffective in building sustainable growth and competitiveness in the sector.*
- *Increase investment in transport infrastructure.* In most rural areas there is a lack of adequate stock and quality of secondary and tertiary roads. There are also unexploited opportunities in internal river transportation that could reduce the costs associated with moving agricultural goods from production to consumption centres and major ports.
- *Increase investment in irrigation and improve regulatory oversight over water supply, usage and storage.* Higher irrigation coverage and rehabilitation are needed and policies should be put in place that create incentives for investment in the operation and maintenance of irrigation infrastructure. This should be supported by a more effective regulatory regime for agricultural water supply, storage and usage which encourages institutional co-ordination. An assessment of long-term trends in water demand within the agricultural sector that provides a basis for future investment in irrigation infrastructure is also required.
- *Carefully monitor credit programmes to avoid moral hazard in credit programming.* Evaluations of the co-operation framework between the second-tier financial institution FINAGRO and retail financial institutions having a direct relationship with farmers should be conducted. Moreover, in terms of subsidised credit rates, within the recent context, debt write-offs have or will be implemented on a very large scale. These need to be avoided and careful attention should be paid to assessing the impacts of such financing models.
- *Strengthen the market information system to provide domestic and international input/output information, as well as important information on the sector at the national, departmental and municipal-communal level.* The 2014 Agricultural Census should provide much of the necessary information.
- *Focus also on broader rural development policies.* The improvement of human capital and the development of regional and rural infrastructure can support the diversification of economic activities in rural areas and contribute to increasing incomes.

Improved land rights and utilisation should contribute to long-term growth in the agriculture sector

An inclusive land access policy framework in Colombia, while politically complex, is necessary to stabilise the country and to promote rural development. Colombia faces the twin challenges of high concentration of land ownership and the under-exploitation of arable land. Past efforts at land access have in practice had little or no impact on the distribution of land and its use. Most recently, peace negotiations with FARC have brought land reform to the forefront of the political agenda, with increased budgetary allocations in support of a government priority of creating more equitable access to rural land. In 2011 the government passed the Victims and Land Restitution Law, a vast land titling and

redistribution law. The government is also seeking to address the under-utilisation of land to boost growth in the agriculture sector.

- *Upgrade the cadastre system.* A functional rural cadastre (a comprehensive register of state property) must be the starting point to any further actions concerning land, as the existing information is outdated and incomplete. A reformed system should be capable of centralising information across municipalities and departments that can be updated permanently.
- *Accelerate the registration of land rights.* As more than 40% of land ownership continues to be informal, it will be important to speed up the process of formalisation, while strengthening the protection of existing land rights. This will provide incentives for better use of land according to its suitability and sustainability and attract private investment.
- *Adjust the sequencing of land market transactions between the registration and the cadastre.* Currently, any buyer can register a land plot without validating its extent and geographic characteristics with the cadastre since this is done after the registration. This generates a high risk of potential conflicts over land and weakens the capacity of the government to properly secure the rights of land buyers.
- *Simplify the land tenure system and clarify the responsibilities of the different related agencies.* The institutions that underpin property rights, facilitate transactions, make land markets transparent and foster land taxation suffer from many weaknesses. The implementation of laws and regulations related to land tenure requires the support of many entities from the level of central government to territorial authorities, but these relationships are currently rigid. The system would benefit from increased transparency at all levels.
- *Strengthen and improve the land tax system.* This could be complemented by an assessment of the current land valuation system and of procedures for land transfer and acquisition. Removing the distortions in the current system of taxes and transfers and moving to a more progressive level of land taxation should encourage more productive use of land away from speculative land accumulation.
- *Undertake land suitability assessments.* Land use plans, already required to be put together by all local governments, provide a basis on which further efforts in this regard can be built. They should draw on the information provided by the results of the 2014 Agricultural Census, which will be an instrumental tool for properly mapping farm structure and characteristics according to regions, commodities produced and assets.
- *Provide appropriate support services to land restitution schemes to facilitate land access to farmers, particularly smallholders.* These could include access to financial instruments, strengthened contract enforcement, and specific assistance to the rural poor. Well-functioning rental markets can be an alternative route to access land.

Improve the institutional framework of agricultural policy

- *Reform and strengthen the institutional framework for designing and implementing agricultural policies.* The capacity and reach of entities at the central level that are associated and linked to MADR should be strengthened. This includes the human and financial capacity to implement agricultural policies. There is also the need to adjust communication channels so that MADR can co-ordinate and plan interventions at the departmental level (with the secretaries of agriculture) and its institutional executing agencies. Without this

co-ordination and proper channels of communication it is very unlikely that strategic interventions across the agricultural sector will be achieved.

- *Institutional representation at local level* (departments and municipalities) should be ensured, together with a flexible structure of policy design and implementation between the central government and the local level. The timeframes for budget planning and execution should also be harmonised between the central, departmental and local levels.
- *Strengthen the evaluation and monitoring stages of the policy cycle.* A more comprehensive and coherent system of monitoring, analysing and reporting of Colombia's agricultural policies will help assess and improve policy performance. There is a need for a systematic evaluation of agricultural policies impacts, as budgetary spending is increasing and it is not in itself a guarantee that the policies implemented are effective. Evaluation programme methodologies like randomised control trials (RTC) could be useful.
- *Improve the evidence base for policy decisions.* Currently, statistical data at farm level is far from accurate and thus the use of statistical information for policy formulation is insufficient.
- *Strengthen institutional co-ordination between MADR and other relevant ministries implementing programmes in rural areas.* Responsibilities and functions of different agencies need to be clarified in order to ensure proper co-ordination and financing of such actions. Stronger co-operation between MADR and the Ministry of Environment and Sustainable Development (MADS) is needed to reduce overlap and improve synergies in agro-environmental policy. The responsibilities of managing investments and maintenance of agriculture-related transportation networks and other rural public goods should be harmonised between MADR and the relevant ministries and agencies overseeing such works alongside with departments and municipalities.
- *Strengthen the interaction between policy makers and stakeholders at all stages of the policy process at both central and regional levels.* The involvement of stakeholders at all stages of the policy process (identifying the issues of policy concern, the formulation of policy objectives, making new policy proposals) will allow for a more pro-active dialogue between the government and the relevant stakeholders. Information about all policies should be made publicly accessible.

Reinforce the agricultural innovation system

- *Reassess the framework for public and private investment in agricultural innovation.* A longer term perspective should be adopted, including through longer-term funding arrangements. It is necessary to establish a budgetary rule for allocating public funds to research and development in the agricultural sector and thus ensuring the continuity of investment in science, technology and innovation. Funding for agricultural research should be increased, through direct support and incentives for private investment. Demand driven allocation mechanisms (pull mechanisms) must be more intensively used in this sense, thus giving users a more prominent place in the system.
- *Review strategic plans on a regular basis, taking evaluation results into account.* The quality, coverage and appropriation of evaluation results should be improved. Evaluation mechanisms are in place but evaluation is mainly based on research output, quality is limited by deficiencies in information specific to agriculture (missing or not

consolidated) and the little consideration given to impact analysis. Therefore, evaluation results cannot fully inform policy makers.

- *Improve co-ordination between national, regional and local levels of decision-making and implementation.* Existing institutions need to be provided with the means to exercise effective co-ordination between general and agricultural innovation systems. Co-ordination mechanisms should ensure that demands from different regions and farming systems are taken into account.
- *Continue to improve information collection and dissemination.* Information systems, as well as tools for the evaluation of impact should be consolidated. This can be done, for example, through the Siembra platform. Access to information must be improved for all users, including small and medium enterprises (SMEs) (through agreements).
- *Further strengthen the Intellectual Property Rights (IPR) system.* Patent protection remains lower than in most developed countries, while plant variety protection is co-ordinated at the Andean level. Colombia did not sign the most recent international agreement (UPOV91). Efforts should continue to be made in sharing information and assisting researchers in handling their IPRs. Strengthening IPRs can also provide further incentives to the private sector for investing in agricultural R&D.
- *A better use of ICTs that would provide more comprehensive and inclusive services.* Public efforts on new, general purpose technologies, such as biotechnology, nanotechnology and ICTs must be reinforced, possibly in the framework of international partnerships.
- *Make agricultural education more attractive.* There is a shortage of qualified labour in the overall agro-food system and it concerns skills that require higher education as well as skills that require technical training. This situation impacts on the activities of both agri-businesses and public and private entities providing services to agriculture. The attractiveness of agricultural education is of course mainly driven by the levels of agricultural income relative to other sectors. Nevertheless, a series of policies could also play a role in increasing attractiveness, including: better information about available programmes, institutional public-private partnerships, and increased funding for agricultural programmes.
- *The co-ordination and coverage of technical assistance services must be improved,* while addressing other issues that impede investment, such as land tenure, infrastructure, and access to finance.
- *Small farmer issues, including the delivery of technical assistance, should be addressed within a comprehensive framework.*

Further integration into international agro-food markets

- *Assess the effectiveness of the Andean Price Band System applied to key agricultural products.* An assessment of the actual effects of the Price Band System could provide the basis to assess whether alternative policies can achieve the socio-economic objectives set for the sub-sectors covered by the price band. Moreover, the FTAs signed and enforced by Colombia in recent years foresee a gradual phase-out of its application in relation to its main trading partners. However, the agricultural MFN tariffs remain much higher in Colombia. At the level of the Andean Community, food security is currently set out as a key pillar of integration. Trade can be an essential part of food security strategy and Colombia could thus pursue an active role in the dialogue taking place at the level of the Andean Community.

- *Increase transparency in the application of border measures.* Colombia should improve transparency in the application of agricultural border measures, by ensuring the predictability and timeliness of information. Information on border measures, such as changes in the application of the Andean Price Band System or agricultural safeguards, should be provided to all relevant stakeholders with an appropriate time interval between publication and entry into force, as well as accompanying documentation. Inconsistent and unpredictable import measures can reduce the incentives to trade and invest in Colombia, particularly within the context of the increasing importance of global agro-food supply chains.
- *Strengthen the Sanitary and Phyto-Sanitary (SPS) system to support increased export competitiveness.* The SPS system would benefit from strengthened inspection capacities along the supply chain, as well as from an assessment of the institutional framework, including the clarification and simplification in the responsibilities of the two related agencies ICA and INVIMA.

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PART I

The agricultural policy context in Colombia

PART I

Chapter 2

General characteristics of Colombia's economy

This chapter outlines the geographic, demographic and political characteristics of Colombia. Colombia is the fifth largest and the third most populous country in Latin America, with a surface of 1.1 million km² and a population of 47 million people. The country enjoys a privileged geographical position being the only South American country that borders both the Atlantic and the Pacific Oceans and is rich in terms of natural resources. The chapter goes on to look at the macroeconomic performance of Colombia and its socio-economic context. In the early 1990s, ambitious economic liberalisation reforms were undertaken. However, in 1998-99, Colombia's economy experienced a severe economic and financial crisis, which triggered a series of reforms that fostered macroeconomic stabilisation and spurred growth. The chapter also considers the characteristics of the business environment and identifies infrastructure challenges.

Political and demographic characteristics

The Republic of Colombia is a presidential representative democratic republic, established under the Constitution of 1991. The President of the Republic is the chief of state and head of the government and is elected to serve four-year terms. The bicameral Congress of the Republic includes the 166-seat Chamber of Representatives and the 102-seat Senate. The Supreme Court reviews state and municipality laws, frames bills to be submitted to Congress, and proposes reforms (UN, 2007; Hudson, 2010).

Colombia has a **surface area** of 1.14 million km² (of which 1.1 million km² are land), making it the fifth largest country in Latin America following Brazil, Argentina, Mexico and Peru, and the twenty-sixth largest in the world. Colombia is the only South American country that borders both the Atlantic and Pacific Oceans. Colombia can be divided into five regions (Table 2.1). Most of Colombia's population and the four largest cities are found in the Central (Andean) region (FAO, 2006; FAO and CAF, 2006).

Colombia's territorial and **administrative organisation** includes departments, districts, municipalities, and indigenous entities. The 1991 Constitution identified decentralisation, departmental autonomy, and citizen participation as the three fundamental principles of the administrative organisation of the country. As a result, a number of administrative functions previously controlled by the central government were transferred to the local level. The Constitution recognises 32 departments and the capital district (*Distrito Capital de Bogotá*) (UN, 2007; Hudson, 2010). Figure 2.1 shows the general configuration of Colombia's Central (Andean), Atlantic (Caribbean), Pacific, Oriental, and Orinoco-Amazon regions.

Table 2.1. Configuration of main regions by departments

Region	Departments
Central (Andean)	Antioquia, Caldas, Caquetá, ¹ Huila, Quindío, Risaralda, Tolima
Atlantic (Caribbean)	Atlántico, Bolívar, Cesar, Córdoba, La Guajira, Magdalena, Sucre, San Andrés y Providencia ²
Pacific	Cauca, Chocó, Nariño, Valle del Cauca ³
Oriental	Boyacá, Cundinamarca, Meta, ⁴ Santander, Norte de Santander
Orinoco-Amazon	Amazonas, Arauca, Casanare, Guainía, Guaviare, Putumayo, Vaupés, Vichada

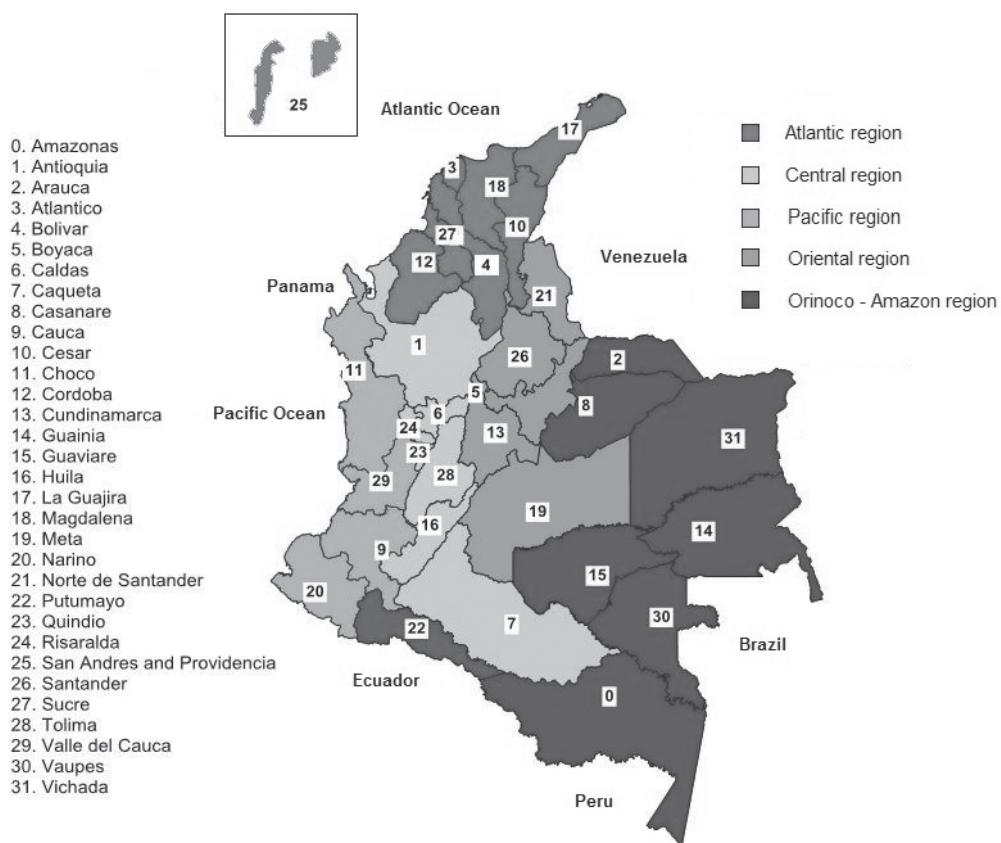
Note: There is no single official grouping of regions. Departments are grouped here based on National Administrative Department of Statistics (DANE) and Ministry of Agriculture and Rural Development (MADR) information, as used for various national surveys and analyses, including the *Gran Encuesta Integrada de Hogares*, a household survey that provides many of the regional statistics for this study.

1 and 4. Caquetá is included in the Central region and Meta in the Oriental region, as they have been already grouped in this way for data collection purposes within the Extensive Household Survey (*Gran Encuesta Integrada de Hogares*). Statistics from this survey are used throughout the document.

2 and 3. To simplify the groupings, the department of San Andrés and Providencia is included within the Atlantic region and the department of Valle del Cauca within the Pacific region.

Source: Authors' grouping of regions and departments based on discussions with DANE and MADR.

Figure 2.1. Map of Colombia: Selected configuration of main regions by departments



Note: There is no single official grouping of regions. Departments are grouped here based on discussions with MADR and DANE information used for various national surveys and analyses.

Source: Map shape received from MADR and edited by authors.

Colombia is the third most populous country (47 million people in 2013) in Latin America, after Brazil and Mexico. In 2007, approximately one third of the population was concentrated in the four main cities: Bogota, Medellin, Cali, and Barranquilla. Whereas Colombia had one of the highest population growth rates in the world before 2000, the fertility rate has fallen by about 45%, in part as a result of well-organised family-planning programmes (Hudson, 2010). Colombia has a relatively **young population**: the median age in 2008 was estimated at 26.8 years. The rural population is younger than the urban population but the gap has been closing.

The Colombian urban-rural picture is complex. Beginning in the 1940s, internal conflicts caused massive displacements of the rural population. Between 1985 and 2011, more than 5.4 million persons were internally displaced (CODHES, 2012). Most of the displaced are concentrated in areas bordering Ecuador and Venezuela, as well as in parts of the Pacific Coast. The vast majority of these people relocated to urban areas; this partly led to the creation of massive informal urban settlements, which lack property security and basic infrastructure. The move to these urban areas marked not only a flight from the violence but a shift away from agricultural activities (Hudson, 2010; USAID, 2010).

Following the definition of the National Administrative Department of Statistics (DANE),¹ Colombia has a largely **urban population**, with three-quarters of inhabitants living in cities in 2013, a rise from the 68% recorded at the beginning of the 1990s (DANE, 2013). However, according to the UNDP's "Rurality Index", which measures **rurality** on a continuum (i.e. municipalities can be "more" or "less" rural, rather than being one or the other) by combining municipalities' demographic densities with their distance from population centres, three-quarters of Colombian municipalities covering almost 95% of the country's land area and almost one third of the population can be characterised as rural (UNDP, 2011).

Colombia is a **multi-ethnic** and multi-lingual country and includes four officially recognised **ethnic groups**: the indigenous population, the *raizal* population, the black or Afro-Colombian population, and the Rom (gypsy) population (DANE, 2005). The Constitution recognises 82 communities as indigenous territorial entities with councils that exercise jurisdiction in accordance with their own customs (UN-Habitat, 2005).

The average national population **density** (inhabitants per square kilometre) has increased during the last two decades, from 30 per km² in 1991 to 42 per km² in 2011 (WDI, 2013). The majority of the population is concentrated in the Andean highlands and valleys, followed by the Caribbean lowlands. In some departments in the Amazon region, there is fewer than 1 person per km² (Hudson, 2010).

Colombia has a high adult literacy rate of 93.4% (WDI, 2013). In 2011, 87% of children were enrolled in primary **education**, while secondary enrolment was reported to be 76%. There is an estimated participation rate of 43% in tertiary education, a higher rate than in some Latin American countries such as Brazil (25%) or Mexico (28%) but lower than in Argentina (75%) or Chile (66%) (WB WDI, 2013). Innovative programmes, characterised by flexible plans that allowed pupils in rural areas to make progress according to their own capabilities and circumstances, reduced the dropout rate and improved results (Kline, 2002; Hudson, 2010). Nevertheless, levels of education in rural areas still lag behind those in urban areas (Gallarza et al., 2007).

Natural resources and climatic conditions

The country is extremely rich in terms of renewable and non-renewable **natural resources**. These include natural gas; precious metals; nickel, copper, and iron ore; and rich vegetation and fauna. It is the region's fifth largest producer of crude petroleum and has been a net oil exporter since 1986. It also has the largest coal reserves in Latin America (Hudson, 2010; USAID, 2010).

Due to its proximity to the equator, Colombia's **climate** is tropical and isothermal. Its six natural regions vary significantly – tropical rainforests, tropical savannahs, steppes, tropical deserts and tropical mountain climate – according to altitude, temperature, humidity, winds and rainfall. The most productive land and the majority of the country's population can be found at altitudes between 900 m and 1 980 m, in the temperate land (*tierra templada*), where rainfall is moderate; and between 1 980 m and 3 500 m, in the cold land (*tierra fría*), where the average temperatures range between 10 °C and 19 °C. The *tierra fría* constitutes just 6% of the total area, but supports about one-quarter of the country's population (FAO, 2006).

Colombia is the world's fourth most "mega-diverse" country, hosting close to 14% of the planet's **biodiversity** (CBD, 2013). Over one-half of Colombia's territory is covered by

forests, 87% of which are primary forests, which gives Colombia one of the largest areas of primary forest in the world. Nationally protected areas represent about one-quarter of the total land area (ITTO, 2006; USAID, 2010).

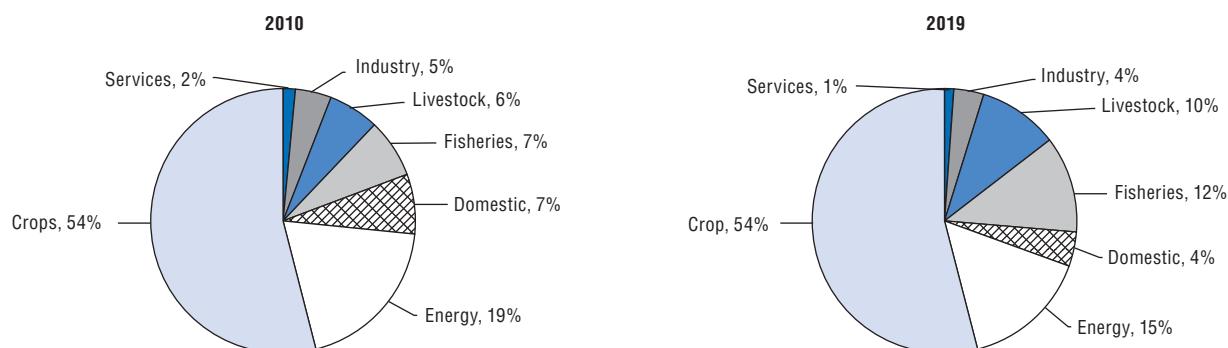
Water resources

Colombia has extensive freshwater resources. Renewable water resources are estimated at 44 836 m³/capita/year, less than in Peru or Chile, but more than in Brazil, Argentina, or Mexico (FAO AQUASTAT, 2012). The average rainfall is about 3 000 mm/year, although annual rainfall varies widely across the country, reaching up to 9 000 mm/year along the Pacific coast.

The most important river system is the Magdalena, which flows northward between the Central and Eastern Andes to empty into the Caribbean Sea; its basin, including that of its major tributary, the Cauca, covers a quarter of the country's territory. More than three-quarters of the country's population and most of the country's socio-economic activities are located along its course. Colombia is second to Brazil in Latin America in terms of hydroelectric potential (FAO, 2006; Hudson, 2010). Most of Colombia's water resources are located in areas with low population levels: only 15% of the total water supply is available in the Andean region, where the greater part of the population lives (INCODER, 2012).

Seasonal and spatial variation in rainfall and lack of adequate storage create competition between user sectors (FAO AQUASTAT, 2012). Agricultural activities were estimated to consume 60% of available water resources in 2008, a figure projected to reach 64% in 2019 (Figure 2.2) (IDEAM, 2010). Five crops – coffee, maize, rice, plantain, and sugar – account for more than 50% of the water footprint in agricultural production (Arévalo et al., 2012). Urban water systems encounter difficulties in meeting demand (OECD/ECLAC, 2014; IDEAM, 2010).

Figure 2.2. Water use by sector, 2010 and 2019 projections



Source: IDEAM (2010), "Estudio Nacional del Agua".

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Colombia has approximately 900 000 ha of **irrigated** agricultural land (approximately 2% of the overall agricultural area) (WDI, 2013). There are 25 large-scale irrigation districts covering an area of 235 500 ha and 534 small-scale irrigation districts covering an area of 39 838 ha, mostly in the Central region. Irrigation infrastructure constructed by the private sector covers around 625 000 ha of mostly perennial crops (CGR, 2009). It is estimated that the area of land suitable for irrigation is six times higher than the area currently under irrigation. Public investment in irrigation was especially prominent in the first half of the

20th century. During the second half, however, due to fiscal shortages and the inability to raise sufficient revenues from water charges, the Colombian government devolved irrigation management responsibility to water users associations (INCODER, 2012). Ninety-five per cent of irrigated areas use surface water, which restricts opportunities to expand irrigation to other areas and contributes to soil deterioration and erosion, which affects agricultural yields (USAID, 2010).

Infrastructure

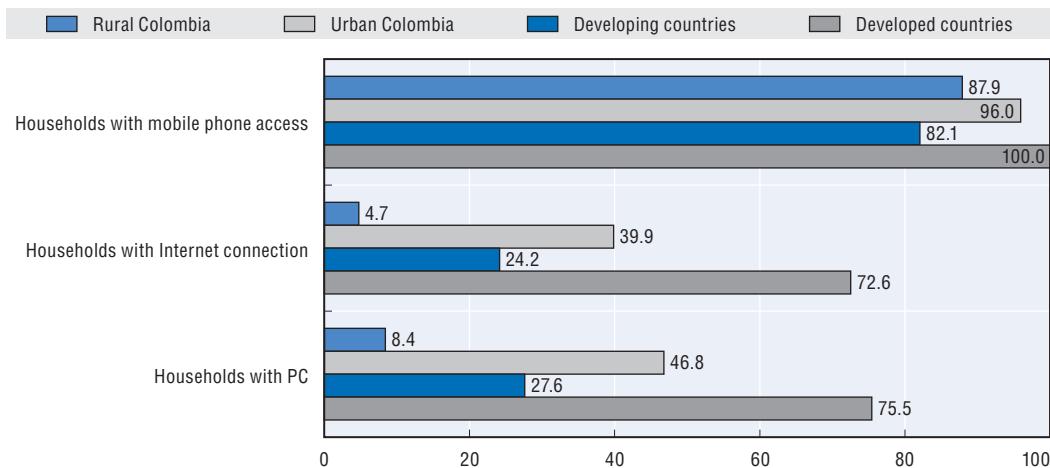
In 2012, Colombia had a road network of approximately 214 946 km (Ministry of Transport, 2013). The primary road network is concentrated in the Andean and the Atlantic regions, facilitating the connection between the country's main production centres and its key ports. In contrast the geography of the Orinoco-Amazon region favours river and air transport. The total road density was approximately 19.4 km/100 km² of land area in 2012. Highways are used to transport the majority of general cargo; however, the primary road network is poorly developed in an east-west direction. Only 14% of Colombia's total road network is paved, compared to 23.3% in Chile and 36.4% in Mexico (WDI, 2013). Secondary and tertiary roads networks, which are crucial for agricultural commercialisation and rural development, form the main transportation bottleneck in most rural areas: one fifth of the secondary road network and one third of the tertiary network are characterised as "bad" (i.e. inadequate and unpaved) (Ministry of Transport, 2005; Yepes et al., 2013). Furthermore, the lack of ex-ante feasibility and in general ineffective prioritisation and planning have hampered transport infrastructure (Nieto-Parra et al., 2013). In particular, private sector involvement in transport infrastructure has suffered from weaknesses in regulatory and institutional designs (Bitran et al., 2013). To tackle this problem, the overall regulatory and institutional framework of PPPs has improved recently.

Other transport networks are also inadequate or under-utilised. For example, Colombia had approximately 940 km of operational railways in 2012 (Ministry of Transportation, 2013). In contrast, Argentina, Brazil and Mexico have more than 25 000 km of railways (World Bank WDI, 2013). Similarly, while the Magdalena River is the central communication cord between the Andes and the Caribbean coast, only 4.4 million tonnes of cargo – mostly fuels and related products – are transported on the river (SAC, 2004). In comparison to its regional peers, goods and services travel large average distances – 280 km – from the main production areas to Colombia's main ports. This is about three times the averages for Brazil and Chile, and six times that for Argentina (World Bank, 2008).

Colombia's **information and communication technology** (ICT) has improved significantly in recent years but remains underdeveloped in rural areas. The mobile phone network has expanded rapidly (98% of the population uses a mobile phone). Only 40% of the population, however, has access to the Internet (World Bank WDI, 2013). Access rates in rural areas are generally much lower (Figure 2.3) (DANE, 2013).

Access to **electricity** is high (94% of population in 2009), but remains lower than in Argentina (97%), Brazil (98%) or Chile (99%). Access to water and sanitation systems, as well as their service quality, remain poor. Fewer than two-thirds of rural households were connected to improved water sources and fewer than three-quarters had access to improved sanitation in 2010 (World Bank WDI, 2013). The poorest groups often lack adequate sanitation and water supply services. The absence of sewerage systems in one-fifth of urban centres is a serious environmental problem (World Bank, 2006).

Figure 2.3. Percentage of the population owning a computer, Internet and mobile phone, 2012

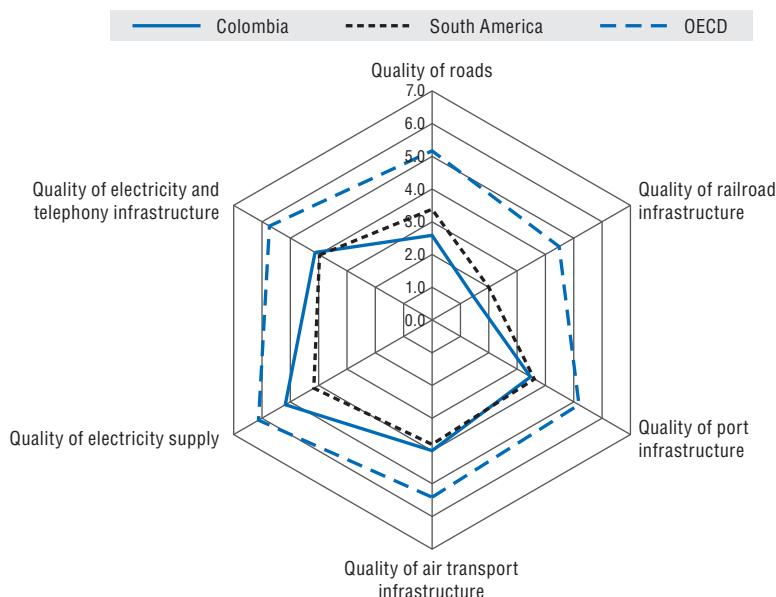


Source: DANE (2014); International Telecommunication Union (ITU) (2014).

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The quality of **infrastructure and logistics** in Colombia also remains poor in comparison to other South American countries such as Argentina, Brazil or Chile, and is below the OECD average (Figure 2.4). Overall, Colombia ranks 108th out of 144 countries with respect to the overall quality of its infrastructure (WEF GCR, 2013). The main reason for the poor transport infrastructure is the low level of investment, both public and private. On the one hand, public investment in infrastructure has been poor historically; on the other, private investment has not been sufficiently encouraged, mainly due to institutional factors. Most local and territorial entities and authorities do not have the planning, management, and investment capacity to develop their own infrastructure.

Figure 2.4. The quality of infrastructure, 2013



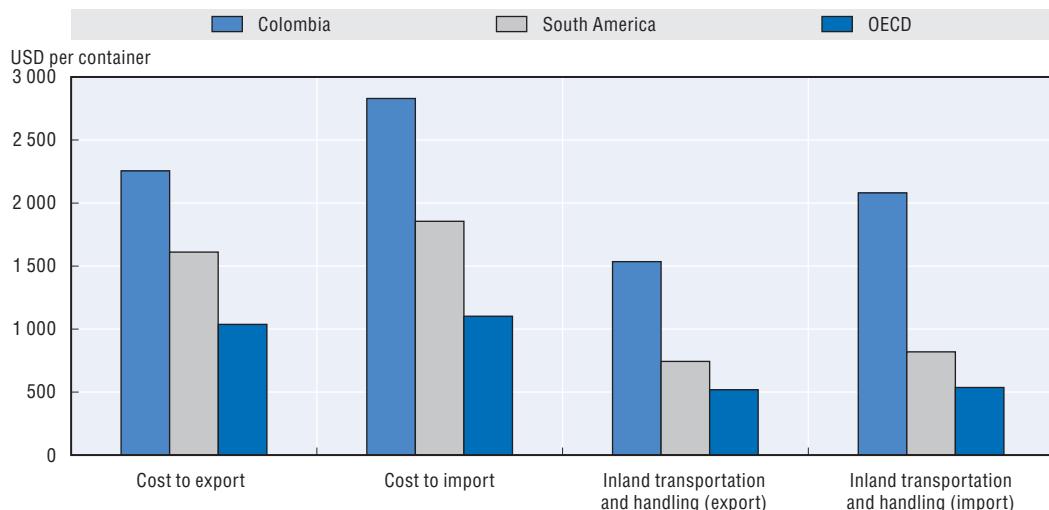
Note: The indicators are on a scale of 0 to 7, where 7 indicates the best performance.

Source: Authors' calculation based on data from the World Economic Forum Global Competitiveness Report (2013).

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The transport infrastructure gap results in very high commercialisation costs. The Strategic Transportation Plan 2003-06 recognised that the high proportion of transport and logistics costs in the final price of products significantly reduced Colombia's competitiveness in international markets (Ministry of Transport, 2002). Although the time to trade has decreased significantly since 2006, the costs to export and to import have been increasing since 2008. Inland transportation and handling constitute a very large share of exporting and importing costs and are significantly higher than the averages for both South America and the OECD (Figure 2.5) (World Bank Doing Business, 2013).

Figure 2.5. Comparison of costs to trade and costs of inland transportation and handling, 2013



Note: Cost measures the fees levied on a 20-foot container in USD. All the fees associated with completing the procedures to export or import the goods are taken into account. The cost does not include customs tariffs and duties or costs related to sea transport. Only official costs are recorded.

Source: World Bank (2013), Doing Business Trading Across Borders indicators, www.doingbusiness.org/.

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Macroeconomic performance

Colombia was the fourth largest economy in Latin America, as measured by 2013 GDP. Colombia is an **upper middle-income country** (GDP per capita of USD 12 695 at PPP in 2013), but its income per capita remains about 70% below the OECD average and is lower than that in other emerging markets. Low labour productivity, particularly in the informal sector, explains most of this gap, although productivity improved rapidly during the mid-2000s. The mining and services sectors dominate the economy's productive structure.

At the beginning of the 1990s, trade and financial liberalisation measures were implemented. Several laws eased the conditions for foreign capital to enter Colombia, promoted more competition in the financial system, and gave financial institutions more liberty in the management of financial operations and interest rates. A systematic failure of the banking system led Colombia into a **severe economic and financial crisis at the end of the 1990s** characterised by a deep recession and rising unemployment. In 1999, the GDP fell by 4.2% and unemployment reached 13.1% (WDI, 2013). The banking crisis in Colombia was also accompanied by a currency crisis. The same year, its exchange rate regime – a target zone – collapsed and the exchange rate was allowed to float freely.

In 2000, growth returned, with an increase of 4.4% in GDP. **Economic growth** was strong in 2004-07, but fell significantly as a result of the global financial crisis in 2008 and 2009, when GDP growth averaged 2.6% (Figure 2.6). Colombia's combination of countercyclical policies and the strong performance of oil and mineral exports prevented the country from falling into recession and the economy rebounded again, reaching 6.6% growth in 2011 (OECD, 2013a). The significant improvements in matters of security and fiscal management, as well as low, stable inflation, significantly decreased uncertainty regarding its investments, future taxation, and financing costs. Growth volatility is now lower than the average for Latin America. Low, stable inflation – 3.4% in 2011, the lowest rate in the region – implied lower long-term real interest rates, better resource allocation and productivity, and increased safety for investors (Uribe, 2012). Strong economic growth is foreseen for 2014-18, at an average of 4.8% (OECD, 2015).

Figure 2.6. Colombia: Selected macroeconomic indicators, 1990-2013



Note: Unemployment rates covering the 1990s decade are not fully comparable with the most recent data, as household surveys on which these are based covered initially only 13 cities, while they now report information at a national level. The budget balance refers to central government.

Source: IMF (2014), *World Economic Outlook Database*, www.imf.org/external/pubs/ft/weo/2014/01/weodata/index.aspx.

StatLink <http://dx.doi.org/10.1787/888933181297>

Demographic factors have shaped the Colombian **labour force** in the last decades. This has been characterised by fairly stable participation of men and increasing participation of women, an increase in rural-urban migration, and an increase in the average age of the population as a result of a longer life expectancy and a decrease in family size. Another important feature of the Colombian labour force is that the qualified labour force (i.e. workers who completed secondary education), which represented less than 40% of the urban labour force at the beginning of the 1990s, constituted almost 60% of the labour force in mid-2000s (Hudson, 2010). The sharp increase in the **unemployment** rate at the beginning of 2000s, closely linked with the recession, was accompanied by deterioration in the quality of jobs as measured by the size of the informal sector and the extent of under-employment. In 2000-06, the informal economy accounted for about 50% of GDP. Employment in rural areas was highly affected by forced displacement resulting from internal conflict. Despite a gradual decline since 2002, the unemployment rate remains

high (9.8% in 2011, above the OECD average) particularly for the young female and urban populations (Hudson, 2010; WTO, 2012; IMF, 2013; OECD, 2013a).

Despite the rapid improvement in per capita GDP during recent years, **poverty** levels remain high. The poverty incidence reached 32.7% in 2012. Rural poverty remains higher than in urban areas, with 46.8% of the rural population living below the national poverty line in 2012 and more than 60% living in conditions of poverty. Income inequality remains extremely high by international standards. The Gini index shows that **inequality** is one of the highest in Latin America and the Caribbean region (DANE, 2013; OECD, 2013a; WDI, 2014).

The fiscal rules of the 1991 Constitution restricted the government's ability to raise revenues at the same pace as **public sector expenditure**, which increased from 20.4% of GDP in 1990 to 33.7% in 2001 (Hudson, 2010). In reaction to the 2007-08 financial crisis, Colombia used **fiscal policy** to boost medium-term growth and reduce unemployment, which also led to an increase in expenditure and fiscal deficit levels. In 2011, Colombia introduced a fiscal regulation to enhance public sector discipline and reformed the system of oil and mining royalties. Currently, Colombia has the lowest level of inflation in the region (3.4% in 2011).

International trade grew strongly during the review period: both imports and exports increased at an annual average rate of approximately 17% between 2005 and 2011. The increase in exports is directly linked to the boom in the mining and energy sectors. Colombia's **exports** remain relatively **concentrated**, both in terms of products (coffee, oil, coal, and nickel) and destinations (the United States, Venezuela, Ecuador, Mexico and Peru) (UN Comtrade, 2012). Trade in traditional exports has grown more quickly than trade in non-traditional exports during the last decade. The United States has been the primary destination of Colombian exports and also provides 26% of its imports. During the past decade, Colombia has concluded several free trade agreements (FTAs) and is in the process of negotiating several others.

Colombia maintains a **floating exchange rate**. During the recent period, and partly because of substantial capital inflows into Colombia, the Colombian peso appreciated, lowering the cost of imports but making exports less competitive. To address this situation, the Central Bank intervened repeatedly on the exchange markets (WTO, 2012).

Colombia is the third largest destination for **foreign investment** in South America, after Brazil and Chile (OECD, 2012). The change in Colombia's economic model in the early 1990s led to a range of policy measures that fostered foreign direct investment (FDI), simplified procedures governing FDI, and removed impediments to investment in specific sectors. Most FDI has been directed to the mining, petroleum, manufacturing, financial services, transport and telecommunications sectors. The agro-fisheries sector received only 0.4% of inward FDI in 2011.

Colombia's **current account balance** has traditionally been in deficit, due to negative balances in income and services and in spite of the growing importance of remittances. Colombia has consistently been a net importer of services, especially in transport, travel, insurance, finance, and professional services. Nevertheless, the balance of trade in goods has remained in surplus for most of the last two decades. The share of external debt in total public debt is approximately 35%. International reserves have also generally increased, most significantly in 2007, reaching record levels of more than USD 20 billion and representing about eight months of current imports of goods.

Colombia has made continuous efforts to improve its **business environment**. It ranks 43rd of 189 countries in terms of the ease of doing business, and remains third in Latin

America. It can do more, particularly by decreasing the administrative burden on start-ups, ensuring reliable access to electricity, increasing access to credit, simplifying the tax system, and ensuring contract enforcement (OECD, 2013a; World Bank, 2013). Moreover, significant barriers to competition remain in some product markets, including telecommunications, food production, and the financial sector (OECD, 2013a).

Summary

- Reforms undertaken in Colombia over the last two decades helped to establish a stable macroeconomic performance. Colombia has made continuous efforts to improve its business environment, but further efforts are warranted. In order to sustain high rates of economic growth, structural reforms are needed.
- The structure of the economy is dominated by the mining and services sectors. Meanwhile, investment in the agricultural sector remains at low levels and of low relative importance when compared to the other sectors in the economy.
- Infrastructure remains a major bottleneck. In most rural areas there are too few secondary and tertiary roads and their quality is poor. River transport would be a less expensive way to move freight in Colombia (especially bulk goods), and the country has an unexploited resource in the Magdalena River. The deficient stock and quality of infrastructure (both rural and agricultural), as well as the structure of marketing systems, affects farmers' access to markets.
- Agricultural activities – crops and livestock – are the largest users of water resources; they were estimated to consume 60% of available resources in 2008 and are projected to reach 64% in 2019. However, only 2% of the agricultural area benefits from irrigation works, while six times this area is thought to be suitable for irrigation.

Note

1. DANE defines the rural area as dispersed housing arrangements characterised by the existence of farms in-between. It also considers that this does not benefit of the same public services and facilities as the urban areas.

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PART I

Chapter 3

The agricultural situation in Colombia

This chapter examines the key issues that have shaped the evolution of the Colombian agricultural sector and that have conditioned policy responses over the last two decades. Agriculture is an important sector representing 17.5% of total employment and contributing to 5.2% of GDP in 2013. The chapter looks at the land tenure system and farm structures, the changes in input use, as well as the evolution of agro-food trade flows and the links to the environment. Issues relating to farm incomes and the rural socio-economic context are also considered in this chapter. Colombia, like other Latin American countries, is characterised by a highly dualistic distribution of land ownership, the roots of which can be traced back to the colonial era. The sector is dominated by small-scale productive units, with 67.6% of owners covering plots smaller than 5 ha (4.2% of agricultural land) and only 0.4% of owners holding land plots higher than 500 ha (representing nevertheless 46.5% of land). Natural resources and the environment are under strong pressure, partly due to land use conflicts, soil erosion, and inadequate water use.

Evolving role of agriculture over time

The agricultural sector has traditionally played an important role in the economic growth of Colombia (Tovar and Uribe, 2008). Until the beginning of the 1990s, agriculture was the main productive sector of Colombia, and the economy as a whole was closely linked to its performance. By the 1960s, Colombia had entered a period of fast expansion in the commercial agriculture sector and stagnant growth in traditional agriculture, resulting in continuing high levels of rural poverty. Growth in commercial agriculture, especially in the 1960s and 1970s, was partly in response to incentives to mechanise and to intensify the use of modern inputs and partly owing to protection from imports (Berry, 2004). As a result, labour demand grew slowly during the period 1950-87, with commercial agriculture providing only 18% of new rural jobs while the smallholder agriculture sector accounted for nearly 70% of rural employment. The coffee booms of the 1970s and the 1980s coincided with important increases in agricultural and total GDP.

The import substitution policies used in the second half of the previous century, including tariffs, quantitative restrictions, and credit policies, isolated domestic prices from international fluctuations. Thus protected, the agricultural output expanded by about 3% annually during the 1950s and 1960s and by 4.5% annually in the 1970s. Over the long run, however, these policies discouraged technical change and productivity growth, and resulted in less efficient resource allocation, in that they promoted the cultivation of cereals (wheat, maize, barley) over export products with clearer comparative advantages, such as coffee, cocoa, sugar, banana, and tropical fruit. Moreover, the intensification of the internal conflict during the 1990s in rural areas hindered access to factors of production and the growth of agricultural output (Box 3.1). Thus, in the 1980s the sector's growth declined to only slightly more than 2.5% per year (FAO and CAF, 2006).

At the beginning of the 1990s, Colombia entered a decade of trade opening. The Colombian government replaced crop support prices with lower "floor" prices based on international prices, eliminated its monopoly in agricultural marketing, and encouraged private banks to lend to farmers and agricultural exporters. Government purchases of crops were reduced and then eliminated (World Bank, 2003). Greater imports of short-cycle products such as grains encouraged domestic producers to switch to crops such as palm oil, cocoa, plantain, and fruit. To diversify the markets to which Colombian agro-food products were sold, the government began negotiating a large number of trade agreements (including with Mercosur, the United States, Central America's "northern triangle", Chile, Canada, the European Free Trade Association (EFTA), and the European Union).

From 1992 to 1997, the process of structural transformation led to a reduction in agriculture's contribution to GDP. The recession at the end of the 1990s coincided with a slowdown in the sector (Berry, 2004). In recent years, Colombia has been consolidating its shift away from short-cycle (temporary) toward long-cycle (permanent) crops. Unfortunately, in late 2010, just as the security situation began to improve significantly, the country suffered a series of extreme weather phenomena, including extensive floods,

Box 3.1. Internal conflicts in Colombia

Rural conflict has been largely responsible for the agricultural sector's weak development and the displacement of large numbers of the rural population. It has been driven by both a purely agrarian problem and an armed conflict, which have mutually reinforced each other. The agrarian problem arose from disputes related to land tenure (Section 3.3) and the Colombian government's failure to address agrarian reform over several decades.

The internal armed conflict began in the 1940s. A civil war between the Colombian Conservative Party and the Colombian Liberal Party took place during the period 1948-58. Battles were fought primarily in rural areas and provoked peasant violence throughout Colombia. Institutional chaos and the lack of security in rural areas during this period caused millions of people to abandon their homes, land, and other assets. In 1958, Liberal and Conservative party elites, together with religious and business leaders, negotiated a political system known as the National Front. The two parties agreed to hold elections, but to alternate power regardless of the election results. This pact lasted until 1990. This period of stability allowed Colombian Conservative and Liberal elites to consolidate their power, while also strengthening the military and inhibiting political reforms.

In the 1960s, several left-wing guerrilla groups formed in response to this monopoly on power, promising to overthrow the government, introduce land access for smallholders, and eliminate social injustices and repression inflicted on the rural population. These groups included the National Liberation Army (ELN, formed in 1962), Revolutionary Armed Forces of Colombia (FARC, 1965), and People's Liberation Army (EPL, 1967). Over time, FARC emerged as the most powerful of these groups, acquiring de facto control over large areas of land in rural areas.

Between 1974 and 1978, the economy slowed and inflation increased rapidly. The country's social unrest created the conditions for illegal activities such as coca cultivation (Box 3.3). The government promoted a national security policy to counteract illegal armed groups, and in the late 1970s, self-defence armed groups created by drug-dealers and local landlords in response to left-wing groupings kidnappings, cattle theft, and extortions began to appear in different parts of the country. In the 1980s, peace negotiations between the government and guerrillas failed, and FARC continued its territorial expansion, and self-defence groups mutated into right-wing paramilitary groups. The government eventually strengthened the presence of the army in the regions affected by the armed conflict while also promoting investment in infrastructure works in these areas to break their geographic isolation and marginalisation.

Drug traffickers and the guerrilla movements sometimes accommodated and sometimes clashed with each other. Accommodation occurred when drug traffickers seized land in areas dominated by guerrilla groups and paid the guerrillas a tax in exchange for protection. Conflict occurred when drug traffickers who owned large properties refused to co-operate with guerrillas and used their own paramilitary armies to fight the guerrillas. When several powerful drug traffickers had accumulated large areas of land to establish coca crops and build laboratories to process cocaine, their private armies allied with self-defence groups and the Colombian military against the leftist guerrillas. These conflicts triggered brutal repressions of the civilian population through massacres and assassinations. In addition, drug cartels and other illegal organisations carried out terrorist attacks against state institutions and public figures who opposed criminal activities.

Box 3.1. Internal conflicts in Colombia (cont.)

The 1991 Constitution aimed to create a roadmap for the creation of a society based on peaceful coexistence. The government concluded a peace agreement with the EPL and some other guerrilla groups in 1990-91. Following the death of Pablo Escobar, one of the most powerful leaders of the drug cartel, in 1993, drug-trafficking cartels weakened. However, paramilitary groups remained powerful and in 1997 they founded the United Self-Defence Forces of Colombia (AUC). Paramilitary groups effectively controlled the north and northwest of the country. Due to a crisis of legitimacy, the government was unable to take concrete actions to end the conflict.

The conflict eased in 2002 with the State focused both on a military defeat of the FARC and the launch of a peace process with paramilitary groups. By 2005, the successful offensive against guerrillas combined with the demobilisation of the paramilitaries through negotiations led to the establishment of a legal framework known as Peace and Justice Law which demobilised illegal armed groups and recognised victims' rights. However, successor groups to paramilitaries began to operate, particularly in zones that were under the former paramilitaries' territorial control. It is believed that even though these criminal groups lack the structural organisation of the AUC, they benefitted from the space left by the paramilitary demobilisation and are dedicated to drug-trafficking activities, from controlling coca crops to processing and shipping cocaine abroad.

The 2010-14 government changed direction, focusing on reparation to victims and finding a political solution to the conflict. The Victims and Land Restitution Law was adopted and enforced in 2011 (Law 1448 of 2011) and a peace process was initiated with FARC in 2012 (Section 4.1). The government has also been implementing the Policy for Prevention and Comprehensive Attention to Forced Displaced Population. Coca crop surfaces have significantly decreased and are now concentrated in fewer parts of the country or have shifted to neighbouring countries, such as Bolivia or Peru.

Source: Reyes (2009); UNDP (2011); CMH (2013); HRW (2013).

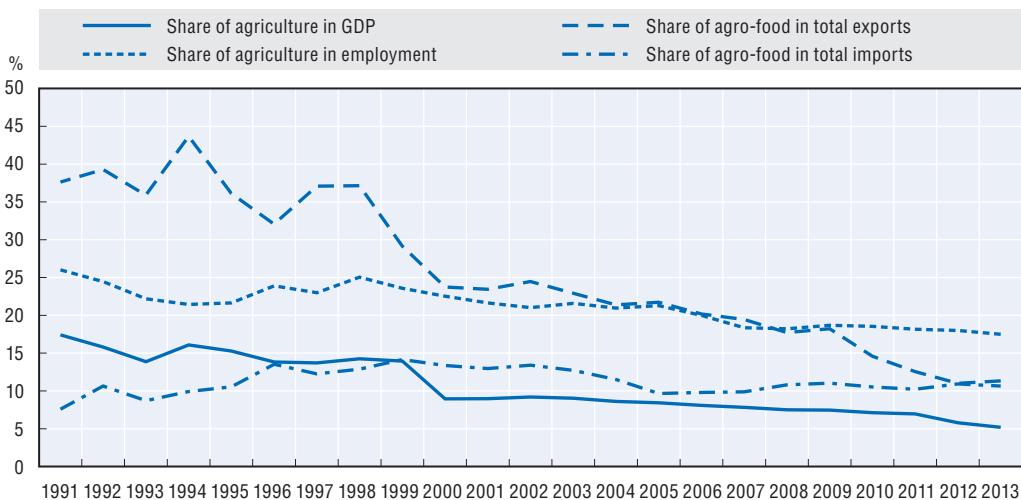
which affected agricultural production and threatened to undermine recent economic and social improvements (ECLAC, 2012).

The year 2013 was marked by peace negotiations between the Government and the Revolutionary Armed Forces of Colombia (FARC), and by a wave of country-wide farmer protests. The peace negotiations resulted in a preliminary agreement concerning a common vision for rural development. Several measures (such as subsidies or import measures) were under immediate consideration as a response to the latter, in order to placate the protesters. The recent context led to the establishment of the Agrarian Pact (*Pacto Agrario*) that outlines new rural development approaches to improving agricultural livelihoods. It sets out a longer-term vision for the sector which focuses, among other issues, on: use of land and water resources, increased productivity and competitiveness, improved infrastructure and other public goods for the agricultural sector, and redefined institutional architecture needed for policy design and implementation (Chapter 4).

Agriculture and the food sector in the economy

Agriculture's contribution to Colombia's GDP declined from 16.5% in 1990 to 5.2% in 2013. Its share of national employment has also decreased, from 55% of total employment in 1958 to 26% in 1990 and then to 17.5% in 2013 (Figure 3.1) (DANE, 2013; WDI, 2013).

Figure 3.1. The share of agriculture in GDP, employment, total exports and imports, 1991-2013



Note: Agriculture data include forestry, hunting and fisheries. Agro-food trade data include fish and fish products.

Source: DANE (2014a); UN (2014), UN Comtrade Database, <http://comtrade.un.org>.

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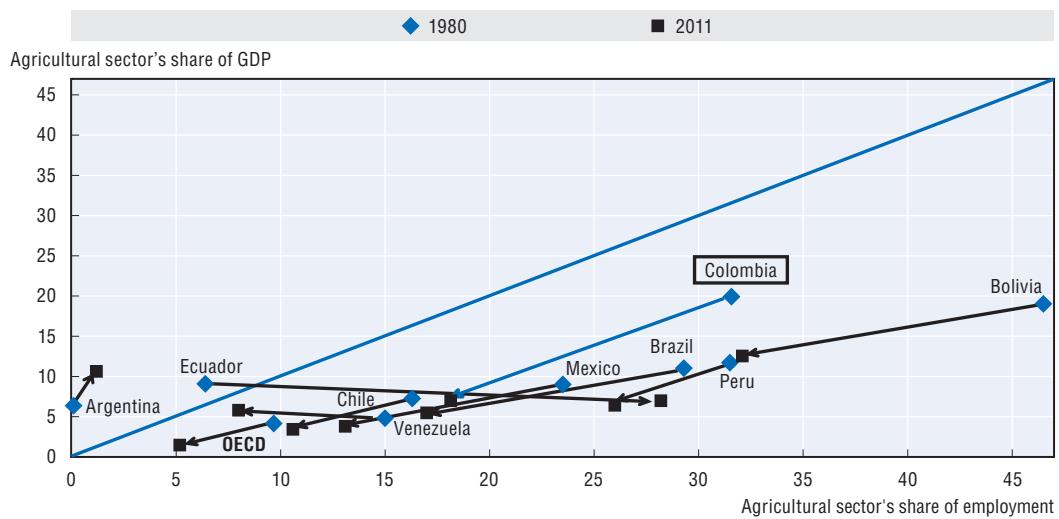
Agro-food constituted between 30% and 40% of the total value of Colombia's exports during the 1990s, but had fallen to 13% in 2012. Agro-food imports as a proportion of the total value of imports has fluctuated, rising from 8% in 1991 to 13% in 2002, then falling to 10% in 2005. In 2012, they accounted for 10.2% of all imports by value.

Employment in agriculture and agriculture's contribution to GDP decreased during the period 1980-2011, as is common during **structural transformation**. Other countries in Latin America and the Caribbean region have seen the same declines, although the pace of Colombia's transformation has been slower than those of Brazil, Chile and Mexico, and slower than the average pace seen in OECD countries (Figure 3.2). Agricultural productivity, however, has been increasing slowly. In the most recent period, those exiting the agricultural labour force have been absorbed by service sectors with low or stagnant productivity, such as the wholesale and retail trade. During 1950-87 period, agriculture made a significant contribution to overall labour productivity growth; however, this began to decrease in 1988 and became negative as of 1997 (Timmer and de Vries, 2008; Kucera and Roncolato, 2012).

The share of agriculture in regional GDP has declined in each of Colombia's five regions over the last two decades. The largest decrease has been experienced in the Orinoco-Amazon region (Figure 3.3). The productive structures across the regional economies are different. The mining and quarrying sector is very important for the Orinoco-Amazon region and has become increasingly significant for the Oriental and Atlantic regions over the last decade. In the Central and Pacific regions, services and manufacturing are the sectors that currently contribute the most to GDP (DANE, 2014a).

Colombia's Ministry for Agriculture and Rural Development (MADR) has also developed an Indicator of Agricultural Activity Concentration as a measurement of the importance of the agricultural sector in departments and municipalities, which shows that the Oriental region has the highest concentration of agricultural activity, followed by the Pacific, Central, Atlantic, and Orinoco-Amazon regions (Figure 3.4). This is consistent with agriculture's contribution to GDP in each region (MADR, 2013).

Figure 3.2. Evolution of agriculture's share of GDP and share of employment in selected countries, 1980-2011

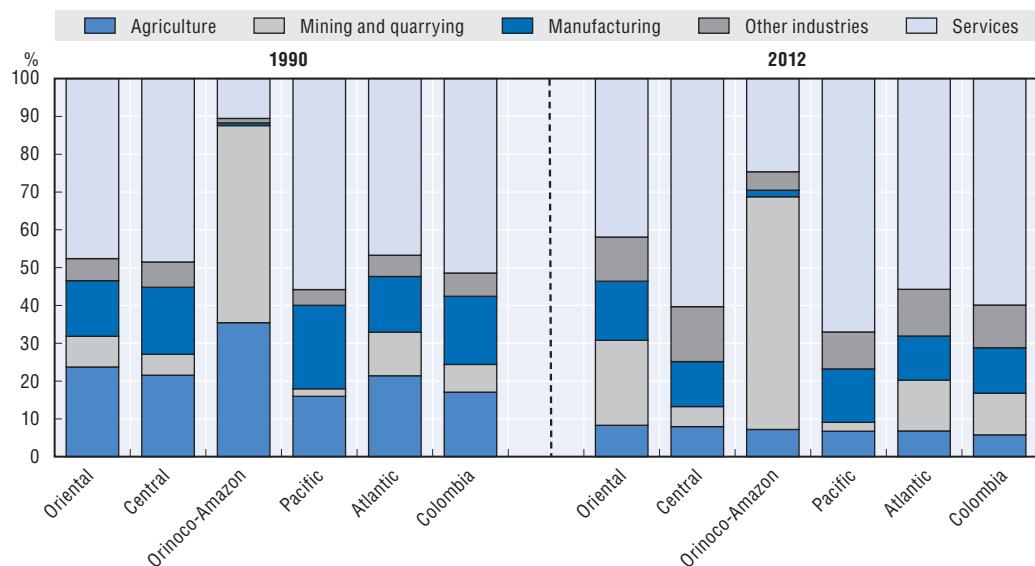


Note: 2011 or latest available year.

Source: MADR (2014); World Bank (2014), World Development Indicators; Peru National Institute of Statistics and Informatics (2014).

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Figure 3.3. Regional structure of the economy, 1990-2012

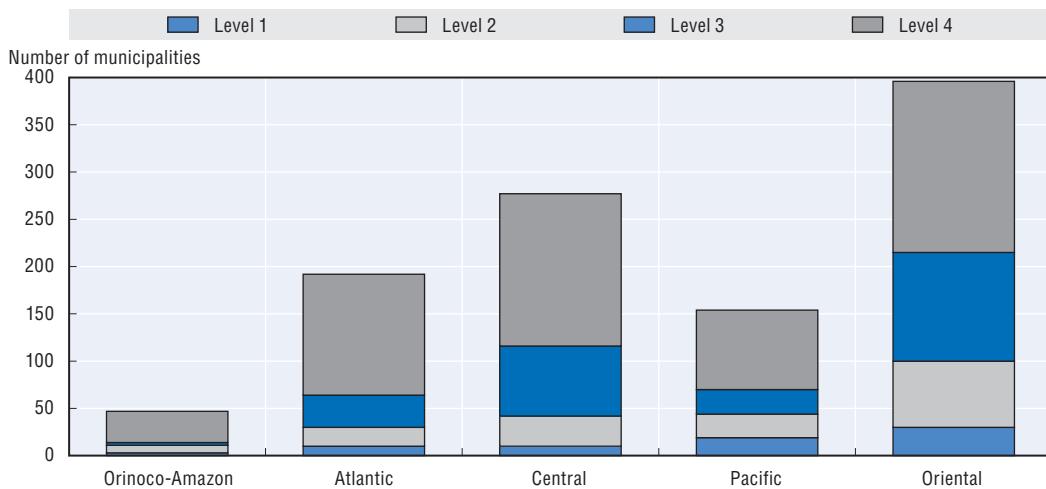


Note: The percentage value represents the share of value added contributed by each sector in total regional GDP. The national accounts methodology for the calculation of GDP was adjusted by DANE in 2002. The 1990-2001 and 2002-12 GDP series at regional level are not fully comparable.

Source: Authors' calculations based on DANE (2014a).

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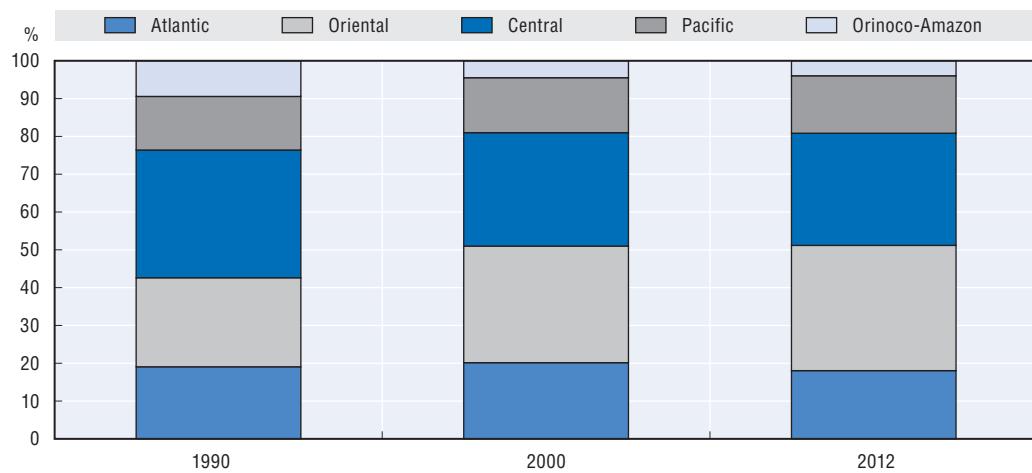
The Oriental and Central regions provide the largest proportions of agricultural value added as a result of both producing a larger variety of crops and producing the main export and higher value added crops (Figure 3.5). Livestock is also very important in these two regions (DANE, 2014a).

Figure 3.4. MADR Indicator of Agricultural Activity Concentration

Note: The figure indicates the number of municipalities by level of priority for selected regions (level 1 is the highest level of priority and is associated to a high degree of concentration of agricultural activities at municipality level). MADR Indicator of Agricultural Activity Concentration at the level of municipalities is determined by: the share in agricultural production, the number of production units, and land productivity.

Source: Authors' calculations based on information provided by MADR (2013).

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Figure 3.5. Regional distribution of agricultural value added, 1990-2012

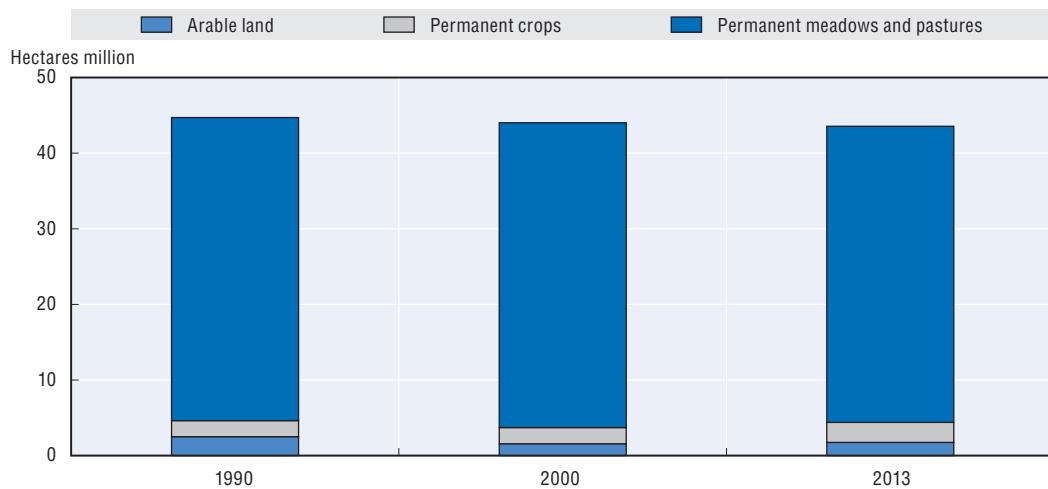
Source: Authors' calculations based on DANE (2014a).

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Agricultural land

Agricultural land covers an area of 43.6 million ha, representing approximately 39.5% of the total land area. This is lower than in Argentina (53.9%) or Mexico (53.0%), but higher than in Brazil (32.5%), Chile (21.2%) or Peru (16.8%). Agricultural land consists of 1.8 million ha of arable land, 2.7 million ha of permanent crops and 39.2 million ha of pastures and meadows (Figure 3.6). Seventy-eight per cent of the pastures and meadows are cultivated, while only 22% are naturally grown. In half of Colombia's departments, more than 50% of the agricultural land is devoted to livestock. The area dedicated to permanent crops has been increasing since 2007 (MADR, 2014).

Figure 3.6. Agricultural land, 1990-2013



Source: MADR (2014).

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The composition of agricultural land is similar to other countries in South America (Table 3.1). The very large share of pastures and meadows is directly correlated to the importance of livestock in the agricultural sector (46.2% of agricultural GDP in 2013) and to the high concentration of land ownership (Section 3.4). Inconsistencies between current usage of these lands and the actual suitability of the soil generate **land use conflicts**. Land use conflicts mainly reflect the lack of national and regional land use planning and ineffective management at the level of municipalities; but they are also related to the inadequate design and execution of incentives for developing crop, livestock and forestry activities; a precarious property tax system; the use of land for speculative purposes rather than as a factor of production; inflexibility in the structure of land tenure; as well as weak monitoring of environmental and natural resources (IGAC and Corpocaja, 2002; UNDP, 2011).

Table 3.1. Land use patterns, 2012¹ (million ha)

	Land area	Agricultural area	Permanent pastures	Arable and permanent crops	Arable land	Permanent crops
Argentina	273.7	147.5	108.5	39.0	38.0	1.0
Brazil	845.9	275.0	196.0	79.0	71.9	7.1
Chile	74.4	15.8	14.0	1.8	1.3	0.5
Colombia	111.0	43.6	39.8	3.9	1.4	2.4
Ecuador	24.8	7.3	4.8	2.5	1.2	1.4
Mexico	194.4	103.2	75.0	28.2	25.5	2.7
Paraguay	39.7	21.0	17.0	4.0	3.9	0.1
Peru	128.0	21.5	17.0	4.5	3.7	0.9

1. 2012 or latest available year.

Source: MADR (2014); FAOSTAT (2014); World Bank (2014), World Development Indicators.

There is over-exploitation of land currently used for pasture: while only 13% of the total agricultural area appears to be suitable, more than double this amount is actually used. Nearly one-quarter of land used for grazing is prime agricultural land that could be better used for growing crops, while land that ideally would be conserved or left as forest is cultivated or used

for grazing, resulting in erosion and destruction of forest and water resources. On the other side, crop land is greatly under-exploited. Of the nearly 21.5 million ha suitable for crop cultivation, only 4.5 million ha are currently used for such activities (Table 3.2) (Gruszczynski and Jaramillo, 2002; Deininger, 1999, 2004; USAID, 2010; IGAC et al., 2012).

Table 3.2. Suitability of use versus actual use of agricultural soil, 2002 and 2012

Soil use	2002		2012			
	Vocation of use		Current use		Vocation of use	Current use
	ha (mil.)	%	ha	%	ha (mil.)	%
Temporary and permanent crops	21.6	18.9	4.2	3.7	22.1	19.3
Pastures and meadows	14.3	12.5	42.2	37.3	15.2	13.3
Agroforestry	6.8	6.0	-	-	4.1	3.6
Forests	66.8	58.6	57.8	50.7	64.2	56.2
Soil conservation	4.6	4.0	3.1	2.7	6.3	5.5
Others	-	-	6.4	5.6	2.3	2.1
Total	114.2	100	114.2	100	114.2	100

Source: IGAC and CORPOICA (2002), “Uso Adequado y Conflictos de Uso de las Tierras en Colombia”; IGAC et al. (2012), “Conflictos de Uso del Territorio Colombiano”.

The expanding mining industry also encroaches on agricultural land. The mining industry occupies 5.8 million ha and its continuous expansion is causing conflicts by pushing into areas suitable for agriculture, creating unfavourable environmental impacts, and disturbing particular population groups (Afro-Colombian and indigenous communities) (MADR, 2010; UNDP, 2011; IGAC et al., 2012).

Agricultural land tenure system

Land in Colombia is classified as state property owned by the nation, private property owned by individuals, and communal land. Communal land includes territories of indigenous groups that cannot be transferred or mortgaged; territories of Afro-Colombians; rural co-operatives; and urban community property. Of registered rural land, 22% is state owned, 52% is privately owned, 3% belongs to Afro-Colombian communities, and 23% belongs to indigenous communities. The government is increasingly recognising and legalising indigenous land rights and reserves. As of 2005, Colombia had legalised 647 indigenous reserves, covering 31 million hectares (UN-Habitat, 2005; USAID, 2010).

Customary land tenure in Colombia differs between lowland and upland areas. In lowland areas, indigenous tenure regimes cover extensive adjacent territories and a broad array of habitats. Collective territorial units enclose smaller units, which correspond to specific access, use, and property rights. In upland areas, the tenure regime is a hybrid of Spanish and indigenous tradition. Indigenous lands in these areas tend to be fragmented. Community members may hold private land individually, while possessing access rights to communal land (Griffiths, 2004; USAID, 2010).

Formal documentation, such as a deed, ruling, or a resolution of assignment, is necessary to register land. This creates a hurdle to registration for smallholders or internally displaced populations who may have only oral evidence of their land rights. Registration varies by geographic area. In some areas, a large share of smallholders remain unregistered, while in others, the majority of smallholders hold titles (which may or may not be registered) due

to government registration programmes. Large estate holdings are usually registered (Gruszczynski and Jaramillo, 2002; UN-Habitat, 2005).

The long history of conflict and population displacement led to the creation of informal settlements that are located on both public and privately owned land. As land values increase, formal title holders are more likely to seek the eviction of squatters in order to sell land for lucrative development projects. The uncertainty of tenure in some squatter settlements impedes investment from both current residents and government institutions (Everett, 2001; USAID, 2010).

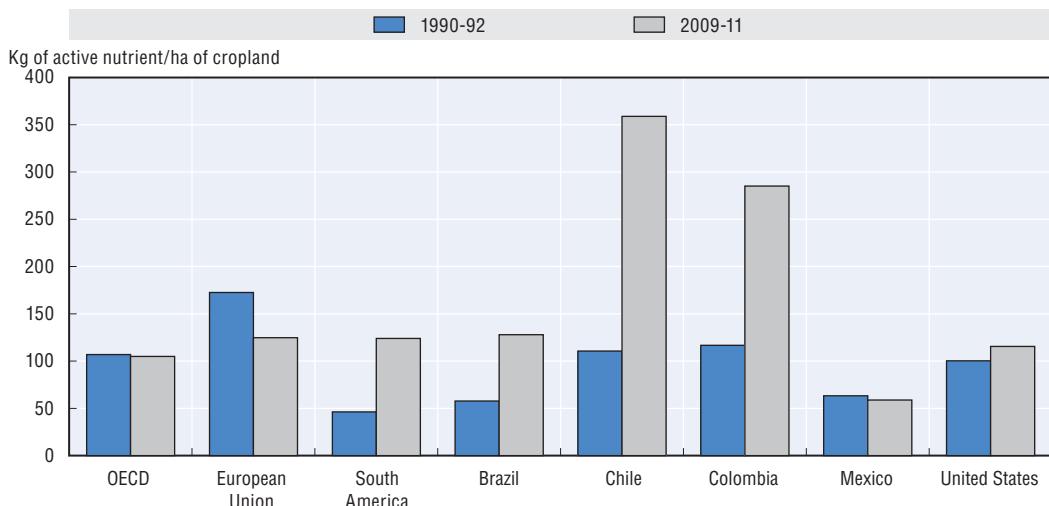
Colombia, like other Latin American countries, is characterised by a highly **dualistic** distribution of **land ownership**. Land distribution during the first few centuries of the colonial period enabled certain groups to acquire the best land, creating landowning elites able to press for policies favourable to them. Land redistribution efforts undertaken in the 20th century failed largely due to opposition from large landowners (Annex 3.A1). Public policies created incentives to purchase land that, to a large extent, have benefited large landowners. Tax benefits for landowners, rural public investments aimed at large landowners, and obstacles to the leasing and sale of smaller properties are some examples. This led to inefficient assignments of frontier land.

Armed conflict and drug trafficking activities made land administration in Colombia difficult. Land markets in Colombia have been weak and highly segmented, have imposed high transaction costs, and on occasions have comprised primarily informal transactions. These obstacles to well-functioning market transactions hinder both land transfers to more efficient producers and improved equity in land distribution. The land tax system has not been progressive, encouraging the accumulation of land for unproductive purposes. Land use conflicts (Section 3) between pastures and crop land led to an allocation of agricultural land contrary to its suitability across various departments and to the development of extensive low-productivity cattle farming.

Today, there are two production and commercialisation systems: commercial agriculture characterised by large modern farms selling their products in organised markets and peasant agriculture characterised by small labour-intensive farms located far from markets (CEDE, 2004; Deininger et al., 2004; Ibañez and Munoz, 2010; USAID, 2010). The government's most recent reform effort, which seeks to restore property to landowners who were forced off of their land or whose lands were illegally occupied, was the first to legally recognise the existence of an armed conflict in Colombia. The 2011 Victims and Land Restitution Law (*Ley de Víctimas y de Restitución de Tierra*, Law 1448) calls for 2 million ha of land to be returned to its proper owners; however, this is far short of the 4 million to 6.8 million ha thought to have been abandoned or illegally occupied.

Changes in input use and capital investment

Fertiliser applications rates are high and have been increasing since the beginning of the 1990s (FAOSTAT, 2014). Average fertiliser application rates were of 360 kg of nutrients per ha of crop land in 2011. These rates currently represent more than double the average fertiliser use across South America and in the OECD (Figure 3.7). Usage varies due to differences in the soil quality and composition, susceptibility of crops to pests and diseases, and levels of knowledge regarding appropriate use (SAC, 2009; AGRONET, 2013). There is very little diversification of the fertilisers used, and low rates of organic manures and bio-fertilisers use (CONPES, 2009).

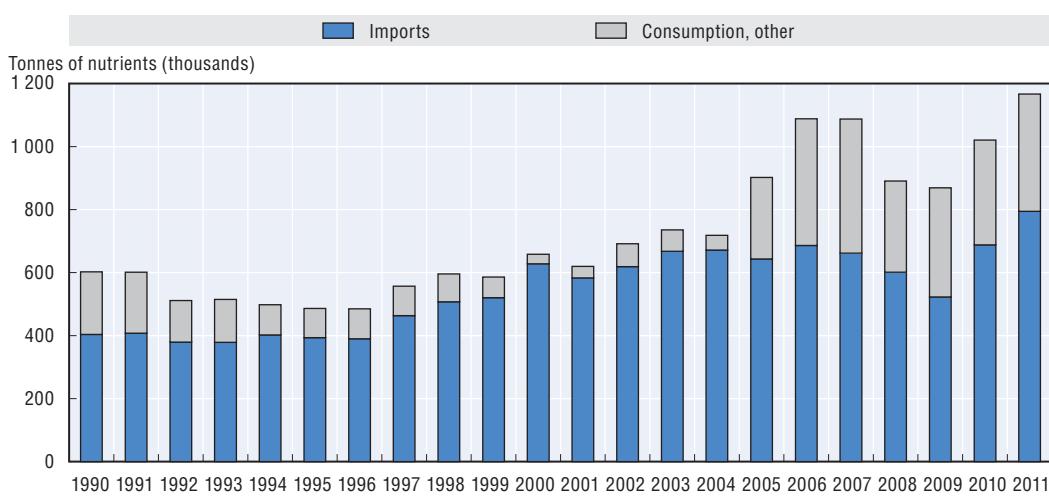
Figure 3.7. Use of fertiliser in selected countries, 1990-2011

Note: Use of fertiliser includes nitrogenous, phosphate and potash fertilisers in nutrient terms. Crop land includes arable land and permanent crops.

Source: FAOSTAT (2014).

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Colombian production of the raw materials needed to manufacture fertilisers fails to meet the high domestic demand. For this reason, Colombia imports close to 70% of its total fertiliser consumption (Figure 3.8). Urea, diammonium phosphate (DAP), monoammonium phosphate (MAP), and potassium chloride (KCL) account for three-quarters of fertiliser imports (KCL) (WITS TRAINS, 2014; FAOSTAT, 2014). Prices for these particular compounds have increased systematically in recent years.

Figure 3.8. Total consumption and imports of fertilisers

Source: FAOSTAT (2014).

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While an increase in international prices for fertilisers is rapidly transmitted to national markets, prices fall much more slowly when international prices decrease (Figure 3.9). The exchange rate is also an important factor influencing the domestic price of

Figure 3.9. The evolution of national prices versus international prices for urea, 2005-12



Source: SAC (2009); SIPSA (2013).

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fertiliser, as are the costs of transport, storage, and further processing. The wholesale prices for the three main compounds can be 25% to 35% higher than the international price, and in some regions retail prices can be more than 80% higher than the international price (AGRONET, 2014). The high rates of fertiliser use combined with increasing domestic prices are reflected in the total production cost of specific products (Table 3.3). High domestic prices particularly affect small farmers.

Table 3.3. Share of fertiliser and pesticide cost in the total cost of production, by selected products

Product	Fertiliser (%)	Pesticide (%)
Maize	33	8
Cocoa	31	4
Coffee	30	2
Potato	29	12
Cassava	28	n.a.
Palm oil	28	4
Vegetables	27	5.5
Rice	26	13
Cotton	24	9
Sugar	23	4
Fruit	21	9.5
Banana	19	6
Plantain (for export)	12-16	6
Panela cane	19	2

n.a.: Not available.

Source: CONPES (2009); SAC (2009); AGRONET (2014).

The rates of machinery adoption in Colombia are much lower than in other countries in the region, such as Argentina, Brazil, Chile or Mexico. **Mechanisation** trends have stagnated in the last 20 years. The numbers of tractors and threshers, the most widely used

machinery, have been decreasing (Table 3.4) (FAOSTAT, 2014). In addition, much of the machinery is obsolete, owing to low investment in new machinery as a result of the on-going conflict, lack of access to credit, and abundant labour (Diaz Avila et al., 2010). There has even been a decrease in investments by agro-food producers and businesses that can afford machinery according to the Colombian Farmer Society (SAC).

Table 3.4. Agricultural machinery in Colombia, 1991-2003

	1991	1995	2000	2003
Tractors per 1 000 workers	9.4	7.7	6.5	5.9
Harvesters-threshers per 1 000 workers	0.8	1.0	0.9	0.8
Tractors per 1 000 ha of crop land	6.5	5.2	4.6	5.6
Harvesters-threshers per 1 000 ha of cropland	0.6	0.7	0.6	0.8

Source: FAOSTAT (2014).

Agricultural production

Colombia's agricultural products are as varied as its climate and topography. While some crops are cultivated in several regions across the country, others are concentrated within specific regions or sub-regions (Box 3.2).

Box 3.2. Agricultural activities across Colombia's natural regions

The natural differences between the regions and departments also impact the availability and uses of land for agricultural activities. The diverse climate and topography permit the cultivation of a wide variety of crops and forest products. Cultivation is also influenced by thermal floors. Crops such as cocoa, sugar cane, coconuts, bananas, plantains, rice, cotton, tobacco, cassava, as well as most of the country's beef cattle, are produced in the hot regions that range from sea level up to 1 000 m of altitude. The temperate regions – between 1 000 and 2 000 m – are very well suited for crops such as coffee, certain flowers, corn, maize, and other vegetables (such as tomatoes), and fruit (such as citrus, pears, pineapples), as well as dairy cattle. The cooler elevations – between 2 000 and 3 000 m – are most suitable for wheat, barley, potatoes, cold-climate vegetables, flowers, and dairy cattle.

The extremely varied types of soils also reflect the climatic, topographic, and geologic conditions of the Colombian landscape. Those soils best suited to mechanised agriculture are the alluvia in the principal river valleys. The former lakebeds of some of the inter-Andean basins, notably the Sabana de Bogotá, the Ubaté and Chiquinquirá valleys, also fall into this category. Elsewhere, volcanic soils are found in the coffee-growing districts of the Central Andean mountain range. Soils east of the Andes are typically highly leached, with a low pH, ultisols and oxisols.

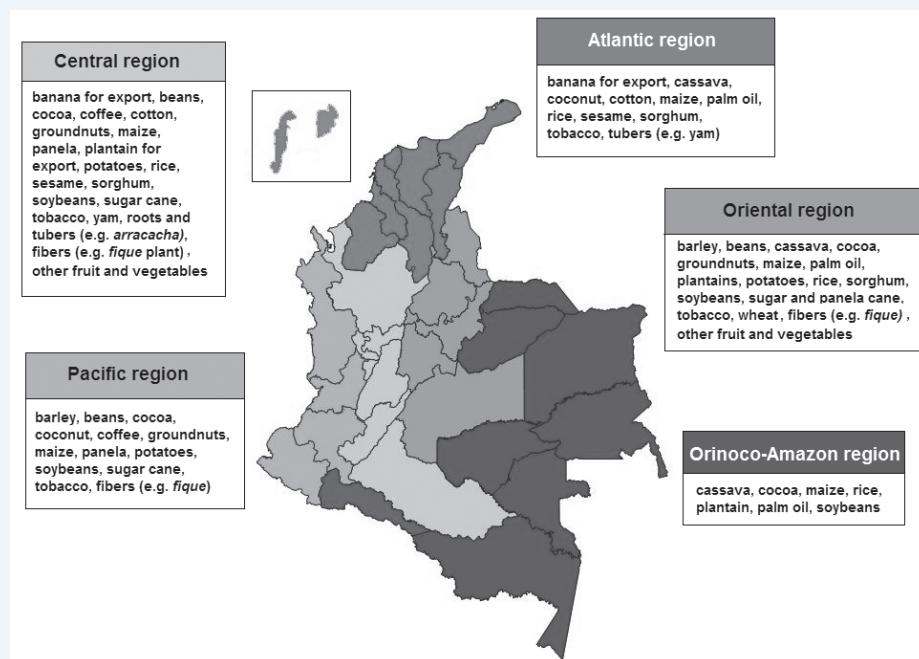
Each of the identified natural regions is characterised by **different agricultural systems**:

- In the **Central (Andean) region**, there is a **mixed intensive mountain system**, containing **two distinct sub-systems** by altitude: i) the inter-valleys and lower altitudes valleys, with **modern commercial farms** cultivating coffee, fruit and vegetables, and ii) higher highlands and valleys, characterised by **temperate climate crops**.
- In the **Caribbean (Atlantic) region**, agricultural activities are relatively technically advanced in some departments and constitute the backbone of the regional economy. There is a mixed system and a coastal plantation system, which includes tropical crops for export by commercial farms along with a subsystem of labour-intensive traditional agriculture.

Box 3.2. Agricultural activities across Colombia's natural regions (cont.)

- In the **Pacific region**, the agricultural system is similar to that in the Caribbean, but the soil is less fertile. There is a subsistence system of tropical crop plantations and livestock, along with some commercial forestry.
- The **Orinoco region** is characterised by a mixed extensive system, set on humid tropical savannah soils and less fertile acid soils. Traditionally, livestock has been extensively exploited within large farms, but during the last decades crops such as rice have been developed and the importance of medium-size farms has increased. Still, the departments in the Eastern plains dedicate most of their agricultural land to cattle-raising. Despite various problems that soils in this region present, this seems to be the region with the **largest potential to expand crop plantations**, possibly within 10-15 million ha of land.
- The **Amazon region** is characterised by a **commercial forestry** system, including small agricultural activities for local consumption along with pastures for extensive low-production cattle-raising activities. Only a few crops are cultivated, including cassava, cocoa, maize, rice, plantain, palm oil, and soybeans.

Figure 3.10. Main crops cultivated across selected regions



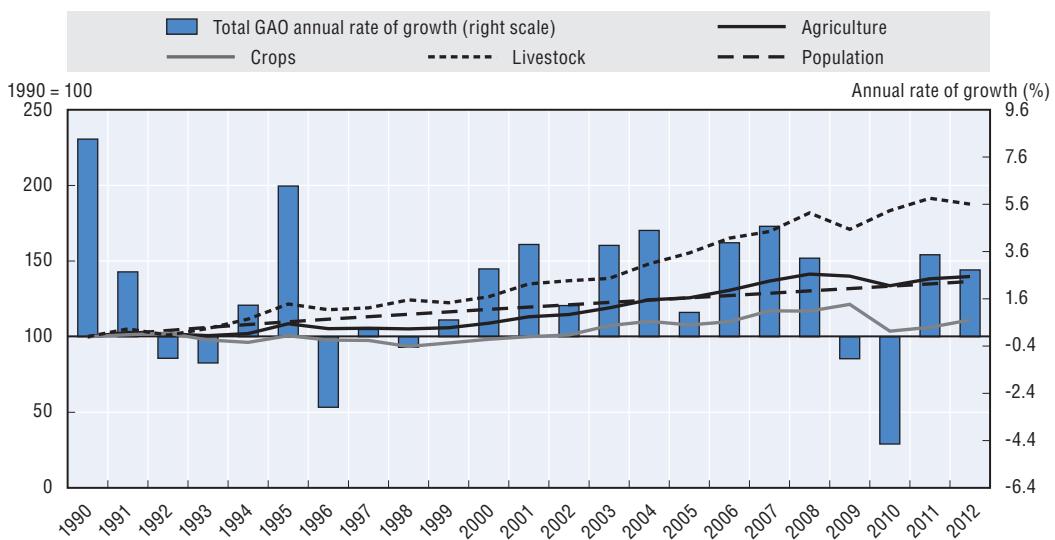
Note: There is no single official grouping of regions. Departments are grouped here based on discussions with MADR and DANE information used for various national surveys and analyses. To simplify the groupings, the department of San Andrés and Providencia is included within the Atlantic region and the department of Valle del Cauca within the Pacific region. Caquetá is included in the Central region and Meta in the Oriental region, as they have been already grouped in this way for data collection purposes within the Extensive Household Survey (*Gran Encuesta Integrada de Hogares*).

Source: Map shape received from MADR and edited by authors.

Source: FAO (2006); FAO and CAF (2006); MADR (2014).

Between 1990 and 2012, gross agricultural output (GAO) increased by 40%, with livestock production rising by 88% and crop production rising only by 11%. In comparison, the population grew by 36.5% (Figure 3.11) (MADR, 2014; DANE, 2014a; WDI, 2014). Annual growth

Figure 3.11. Growth in agricultural output, 1990-2012



Source: MADR (2014); DANE (2014a); World Bank (2014), World Development Indicators.

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in the volume of agricultural production has averaged 1.9% since 1989, albeit with significant fluctuations. For example, the *La Niña* weather phenomenon intensified the rainy season in 2010-11 in Colombia (*ola invernal*), which significantly disrupted the agricultural sector, especially in the Atlantic, Central and Pacific regions. Severe flooding affected more than 3 million people, and both crop and livestock production decreased. The most affected permanent crops were sugar cane, cocoa, coffee, plantain, and banana (representing 72% of the affected area of permanent crops), while flowers were mostly affected by the increased humidity. Weather phenomena like the *ola invernal* are likely to occur more frequently in the future (ECLAC, 2012).

The armed conflict, including population displacement, and the cultivation of illicit crops have negatively affected agricultural production by between 3% and 6% of agricultural GDP by depriving the sector of its two primary factors of production: land and labour (Box 3.3). Moreover, the destruction of farmers' capital has imposed additional costs on agricultural activities, making production more costly and inefficient (Ibáñez, 2008; Pinilla, 2013). The conflict also caused less than optimal use of land and poor investment decisions by producers. In areas where non-state armed actors have been present for long periods, households cut back on investments and reduced the amount of land allocated to perennial crops in order to increase their production of seasonal crops and pasture which were considered to be less risky. Such production decisions tend to persist even after the conflict eases or ends (Arias et al., 2013).

The relative importance of the livestock subsector has increased, rising from 35% in 1991 to reach 46% in terms of value in 2012 (Table 3.5). This reflects both a rise in livestock production and a fall in the production of most crops. Although coffee remains the most important crop in terms of value added contribution, its share has declined, and a number of other crops have increased in importance, including rice, palm oil, beans or avocados (MADR, 2014; FAOSTAT, 2014).

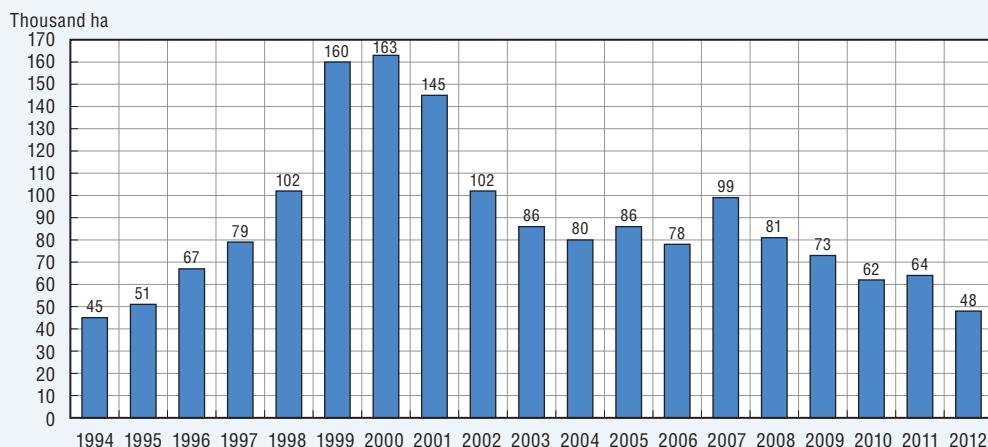
In terms of overall harvested crop area, coffee also accounts for the largest share followed by maize, rice, sugar cane and plantain (Figure 3.14). The area allocated to fruit

Box 3.3. The development of illicit crops in Colombia

The establishment of the first coca plantations occurred in the late 1970s on the Atlantic coast and subsequently in the department of Meta. The scale of plantations expanded in the 1980s and 1990s, first as a response to reinforced coca cultivation controls in Peru and Bolivia. During the period 1982-96, illegal armed groups emerged at the same time as did drug trafficking and drug cartels. Armed coercion was used to control the production and commercialisation of coca crops, which flourished in part owing to the availability of cheap land and labour in certain areas, climatic conditions favouring coca cultivation, and access to maritime and aerial routes to some Caribbean islands and the United States, the main narcotics markets. The weakness of the state and lack of institutions to fight organised crime and promote development through legal activities over several years, in addition to the agrarian problem, encouraged coca cultivation across the country (UNDP, 2011). It is estimated that from the early 1980s to 2000, armed groups acquired approximately 4.5 million ha of land (Elhawary, 2007).

Colombia remains one of the major producers and exporters of cocaine in the world, together with Bolivia and Peru. The area under coca cultivation in Colombia in 2010-11 was estimated to be 64 000 ha across 23 departments. In 14 departments, there has been a significant reduction of the area cultivated with coca (Figure 3.12). Moreover, since 2007, cocaine production has declined. There is a direct correlation between the level of poverty and the intensity of coca cultivation. It was estimated that in 2012 more than 60 000 households received income from the cultivation and extraction processes; each member of the household could potentially receive around USD 1 220 per year from these activities. It appears that 90% of coca-harvested areas are smallholder plantations, with an average harvested area of 1.4 ha.

Figure 3.12. Coca cultivation surface, 1994-2012



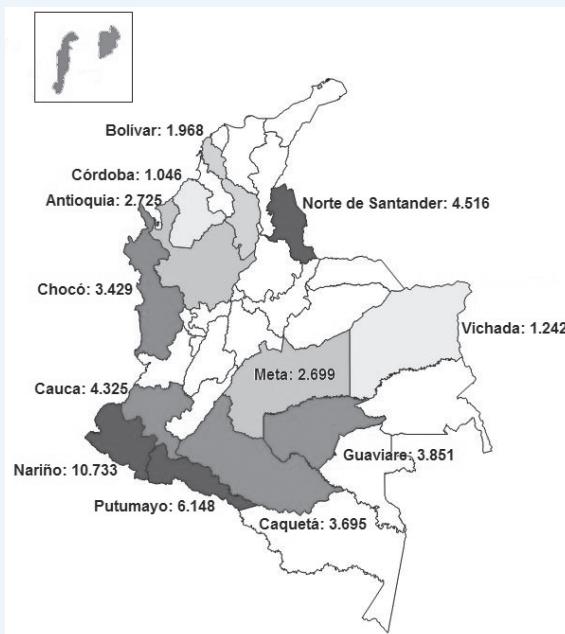
Source: UNODC (2013).

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Around half of all the coca cultivation in the country is concentrated in three departments (Norte de Santander, Putumayo and Nariño) and 80% in eight departments (Figure 3.13). The most important reduction of coca cultivation between 2011 and 2012 occurred in Putumayo and Nariño as a result of aerial spraying and manual eradication. Policy efforts to counteract illicit crops include the Presidential Programme Against Illicit Crops (PCI).

Box 3.3. The development of illicit crops in Colombia (cont.)

Figure 3.13. Coca cultivation surface (hectares) map, 2012



Source: UNODC (2013).

The dynamic of drug trafficking in different territories has amplified the pressure on farmers, indigenous and Afro-descendant communities, as they were often voluntarily or involuntarily involved in such illegal activities. However, through the progressive retrieval of significant areas used for coca cultivations, many of the affected agricultural producers have been able to rebuild their productive units in recent years.

Source: UNDP (2011); UNODC (2005, 2013); UACT (2013).

and palm oil has expanded significantly over the last two decades. Between 1990 and 2012, the palm oil area grew by 221% and its share in total crop area increased from 1.9% to 7.4%. The shares of other crops such as maize, beans, cocoa and potatoes have been declining, while the importance of vegetables and cassava areas has remained relatively stable. Fifteen per cent of the area cultivated with sugar cane (34 000 ha) is destined to the production of biofuels (MADR, 2013).

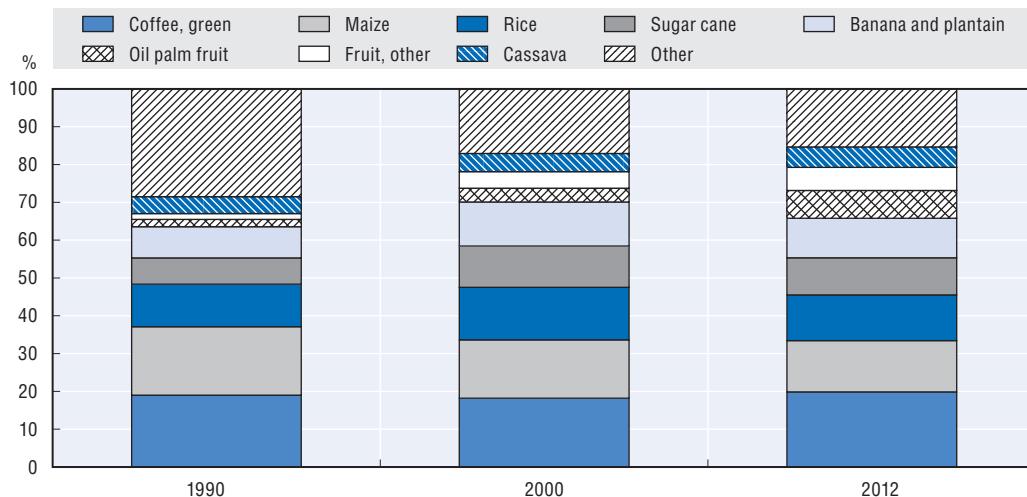
Cereals and oil crops experienced the most severe reductions in overall harvested areas. Although the area allocated to maize still accounts for an important part in the overall crop land, the number of hectares has decreased considerably since 1990 (a 37% decrease in the period 1990-2012) (Figure 3.15). The same is true for other grains, as well as for cotton. The total areas dedicated to beans, vegetables, and potatoes have remained relatively stable while important variations can be observed for the rice area (Figure 3.16) (MADR, 2014). The “Agricultural Exporting Bet” (*Apuesta Exportadora Agropecuaria*) project aims at increasing crop land by 2.8 million ha between 2006 and 2020, while also reducing the area dedicated to traditional exportable products such as coffee and sugar cane in order to increase the area dedicated to other crops with export potential.

Table 3.5. Changes in the composition of the value of agricultural production, 1991-2012 (%)

	1991	2000	2012
Crops, including:	64.7	59.6	53.8
Coffee, green	11.2	9.2	7.7
Plantains	6.8	7.0	5.7
Rice, paddy	3.2	5.8	5.0
Potatoes	4.3	3.6	4.7
Bananas	4.5	3.5	3.5
Sugar cane	9.7	6.0	3.5
Palm oil	1.1	2.2	3.3
Cassava	7.9	4.1	2.7
Maize	2.3	2.7	2.5
Tomatoes	1.4	1.8	1.9
Beans, dry	0.8	1.4	1.6
Avocados	0.2	0.4	1.3
Onions, dry	1.2	3.1	1.0
Livestock, including:	35.3	40.4	46.2
Cow milk, whole, fresh	10.3	13.4	13.7
Chicken meat	7.5	8.0	12.9
Beef	11.2	11.8	12.7
Hen eggs, in shell	4.0	4.8	3.8
Pigmeat	1.7	1.9	2.6
Total	100.0	100.0	100.0

Source: FAOSTAT (2014).

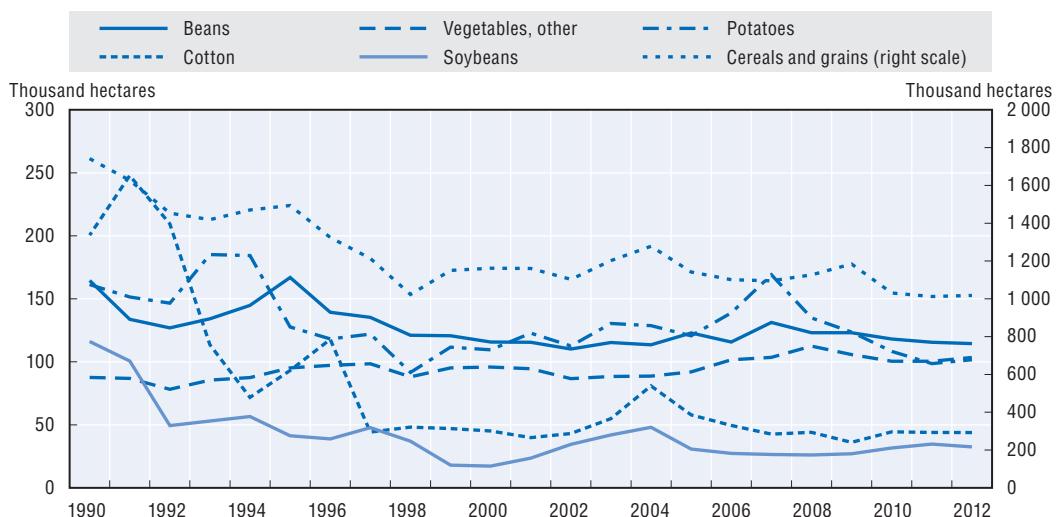
Figure 3.14. Composition of crop area, 1990-2012



Source: MADR (2014).

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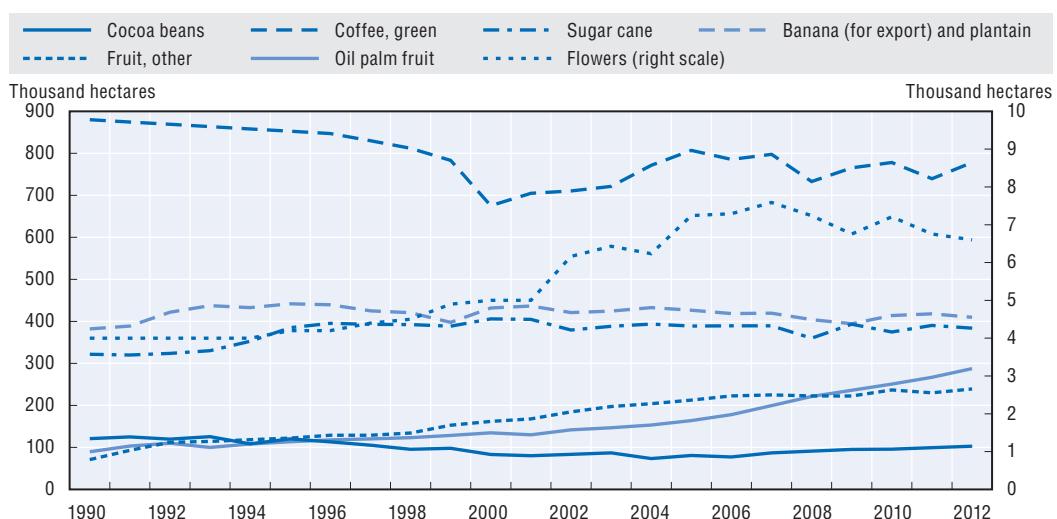
Among food crops, rice, cassava and maize are the most important. During 1990-2000, cereal crops and short-cycle oilseeds experienced notable declines in production. The only major short-cycle crops to have escaped the negative trend of the 1990s were rice and potatoes (Figure 3.17). Colombia produces a wide range of tropical and exotic fruit; 83 out of 433 types of edible fruit in the country are commercialised. Favoured by an increase in land area, improved production processes and increasing demand from consumers in international markets, the total production of fruit grew by more than 300% since 1990 (FAOSTAT, 2014).

Figure 3.15. Land allocated to temporary crops, 1990-2012

Note: Cereals and grains groups maize, rice, sorghum, wheat, and barley.

Source: MADR (2014).

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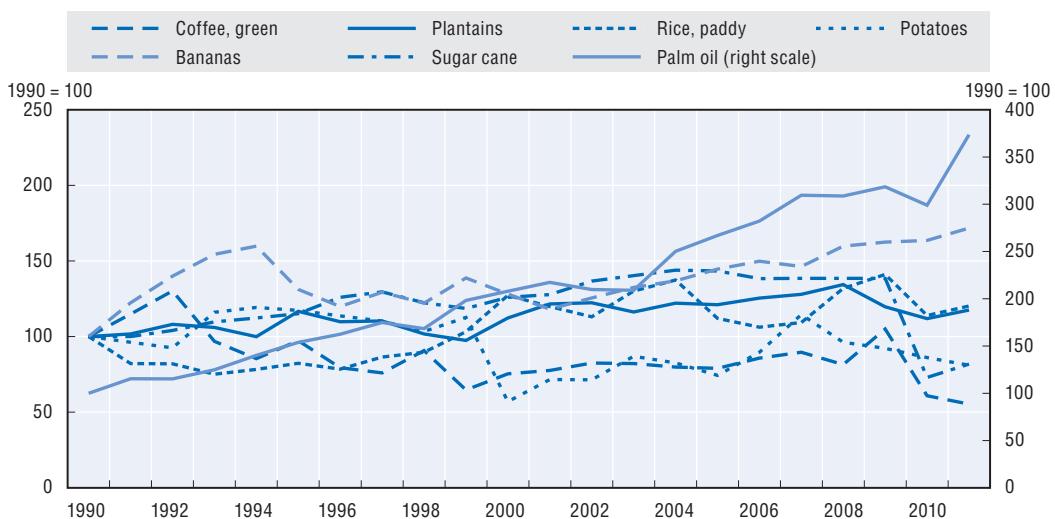
Figure 3.16. Land allocated to permanent crops, 1990-2012

Source: MADR (2014).

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The production of coffee has fallen compared to 1990 levels. Colombia is the third-largest coffee producer in the world, following Brazil and Viet Nam, providing approximately 12% of world production of Arabica coffee. It is the leading producer of the Colombian mild Arabica variety. The collapse in 1989 of the international coffee export quota system should have favoured Colombia as consumers increasingly preferred mild *arabicas* and higher-quality coffee. However, this breakdown generated lower and more volatile international prices at the beginning of the 1990s. This and the dismantling of the domestic price support system that was administered by the Colombian National Federation of Coffee Producers (FEDECAFE) created a situation in which small landowning coffee growers experienced

Figure 3.17. Changes in crop production, 1990-2011



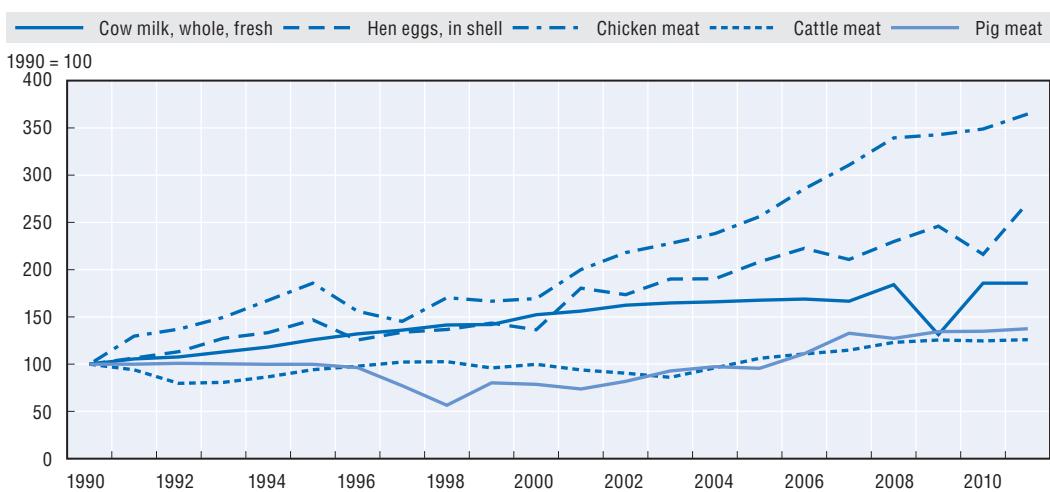
Source: FAOSTAT (2014).

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declining returns and increased market insecurity. This resulted in lower investment in new trees and poorer maintenance of existing ones. Moreover, the costs of production increased, which also contributed to lower production (MADR, 2005). Colombia is seeking to expand its coffee exports through increased production of “specialty coffee” varieties (Cenicafé, 2010).

Colombia ranks fourth among Latin American countries in cattle farming, following Brazil, Argentina, and Mexico. It is the ninth-largest producer of beef in the world, and the largest in the Andean region. Six per cent of cattle are raised exclusively for dairy purposes (1.5 million), 58% are raised exclusively for meat (13.7 million), and 36% for both meat and milk (8.2 million). Poultry farming has grown faster than other livestock enterprises owing to the use of modern techniques. Production grew almost four times over the last two decades (Figure 3.18), and poultry meat currently represents 12.9% of the total value of agricultural production, compared to 12.7% for cattle meat (FAO, 2006; FAOSTAT, 2014).

Figure 3.18. Changes in livestock production, 1990-2011



Source: FAOSTAT (2014).

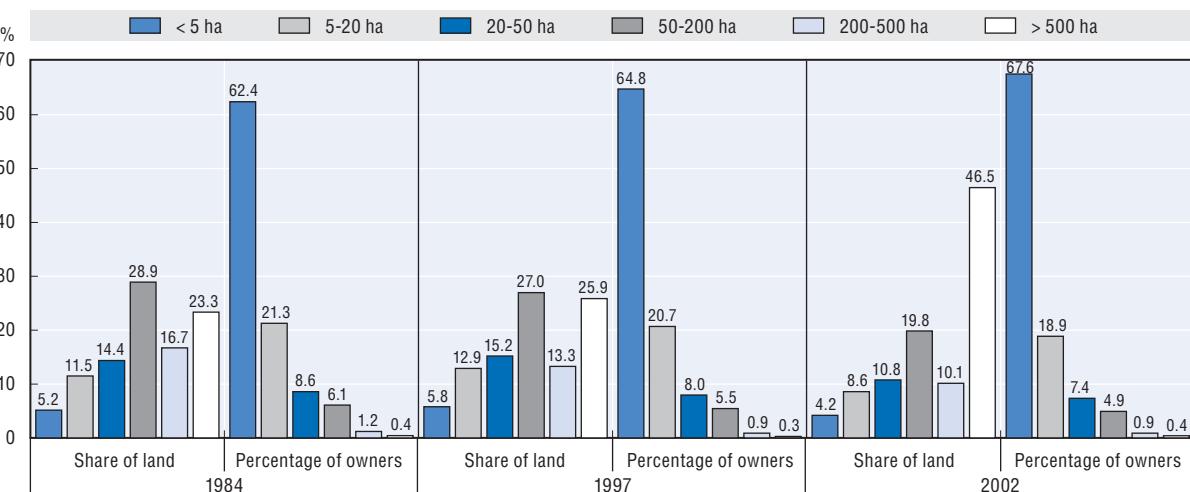
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Farm structures

As was noted earlier, land tenure patterns have remained highly concentrated since the first agrarian reform efforts in the 1930s. The causes of land concentration in rural areas are diverse. While various policies have been adopted in response, their success was limited (Deininger et al., 2004). Contributing to this has been the absence of clear, harmonised criteria across government institutions to define small, medium and large farms based on which agricultural policy can be designed and implemented. The last national agricultural census, conducted in 1971, showed that 10% of farms held 80% of the land, a situation that has not significantly changed (FAO, 2006). The number of landless workers is estimated at 1 million, representing about a third of the population engaged in agriculture.

The information on farm structures collected by the Geographic Institute Agustín Codazzi (IGAC) over the last decades has largely depended on changes to cadastral records (certification and registration of land),¹ the inclusion of new departments in official statistics, as well as the mixed outcomes of land redistribution efforts (Annex 3.A1). In the 1980s, 23% of Colombia's land surface was controlled by 0.4% of land owners, while only 5% of land was owned by 62% of land owners (Figure 3.19). Rural property concentration deepened during the period 1990-2010 as a result of increases in the size of many existing plots and the acquisition of new properties by those who were already owners. Departments with higher land concentrations show lower levels of growth, whereas those with more equitable distributions have higher rural income levels (Ibañez and Muñoz, 2010; IGAC, 2012).

Figure 3.19. The evolution of land concentration in Colombia, 1984-2002



Note: The figure exhibits the percentage of land and owners distributed across six intervals of farm size.

Source: Based on IGAC (2012).

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The Colombian Institute of Rural Development (INCODER) Family Agricultural Unit (UAF) definition² shows the same pattern of ownership (Table 3.6). The departments with the highest proportions of smallholdings are Cauca, Boyacá, Nariño, Antioquia, Cundinamarca, Caldas, and Santander. Micro and small landholdings are important in terms of production across all regions. In general, family farms produce temporary crops such as wheat, potato,

Table 3.6. Farm structure using UAF measurements, 2009

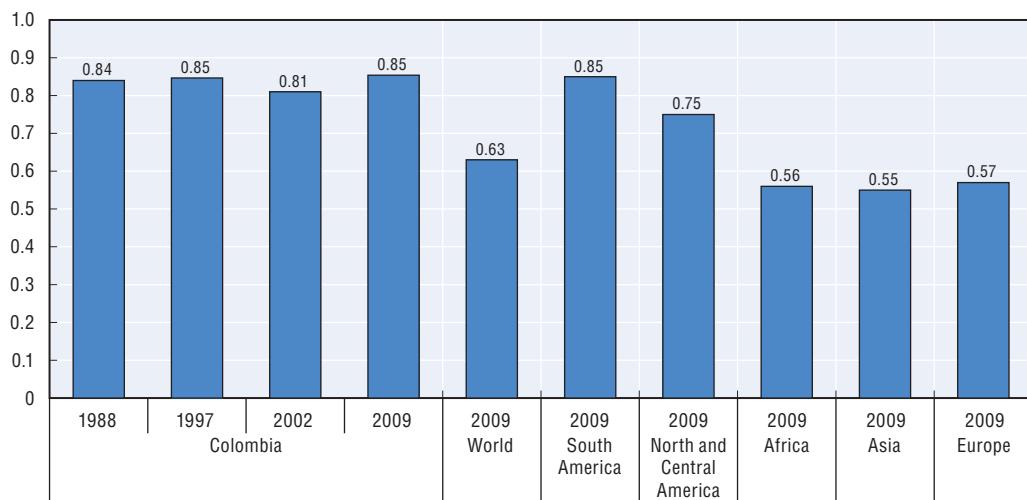
Farm classification (according to UAF)	Land area (%)	Number of properties (%)	Land owners (%)
Micro landholdings (less than 0.5 UAF)	10.59	80.49	78.31
Smallholders (between 0.5 and 2 UAF)	19.1	13.66	14.72
Median landholdings (between 2 and 10 UAF)	18.2	4.99	5.83
Large farms (higher than 10 UAF)	52.2	0.86	1.15

Source: UNDP (2011) (based on Acción Social PTTP, 2010).

beans, and vegetables. They do produce some permanent crops, in particular cassava, cocoa, plantain, fruit, and *panela* cane (UNDP, 2011).

The Gini index for land inequality in Colombia averaged 0.84 during the period 1988-2009, with inequality increasing in the period 2000-09 (Figure 3.20). This is similar to the South America average and higher than the average for North and Central America, Africa, Asia, and Europe. When land concentration is calculated not only in terms of property size, but also by the number of properties owned by a single owner, the Gini index rises even more steeply, particularly from 2005 onwards. When controlling for the quality of land, the Gini indices are slightly lower, but the trend persists, implying that land concentration has occurred particularly in regions with poorer quality land. The gap between the Gini index for land and the Gini index for owners significantly widens from 2005 onwards, indicating that land concentration was driven by the growth in land plots and the purchase of new properties by a few owners. In 2000-09, more than half of Colombia's municipalities saw an increase in land concentration. Moreover, a high percentage of the municipalities that show increased concentration during this period are located near the main productive centres of the country (Ibañez and Munoz, 2010).

Figure 3.20. Land inequality (Gini index) in Colombia



Note: The Gini index for land inequality is in the interval of 0 and 1 (0 = absolute equality; 1 = absolute inequality). The regional averages are calculated by IGAC based on FAO data, national censuses and other secondary sources.

Source: IGAC (2012).

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The **average farm size** varies widely between and within regions. This high variation is largely explained by land concentration and production systems for both crops and livestock across departments and municipalities. The departments where the average farm

size is higher also exhibit a high land concentration (IGAC, 2012). In most of the departments, average farm size fell during the period 2000-09 (Table 3.7). In departments where cattle farming is the main agricultural activity, average farm size tends to be higher (FAO, 2006). The average farm size also varies across different crops (Table 3.8) (MADR, 2005).

Table 3.7. Average farm size by region and department, 2009

Atlantic		Oriental		Central		Pacific		Orinoco-Amazon	
Department	ha	Department	ha	Department	ha	Department	ha	Department	ha
Bolívar	31.9	Boyacá	3.9	Caldas	5.8	Cauca	6	Amazonas	22
Cesar	55	Cundinamarca	4.9	Caquetá	69.5	Chocó	38	Arauca	140
Cordoba	21	Meta	110	Huila	12.4	Nariño	4.1	Casanare	109
La Guajira	55	Santander	13.3	Quindío	11.2	Valle del Cauca	13	Guainía	55
Magdalena	40	Norte de Santander	24	Risaralda	7			Guaviare	55
Sucre	16.9			Tolima	13			Putumayo	12.1
				Antioquia				Vaupés	63

Source: IGAC (2012).

Table 3.8. Farm size intervals by selected commodities

Commodity	Small farms	Medium-sized farms	Large farms
Potato	< = 3 ha	3-10 ha	> 10 ha
Rice	< = 10 ha	10-50 ha	> 100 ha
Sugar cane	10-50 ha	100-200 ha	> 200 ha
Panela cane	5-20 ha	20-50 ha	> 50 ha
Banana	< = 10 ha	10-40 ha	> = 150 ha
Plantain	0.1-5 ha	5.1-15 ha	15.1-30 ha
Cocoa	< 3 ha or < 5 ha or < 10 ha (depending on the region of cultivation)	10-50 ha	> 100 ha
Coffee	< 5 ha	5-30 ha	> 30 ha

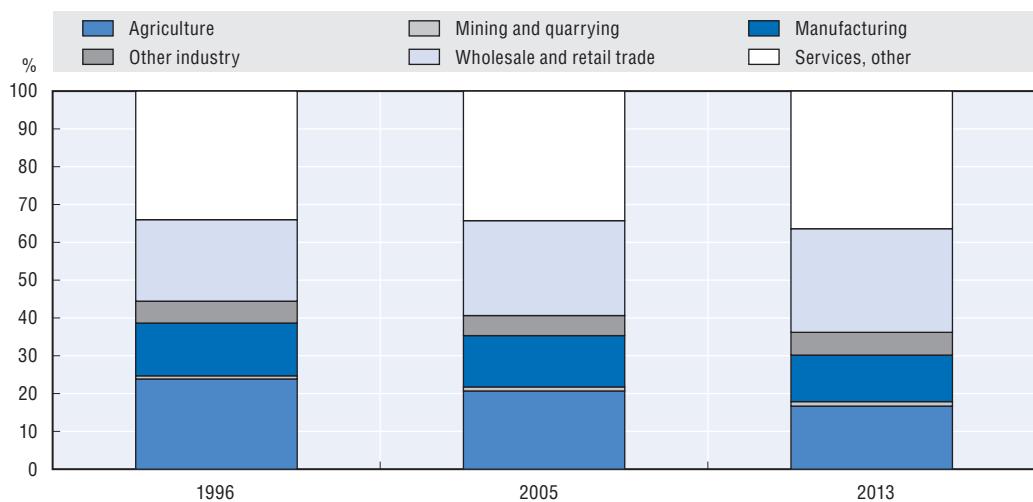
Source: MADR (2005).

Agricultural employment

As was noted above, agriculture's share of total employment has decreased from 55% in 1958 to 17.5% in 2013 (Reyes, 1987; DANE, 2014a), consistent with the normal path of structural transformation. However, as noted previously, Colombia's conflict has severely affected the availability of labour and of employment security in rural areas (DANE, 2014b). Colombia is currently conducting the first agricultural census in 40 years (Annex 3.A2). In the meantime, reliable data are scarce.³ According to available official statistics, the sector currently employs 3.5 million people. The relative importance of agriculture as a provider of rural employment has diminished in favour of the services sector (Figure 3.21). Employment in services sub-sectors such as wholesale trade, retail trade, hotels and restaurants have steadily increased since 1991 (DANE, 2013). This is a similar to the pattern seen across Latin America and the Caribbean region, which is among the most service-oriented regions in the developing world. Indeed, the services sector is the primary provider of employment in the Atlantic, Oriental, Central, and Pacific regions in Colombia (Figure 3.22) (DANE, 2014b).

In rural areas, agriculture continues to generate the largest proportion of employment, almost two-thirds of all employment in 2013 (Galarza et al., 2007; DANE, 2013). The next largest generators of employment, wholesale and retail trade, hotels and restaurants, accounted for only 13% of jobs. Almost half of the agricultural jobs in rural areas occur in the

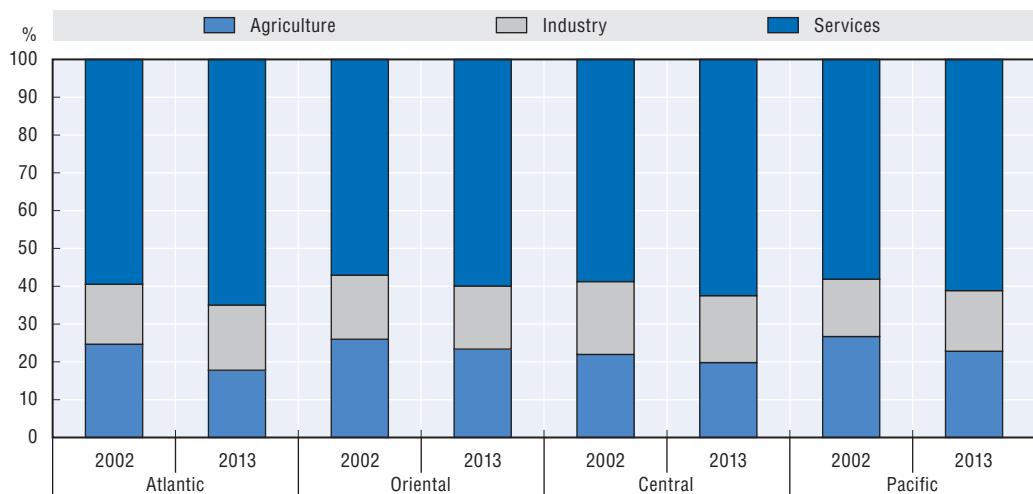
Figure 3.21. Evolution of employment structure by sector, 1996-2013



Source: DANE (2014b).

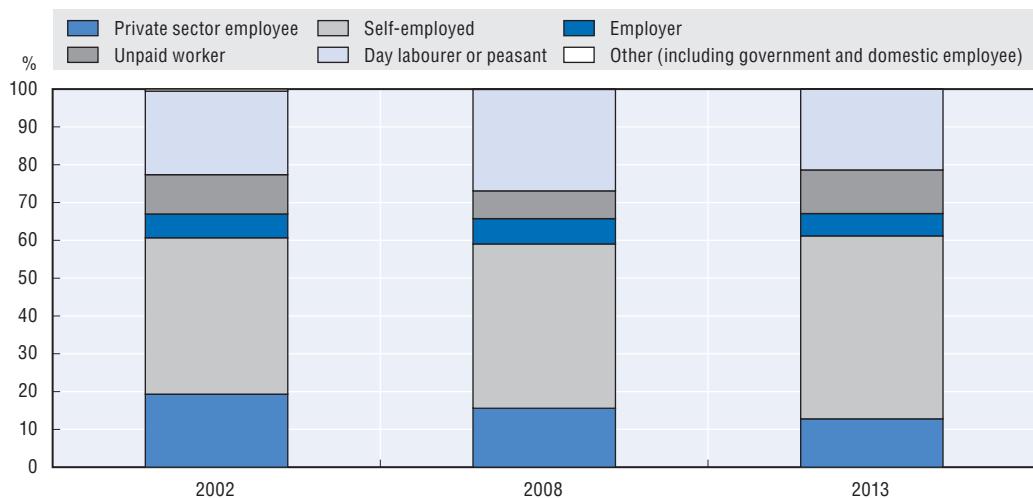
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Figure 3.22. Employment structure by region, 2002-13

Note: Comparable data is available only from 2002 onwards based on the Extensive Household Survey (GEIH) survey.
Source: DANE (2014b).*StatLink* <http://dx.doi.org/10.1787/888933181490>

informal economy, similar to the national average of 52% (COMPITE, 2011). Younger and older persons participate less frequently in the rural job market than in urban areas. Cattle farming activities account for more than 20% of total agricultural employment (FEDEGAN, 2013).

The largest share of agricultural workers is classified as self-employed, followed by private sector employees, day labourers (or farm workers), and unpaid family workers (Figure 3.23) (DANE, 2013). Overall, the largest share of workers in the agricultural sector is currently composed of non-salaried workers⁴ (60%). The number of these workers increased rapidly following the economic recession of 1999-2000. There appears to be an inverse relationship between age and category of employment. While participation among elderly and female workers has been increasing, participation of young people has been declining, partly because as rural Colombians become better educated, they are less likely to seek employment in agriculture (Galarza et al., 2007).

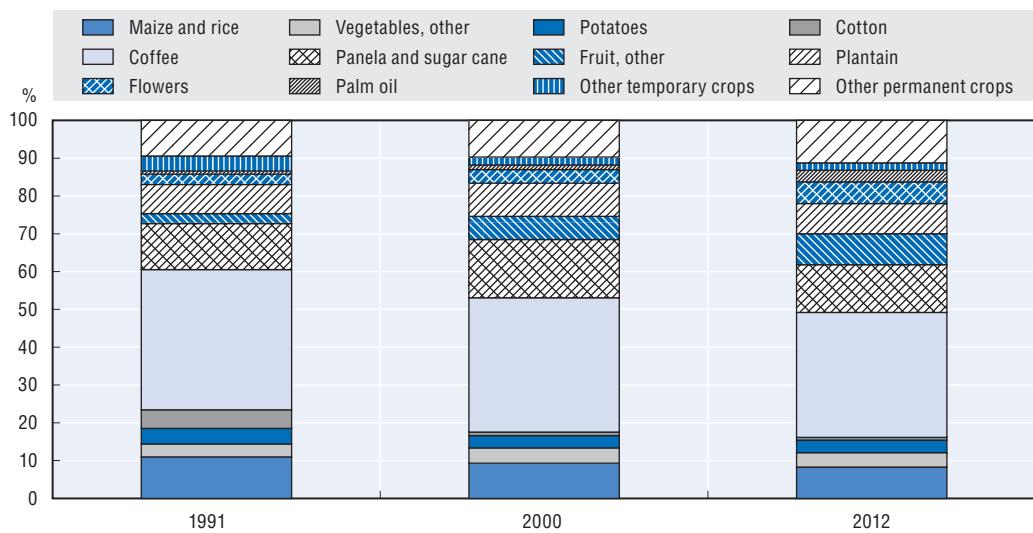
Figure 3.23. Composition of agricultural employment by category, 2002-13

Note: Data is only available from 2002 onwards.

Source: DANE (2014b).

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Coffee continues to provide the largest share of direct agricultural employment, although its share has been diminishing (Figure 3.24). The reduction in employment generated by temporary crops has been counterbalanced by an increase in employment associated to perennial crops, which now generate more than twice the number of jobs that temporary crops do. Direct employment associated with palm oil crops, for example, increased by approximately 300% in the period 1990-2012 (MADR, 2014). Crops that employ traditional cultivation and harvesting practices, as well as a lower use of technology, generate more direct employment.

Figure 3.24. Direct employment generated by crops, 1991-2012

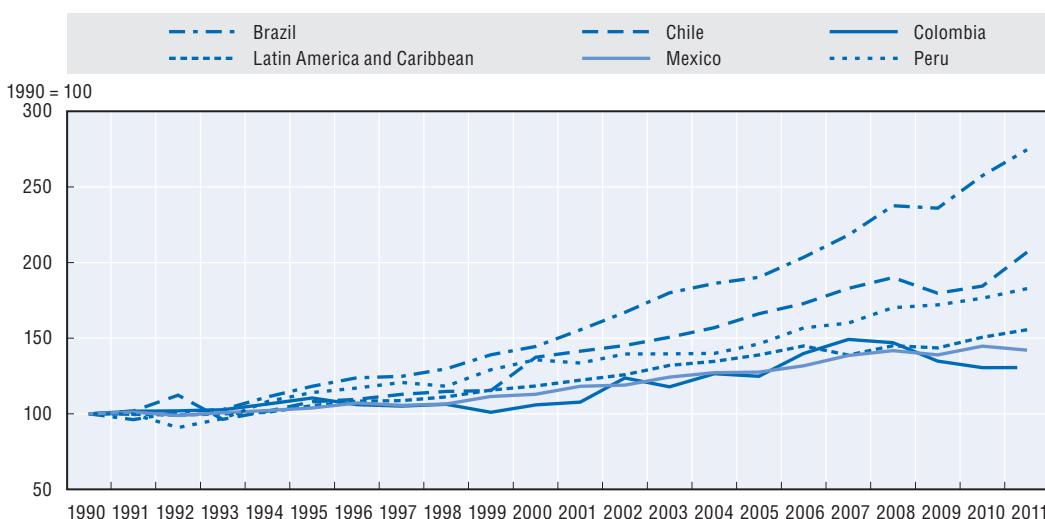
Source: MADR (2014).

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Agricultural productivity

Labour productivity in agriculture has been increasing since 1990, but the pace of growth has slowed considerably since the mid-2000s. In comparison, other countries in the region such as Brazil, Chile, and Peru, have registered solid increases in labour productivity (Figure 3.25). Land productivity has grown more quickly than land-per-worker. Studies suggest that this is because off-the-shelf innovation and production techniques (e.g. improved varieties, pest management, etc.) have been adopted by farmers, and that this has been more important than mechanical improvements (Dias Avila, Romano and Garagorry, 2010). The growth of labour productivity in the industry sector – manufacturing and mining – has outpaced productivity growth in both services and agriculture sectors over the last decade (COMPITE, 2011; DANE, 2014a, 2014b).

Figure 3.25. **Labour productivity growth in agriculture in selected LAC countries, 1990-2011**

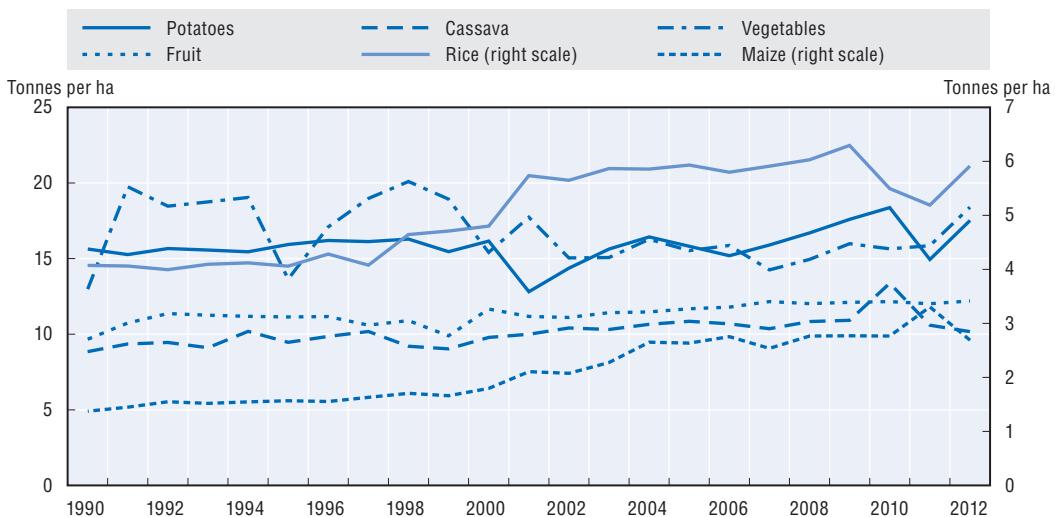


Source: MADR (2014); DANE (2014a, 2014b); World Bank (2014), World Development Indicators.

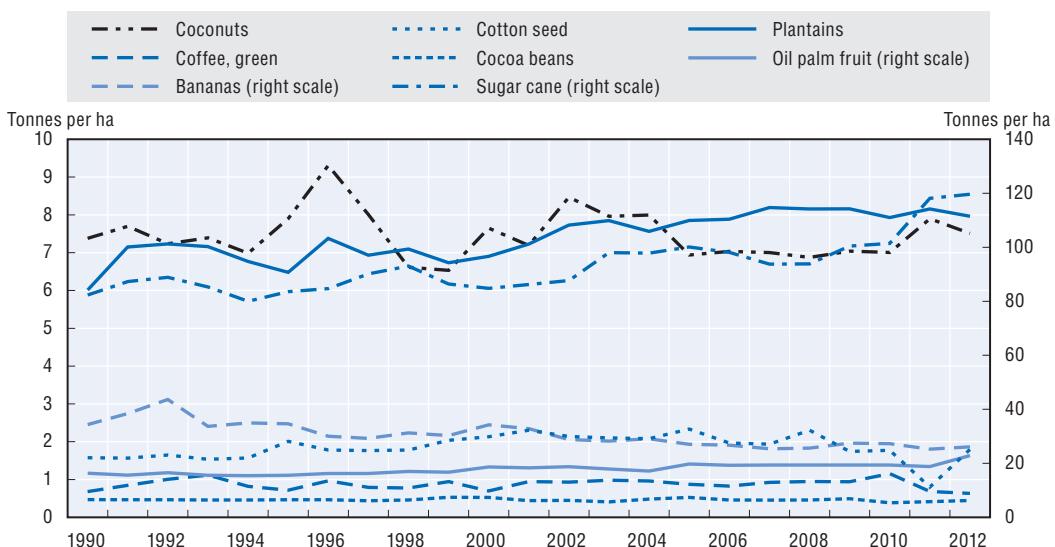
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Improvements in agricultural **land productivity** vary widely across crops (Figure 3.26 and 3.27). In the case of rice, in spite of fluctuations in harvested land areas and production, yields increased in the 2000s. The increases in maize land productivity were driven by the reduction in cultivated areas. Yields for fruit, cassava, and potatoes remained stable during 1990-2012, while yields for other vegetables fluctuated (FAOSTAT, 2014). Land productivity for several of Colombia's perennial crops compares favourably with that of other major producers and exporters. Palm oil fruit yields in 2010 (22.9 tonnes per ha) were, for example, higher than yields in Indonesia and Malaysia (16.7 and 21.9 tonnes, respectively) (FAOSTAT, 2014). The cocoa yield rate is among the highest among major Latin American producers (0.55 tonnes per ha). Colombia has also one the world's highest productivity rates per ha for sugar cane (125.2 tonnes per ha) (FAOSTAT, 2014).

Productivity in Colombia's dairy sector is among the lowest in the region: it is eight times lower than that of the United States, five times lower than the European Union average, and four times lower than in Argentina, Ecuador, or Mexico. Not only is productivity low, but it has hardly increased since 1990 (FAOSTAT, 2014). Colombia's low productivity stems from high input prices, poor transport infrastructure, and the high number of intermediary agents

Figure 3.26. Crop yields for selected food crops, 1990-2012

Source: FAOSTAT (2014).

StatLink <http://dx.doi.org/10.1787/888933181531>**Figure 3.27. Crop yields for selected perennial crops, 1990-2012**

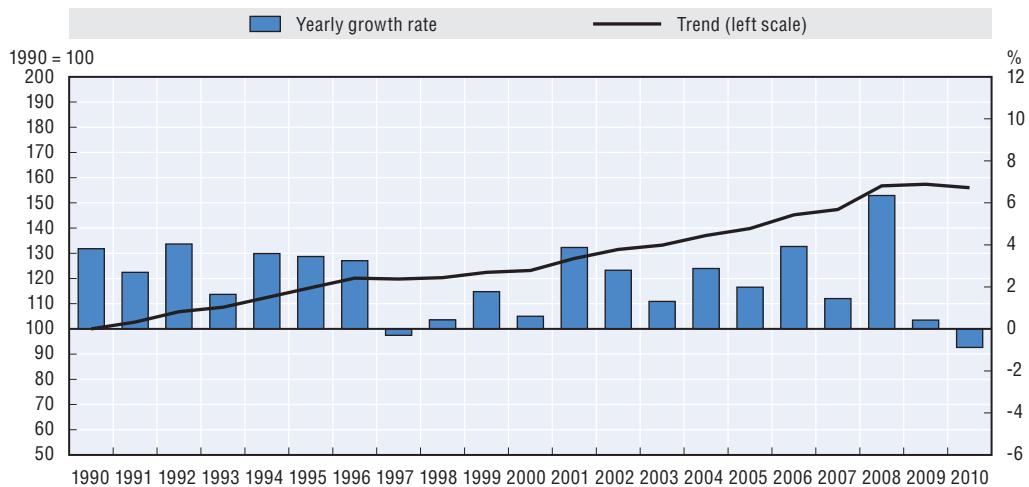
Source: FAOSTAT (2014).

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in the supply chain. Moreover, a large proportion of the milk is not adequately processed; 47% is processed using traditional techniques (FEDEGAN, 2013).

Overall gains in productivity, that is the part of output growth not accounted for the growth in inputs, are captured by Total Factor Productivity (TFP), which compares all of the land, labour, capital, and material resources employed in agriculture to total crop and livestock output. Fuglie and Rada (2013) estimate that Colombia's average yearly growth in TFP has been 2.34%. TFP grew faster in the period 2001-10 than during the 1990s. However, the pace of TFP growth has slowed in recent years (Figure 3.28). Ludena (2010) estimates that most of the TFP growth originates in the livestock sector, especially in pig and poultry

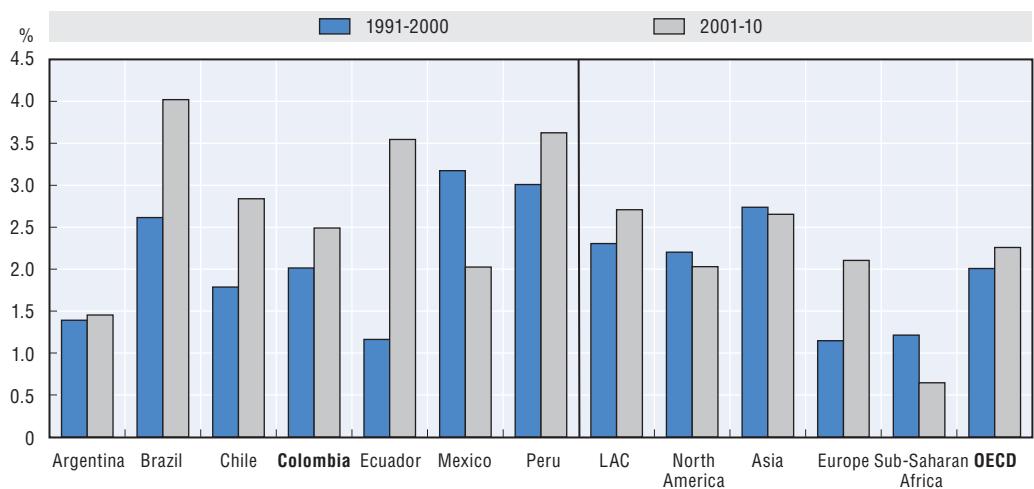
Figure 3.28. Evolution of total factor productivity in Colombian agriculture, 1990-2010



Source: Authors' calculations based on Fuglie and Rada (2013), "International Agricultural Productivity", ERS, USDA.
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farming. In Colombia, as in other Latin American countries, it appears that TFP has been driven by technological change rather than changes in efficiency (Ludena, 2010; Trinidad, 2012). Although Colombia's performance improved significantly in the 2000s, its average TFP growth for that decade appears less sustainable than in the cases of Brazil, Chile, Ecuador, or Peru (Figure 3.29) (Fuglie and Rada, 2013).

Figure 3.29. Total factor productivity in agriculture in selected countries, average annual growth rates, 1991-2010



Source: Based on Fuglie and Rada (2013), "International Agricultural Productivity", ERS, USDA.
StatLink <http://dx.doi.org/10.1787/888933181569>

According to Fuglie and Rada (2013), the largest contributions to growth in the Colombian agricultural output can be attributed to improvements in agricultural TFP, followed by the increased intensity of input use per hectare of agricultural land (Table 3.9). Expansions in irrigation and agricultural land had a very low or even negative contribution to the growth of agricultural output in the most recent period.

Table 3.9. Sources of growth in agricultural output (%), 1981-2010

	1981-90	1991-2000	2000-10
Expansion of irrigation to cropland	0.004	0.004	0.000
Expansion of agricultural land	0.016	-0.760	-1.400
More inputs per ha of agricultural land	1.073	0.303	1.526
Improvements in agricultural TFP	1.453	2.013	2.491

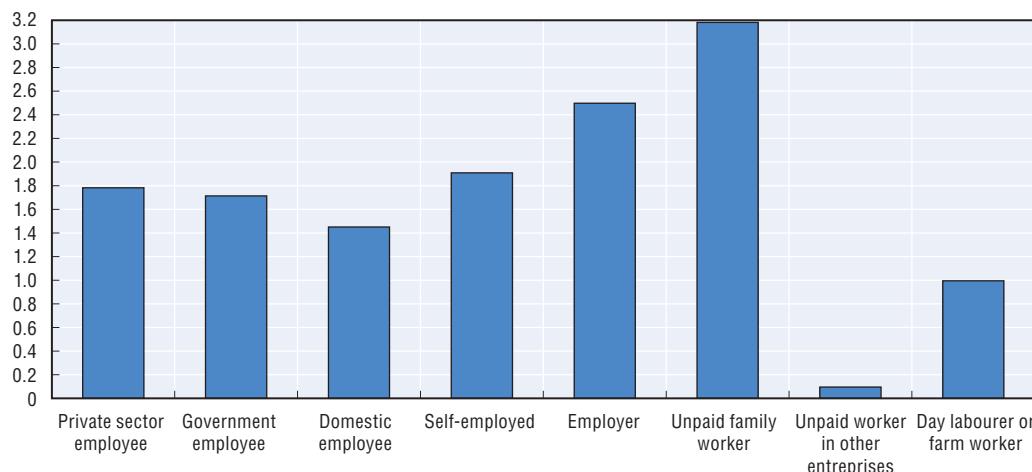
Source: Based on Fuglie and Rada (2013), "International Agricultural Productivity", ERS, USDA.

Farm incomes and social situation

Two factors deeply affected the level and pattern of incomes in rural areas. On the one hand, the rise of illicit drug-related activities created new jobs in cultivating, processing, and exporting, of which the greatest number were in cultivating the coca plant. Earnings were often as much as twice what could be earned in the production of legal crops (Hudson, 2010). On the other hand, forced displacement as a result of the armed conflict reduced incomes because most of those displaced in rural areas earned their livelihoods in crop cultivation (CSPD, 2009).

Rural workers receive lower incomes than urban workers across nearly all categories (Figure 3.30) (DANE, 2007). Agricultural incomes have increased only slowly over the last two decades owing to low productivity increases (Valdés et al., 2010). This sector has the highest percentage of workers with an income below the minimum wage level (Galarza et al., 2007; DANE, 2014).

Figure 3.30. Urban-rural income ratio by category of employment, 2006-07



Note: The urban-rural income ratio is obtained by dividing the urban to the rural income for each selected category of employment.

Source: Authors' calculations based on DANE (2007), Income and Expenditure Survey (*Encuesta de Ingresos y Gastos*).

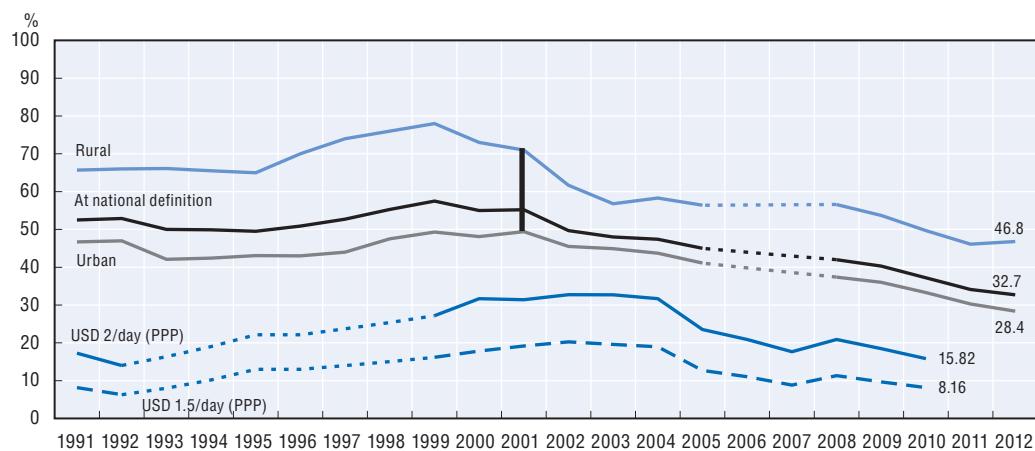
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From the early 1990s until the beginning of the recession, the proportion of people with more than one income-earning activity decreased. During the recession at the end of the 1990s, however, there was a dramatic increase in the proportion of people with more than one income-earning activity, particularly among the poorest segments of the population. Overall, as the number of economic activities increased in rural areas, rural family incomes have moved away from dependency on agricultural earnings to diversified

income streams in which non-farm rural incomes, remittances, and other transfers increasingly contribute (Galarza et al., 2007).

The steady economic progress over the last two decades has been accompanied by considerable reductions in the incidence of **poverty**, although the rate of poverty remains much higher in rural areas than in urban areas. **Monetary poverty** – a measure of monetary household income – declined steadily between 2002 and 2012 in both urban and rural areas (Figure 3.31). By this measure, rural poverty is currently 47%, while urban poverty is 28%. In comparison, using either the World Bank definition of absolute poverty at USD 1.25 PPP/person/day or a broader definition of poverty at USD 2 PPP/person/day, the rates and magnitude of poverty in Colombia declined (World Bank WDI, 2013).

Figure 3.31. Poverty headcount rates at national and international poverty lines, % of population, 1991-2012



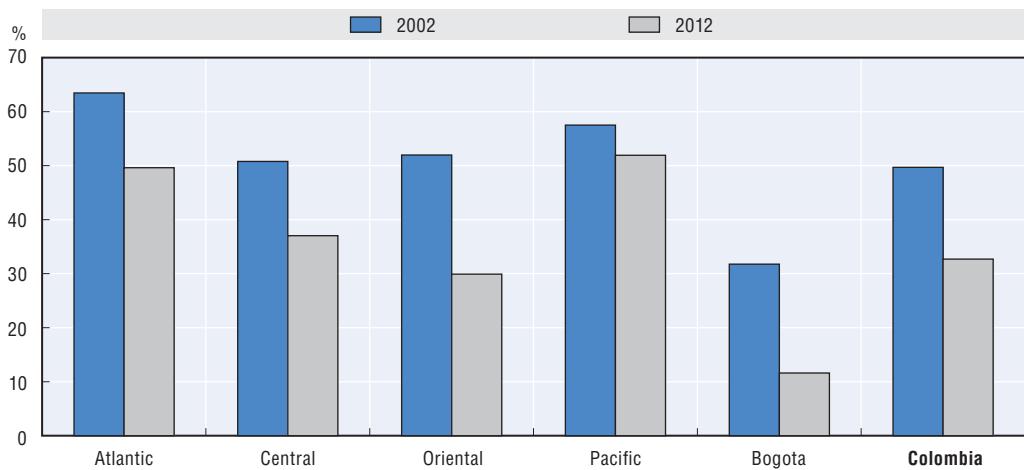
Note: The methodology for measuring monetary poverty went through various modifications during the last two decades. The background data for calculating monetary poverty comes from household surveys conducted by DANE, which have experienced changes in data collection methodology over 1990-2013. Different adjustments were made with respect to the national poverty line as well as to the components of the household income considered. A project for ensuring the comparability of employment, poverty and inequality data series covering 2002-10 was set up in 2010 by DNP, DANE, World Bank, and ECLAC. National data is not available for 2006-08. In 2001, the methodology used for establishing the national poverty line changed. Data at international definitions of poverty is not available for 1993-95, 1997-98 and 2011-12. For the years poverty rates are not available, missing data has been replaced by trendlines.

Source: National data obtained from Galarza et al. (2007) (for 1991-2001) and DANE (2014) (for 2002-12); poverty incidence at international poverty line is based on World Bank (2014), World Development Indicators.

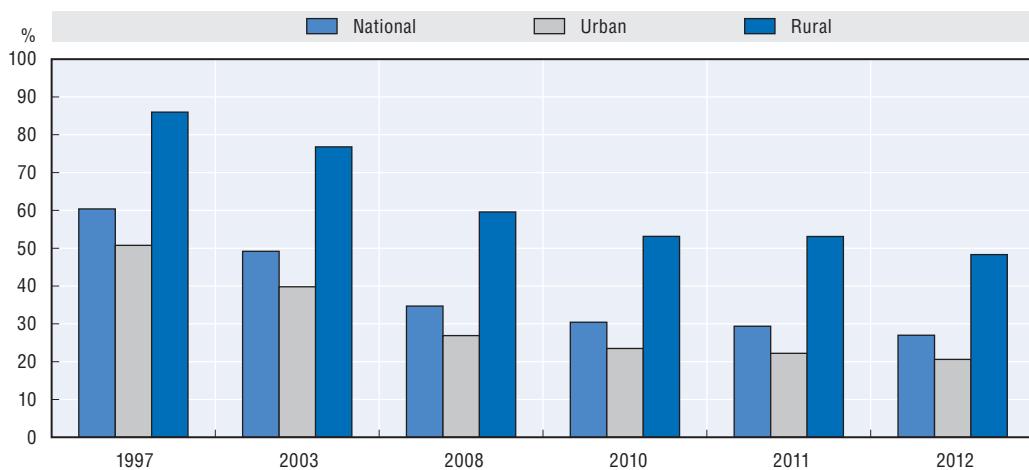
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Rural poverty rates are higher than the urban poverty rates for the entire period, a typical pattern for developing countries. All departments have registered important declines in poverty over the period 2002-12 (Figure 3.32); nevertheless, almost half of the rural population remained below the poverty line in 2012 (DANE, 2014a).

A second measure of poverty assesses the quality of life. The Index of Multidimensional Poverty (IPM)⁵ assesses household education conditions; childhood and youth condition; labour; health; and access to household utilities and living conditions in order to arrive at a broader indicator of social and health-related aspects of poverty. Data since 1997 show that multidimensional poverty has also been declining in both urban and rural areas, but remains twice as high in rural areas (Figure 3.33). The conditional cash transfer programme *Familias en Acción* implemented by the Colombian government in 2000 has been instrumental in reducing multidimensional poverty rates (Box 3.5).

Figure 3.32. Evolution of poverty headcount rates in selected regions, 2002-12

Source: DANE (2014a).

StatLink <http://dx.doi.org/10.1787/888933181597>**Figure 3.33. Index of Multidimensional Poverty, 1997-2012**

Note: The index shows the percentage of population living in multidimensional poverty.

Source: DANE (2014a).

StatLink <http://dx.doi.org/10.1787/888933181600>**Box 3.4. Social policy for financial inclusion: *Familias en Acción***

The increase in poverty at the end of the 1990s as a result of the economic crisis was accompanied by a fall in school attendance and nutritional intake among poorer households. To combat this, the government introduced social programmes alongside its anti-poverty programmes. *Familias en Acción* (Families in Action) has been one of the most important conditional cash transfer programmes. It provided cash to poor households with young children on the condition that the children attended school and followed preventive health care measures. When launched in 2000, the programme was implemented exclusively in rural areas: by 2002 it had reached 300 000 families in 627 municipalities that had fewer than 100 000 inhabitants. It was so successful that the government expanded *Familias en Acción* to cover all 1 100 municipalities in the country.

Box 3.4. Social policy for financial inclusion: *Familias en Acción* (cont.)

According to DNP estimates, without *Familias en Acción*, extreme poverty would be 1.2 percentage points higher than it is currently and the Gini index for income inequality would be 0.5 percentage points higher. The programme has increased both the level and quality of food consumption. In particular, household consumption of items rich in proteins (milk, meat, and eggs) has increased by around 22 000 Colombian pesos (COP) per month on average, and the average consumption of items rich in cereals has increased by approximately COP 15 000 per month in urban areas and around COP 9 000 in rural areas. Furthermore it has led to redistributing family income in favour of child education or clothing expenditures in all areas. The programme increased school participation rates among 14-17 year-old children by between 5 and 7 percentage points. It also increased the enrolment of younger children by between 1 and 3 percentage points despite the already high participation rates in this age group.

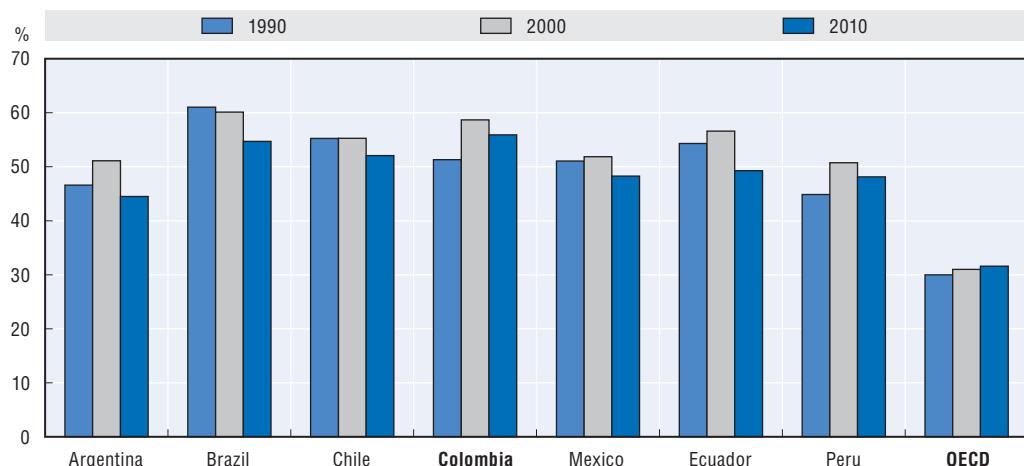
Nevertheless, challenges remain, such as increasing the proportion of eligible families participating in the programme in each municipality, extending the number of municipalities covered by the programme, as well as ensuring long-term financing for the programme out of domestic resources (ODI, 2006).

The programme reached more than 829 000 rural households in 2010, a number that dropped to 600 000 in 2012. Therefore, the programme *Mas Familias en Acción* (More Families in Action) was developed with the aim of increasing the proportion of families eligible to participate and further reducing income inequality (DPS, 2013).

Source: Attanasio and Mesnard (2005); Attanasio et al. (2010); Displaced Population Statistics (DPS) (2013).

High levels of inequality remain characteristic of the country (OECD, 2013). The Gini index shows that income inequality in Colombia is currently above 50%, similar to other Latin American countries (Figure 3.34). In contrast to regional peers such as Argentina, Brazil, Chile or Mexico, Colombia's inequality was higher in 2010 than at the beginning of the 1990s (57% compared to 52%) (World Bank WDI, 2014). Income inequality in Colombia is

Figure 3.34. Gini index for income inequality in Colombia and other countries, 1990-2010



Source: World Bank (2014), *World Development Indicators*.

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mainly driven by the high unemployment rate, very large informal sector, and wide wage range in the formal sector reflecting a large education premium for those with higher education. Income is highly concentrated: the top 1% of earners account for 20% of total income, more than double the OECD average (Joumard and Londoño-Vélez, 2013).

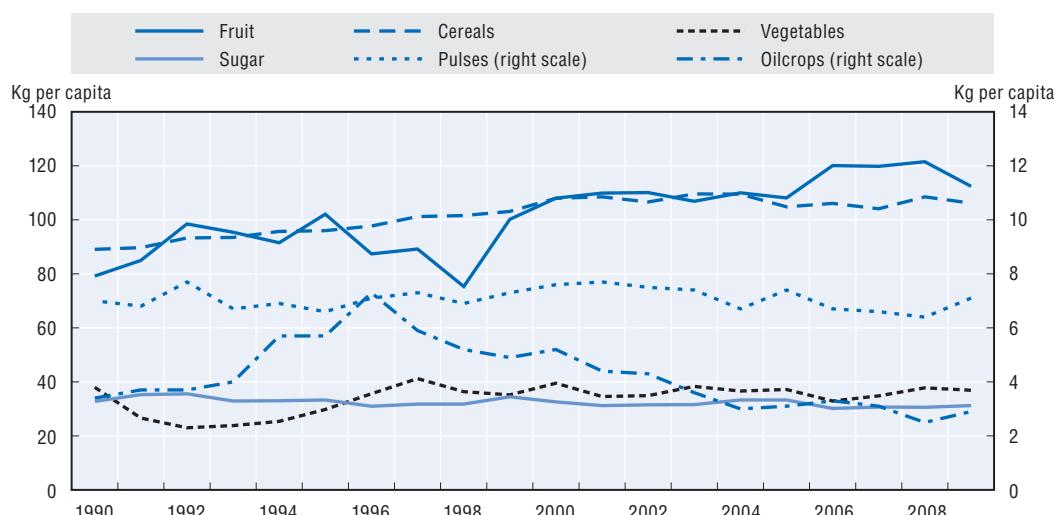
Food consumption

The available daily energy intake per person rose from 2 394 kcal in 1990 to 2 717 kcal in 2009, according to FAO data. This was lower than in the United States (3 738 kcal) and in some Latin American countries such as Argentina, Brazil, Chile, or Mexico (3 183), but higher than in Ecuador or Peru (FAOSTAT, 2014). On the other hand, the 2010 National Survey of Nutritional Status (ENSIN) showed that the actual average dietary energy intake for Colombians aged between 2 and 64 years was only 1 758 kcal. According to this study, almost 65% of the population did not receive the daily recommended calorie intake. This number was higher in rural areas (73%) than in urban areas (60%).

The latest 2007 Survey of Income and Expenditure found that rural households spend more on food products and non-alcoholic beverages than any other category of goods and services, a higher proportion than in urban areas, which highlights the difference in income levels between urban and rural areas. Urban households spend much more on housing, electricity, gas and water, and other goods and services than they spend on food (DANE, 2007).

Cereals consumption increased during the 1990s and early 2000s before falling slightly, which is consistent with the pattern seen when incomes increase (Figure 3.35). Milk and fruit consumption has also been increasing since 2000. Approximately half of the Colombian population currently consumes milk and fruit daily. Meat consumption has also been increasing at a faster pace since 2004 (Figure 3.36). However, 30% of the population does not consume any meat product on a daily basis. Consumption of fish and seafood has increased from 2000 but remains low. Consumption of eggs, oil crops, pulses and vegetables has remained stable (FAOSTAT, 2014).

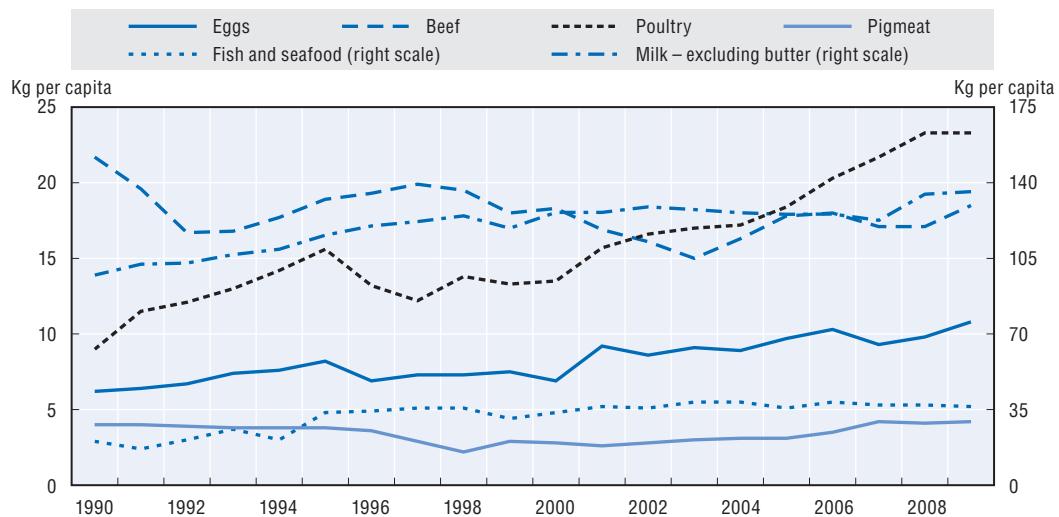
Figure 3.35. Food consumption per capita in Colombia for selected crops, 1990-2009



Source: FAOSTAT (2014).

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Figure 3.36. Food consumption per capita in Colombia for selected livestock and fish products, 1990-2009

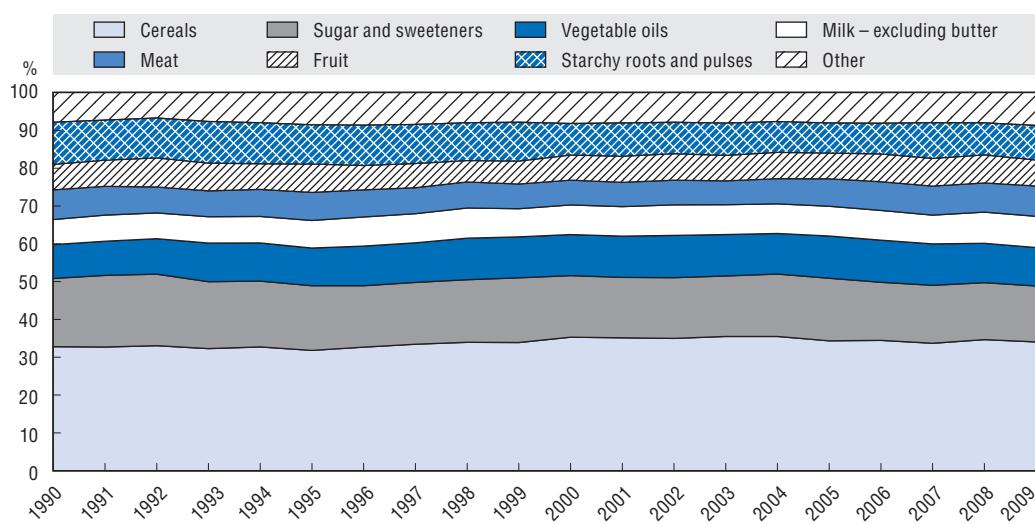


Source: FAOSTAT (2014).

StatLink <http://dx.doi.org/10.1787/888933181631>

Overall, vegetal products accounted for 80% of the daily calorie intake in 2009, while animal products accounted for 20% (Figure 3.37). The proportion of daily calorie intake from plant-based products in Colombia is higher than in many OECD countries. Cereals account for the highest share of daily energy intake (34% in 2009). It is important to note that sugar and sweeteners account for the second largest proportion of daily energy intake (14.8%). Vegetable oils, starchy roots and pulses altogether contribute 19.3%. Vegetables only account for a small proportion of the total. Consumption of livestock products remains much lower than in high-income countries or in neighbouring countries. Although meat consumption appears to have increased, the contribution of meat to daily energy intake has

Figure 3.37. Daily energy intake by commodity group, 1990-2009



Note: Other includes eggs, vegetables, oil crops, fish and seafood, beverages and prepared food.

Source: FAOSTAT (2014).

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remained essentially unchanged, primarily because meat is still consumed in small daily quantities (FAOSTAT, 2014).

Undernourishment and **food inadequacy** rates in Colombia are higher than in other Latin American countries such as Argentina, Brazil, Chile, Mexico, and are higher than the Latin American average. Nevertheless, Colombia has made sustained progress during the period 1990-2013, although this was interrupted in mid-2000 when many poorer households reduced the number and size of their daily meals as a consequence of the economic crisis (FAO, 2013; Rawlings et al., 2002).

Colombia has also made important progress in **child nutrition**. In 2010, 0.9% of children under the age of 5 were affected by wasting. This rate was lower than in Argentina, Brazil and Mexico (FAO, 2013). The prevalence of underweight children, as well as of stunting and wasting, is higher in rural areas, where malnutrition is twice that in urban areas. The *Familias en Acción* programme has helped: following the implementation of the programme, it is estimated that the average height for 9- and 12-year-old children in rural areas increased, while there has also been an important reduction in stunting and instances of being underweight for the group aged 9 to 15 years (Attanasio et al., 2012).

Thirty-six per cent of Colombians suffer from daily protein deficiency, a figure that rises to 48.5% in rural areas. The prevalence of vitamin A deficiency in daily energy intake is 12.8% for children aged 4-8 years and reaches 45.6% for adults aged 51-64 years. Obesity is also becoming a problem: 14% of Colombians are considered obese. Increasing incomes, primarily in urban areas, make it possible to acquire more food, and an increasing number of households are eating pre-prepared meals. Ten per cent of children between the ages of 10 and 17 are overweight, as are 46% of adults in the 18-64 age group (ICBF et al., 2005).

Trends in the upstream and downstream sectors

Input supply systems

The agrochemicals industry – makers of **fertilisers**, **pesticides** and **herbicides** – in Colombia consists of domestically owned companies and subsidiaries of multinational companies, as well as companies resulting from mergers between foreign and domestic enterprises. As was previously noted, **fertilisers** constitute a very important share of the total cost of production of crops (MADR and ANDI, 2007). The market for fertilisers containing the main three compounds (urea, phosphate, and potassium) represented four-fifths of fertiliser sales in 2006. The markets of these three main compounds are relatively concentrated in Colombia, with six companies accounting for 94% of sales. The production of fertilisers is highly dependent on imports of raw materials. The pesticides and herbicides industry is dominated by a large number of multinationals subsidiaries (DNP, 2010; CONPES, 2009). The production and supply of fertilisers in Colombia does not depend exclusively on manufacturing plants, but also on producers' associations that import, mix and distribute fertilisers to their members.

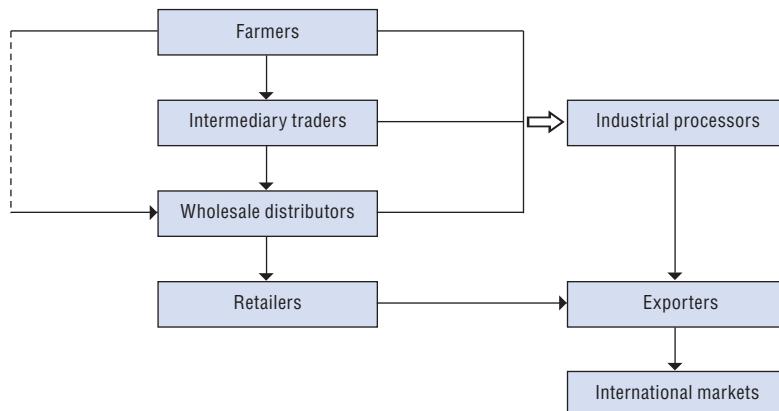
The market for **seeds** has been expanding over the last 10 years, particularly for cotton, maize, and sorghum. Colombia seed exports have also increased, reaching a value of USD 8.9 million in 2008. The main destination markets are the Dominican Republic, Ecuador, Guatemala, Honduras, Mexico, Peru and Venezuela. The main exported seeds were maize, palm oil and rice. However, the value of seed imports is five times higher than the value of Colombia's seed exports. The main imported seeds are hay, maize and palm oil (SAA, 2009).

There are two parallel domestic seed production and supply systems: a formal system of limited reach and a much larger informal (or traditional) system. The supply of seeds for small and medium producers largely occurs through the informal system. In the formal system, the Colombian Agricultural Institute (ICA) controls the production of certified seeds and monitors imports. It establishes the specific minimum requirements for seed production and commercialisation to ensure quality and plant disease resilience. The use of non-certified seeds through the informal system remains widespread. For instance, it is estimated that only 1% of potato producers use certified seeds; the rest use non-certified seeds obtained from previous harvests, neighbouring farms, local collection centres, or local wholesale centres. This low rate of certified seed use is similar to that in other South American countries. In contrast, 90-95% of producers in the United States and the European Union use certified seeds. The main reason certified seed is not more widely used is its perceived high cost – a large share of certified seeds are imported – and the relative ease with which farmers can produce or acquire seeds they believe to be of acceptable sanitary quality. In cases where producer associations are important actors in the cultivation and production process, such as in the coffee sector, these associations are often in charge of distributing certified and disease-resilient seeds.

Marketing channels for outputs

The most typical **marketing channel** linking farmers with domestic and international traders is shown in Figure 3.38. However, there is a wide variation from this “standard” depending on the commodity, whether it is exportable, and on the involvement of producers’ associations. Producers are usually linked to wholesalers through intermediary traders. In some cases, producers bypass these intermediary traders, taking responsibility for the marketing of their harvests. However, this is usually not the case because farmers do not have the necessary means to sell to wholesalers directly, owing either to insufficient storage facilities or, more often, because of poor infrastructure. In the case of vegetables, for example, it is estimated that only 17% of producers act as their own intermediary. Transactions between farmers and middlemen are conducted at the farm gate, or at local marketplaces and collection centres. Wholesale distributors are usually located within larger supply centres (*centrales de abastos*). Once products reach these supply centres, they are sold

Figure 3.38. Standard marketing channel for agricultural commodities in Colombia



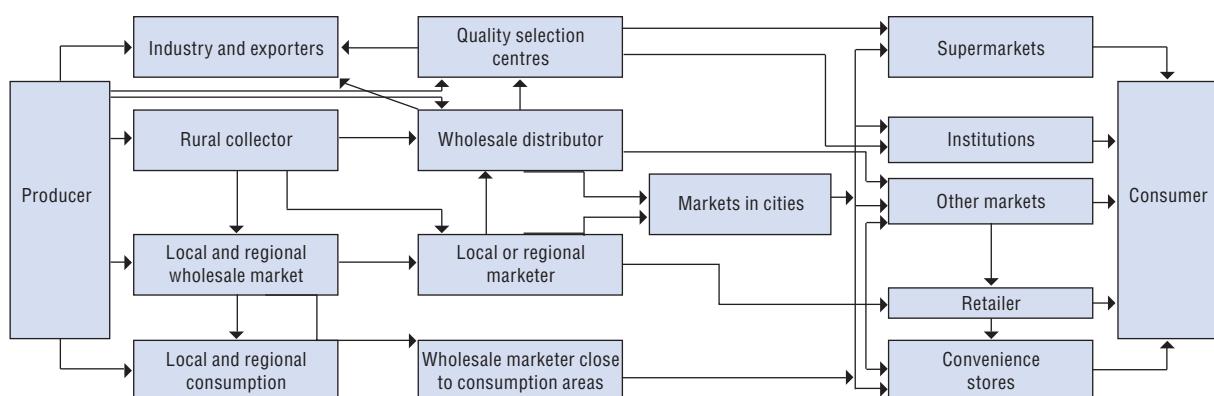
Source: Based on Superintendence of Industry and Trade (SIC) (2012).

to other supply centres or to marketplaces. The largest wholesale distributors also provide goods directly to supermarkets (Superintendence of Industry and Trade (SIC), 2012).

The retail marketing channels can be classified as traditional or modern. Traditional retailers include local market places, convenience stores, specialty stores, and small supermarkets. Modern channels include the large supermarket chains. The latter have become the largest distributors of food products in urban areas. In rural areas, food products are mostly distributed through convenience stores and local market places. Industrial processors are responsible for the processing of primary goods (SIC, 2012).

Linkages between smallholders and agro-industries have been increasing, as have small-scale rural processing activities, both on-farm and in villages. The links between smallholders and agro-industry are most notable in the cases of coffee, milk, and palm oil, but they have also been intensifying for some fruits, *panela*, and potatoes. Direct links between small-scale producers and exporters are especially strong for plantain, *granadilla*, and *uchuva* (World Bank, 2003). The example of the value chain for potatoes shows that the linkages between producers and final consumers can be much more complex (Figure 3.39) (SIC, 2012).

Figure 3.39. Example of supply chain for potato in Colombia

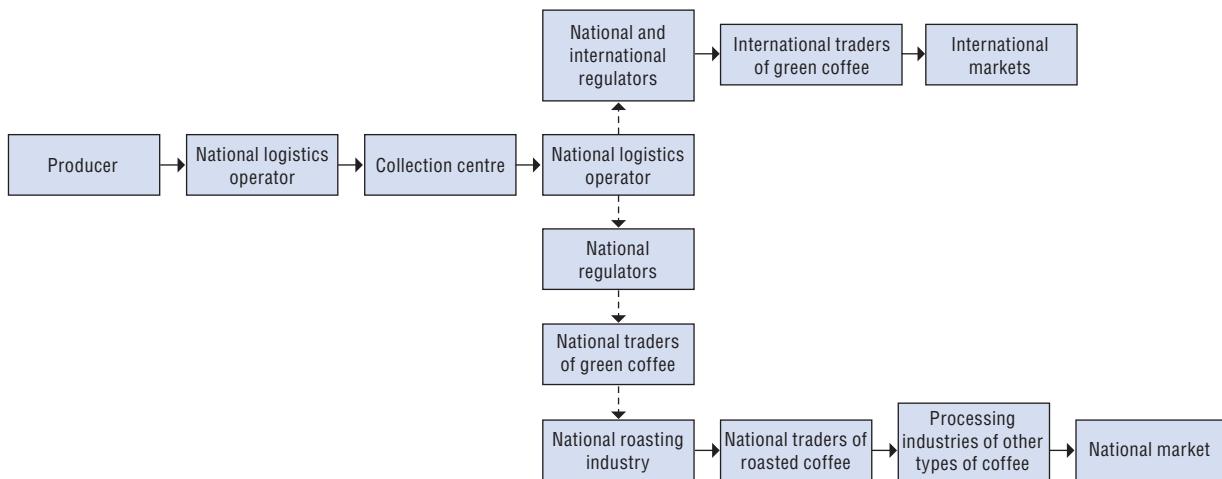


Source: Based on SIC (2012).

The example of coffee, Colombia's main exportable agricultural product, highlights the involvement of producer associations in the marketing channel. There is a purchase order of coffee from coffee growers through the network of purchasing points of producers co-operatives, Almacafé (official coffee storage warehouses), and the National Federation of Coffee Growers. National logistics operators participate in different parts of the chain, for example as parties that purchase crops, or that distribute and sell green coffee. National regulatory entities represent the associations and other national entities, providing support to farmers through activities such as research, training, and promotion, and determining a stable system of internal prices, among others (Figure 3.40) (García Cáceres and Olaya Escobar, 2006).

From the mid-1990s until recently, the government has been trying to support "associations for production" by co-ordinating the creation of "strategic alliances" between smallholders and agribusinesses. The government assumed that integrating agricultural value chains through "productive alliances" would bind the smallholder associations' development to that of agribusinesses. To a certain extent, this rural development policy privatised the function of providing technical or financial support to smallholders and

Figure 3.40. Example of supply chain for coffee in Colombia



Source: García Cáceres and Olaya Escobar (2006).

their organisations. However, results have been overall modest. The integration of smallholders into agricultural value chains has not been possible in most cases due to remaining structural challenges in the sector. Initiatives such as creating co-operatives have not thrived except for products such as coffee or milk, while the significant number of intermediaries in the chain reduces farmers' margins (MADR, 2005).

Food industry

Food processing is one of the largest and most important sectors in the economy, accounting for 28% of industrial production and 22% of total employment. The agri-food and processed food sector has seen solid growth since the 1990s due to rapid urbanisation and demand for convenient, processed food. Colombia is a major producer of many intermediate and consumer-ready categories, such as sauces and spices, dairy products, or breakfast cereals. The Colombian food-processing sector depends heavily on imports for ingredients. Multinational companies are increasingly entering the market, creating alliances with domestic enterprises.

Wholesale and retail trade

Every major city has a large wholesale distribution market (*central de abastos*). Wholesale distribution markets in seven cities across Colombia account for almost 80% of the volume of agro-food products traded in such markets nationally. The Wholesale Distribution Markets Network (*Red de Centrales de Abastos de Colombia*) is an alliance integrating 11 such markets across Colombia (FAO, 2010). None of the major wholesale markets set aside a specific allocated space for the direct sale of smallholders' products (FAO, 2010).

Corabastos (*Corporación de Abastos de Bogotá S.A.*) in Bogota is the most important wholesale distribution market in Colombia. It covers more than 420 000 m². An important market for grains and processed foods before the supply chains for these products became more closely integrated, Corabastos remains the primary market for perishable products. Corabastos also acts as a warehouse and main auction market, and handles large quantities of perishable products for retail sale. It acts as a price setter for food products and functions as a spot market: 6 500 wholesalers meet daily to trade food products directly from producers

and sell them to another 6 000 retailers. Many of the wholesalers are also retailers, and there is a significant number of informal traders. Corabastos supplies food for nearly 10 million people in the Central region and other central markets in the main cities (USDA GAIN, 2010). More than 12 000 tonnes of agro-food products are traded daily.

All of the major wholesale distribution markets face similar challenges. These include congestion, lack of hygiene, product traceability issues, security, and appropriate infrastructure. There are difficulties in meeting standards across all activities – packaging, handling, transport, waste management – which result in waste and financial losses. These are ultimately transferred to consumers through higher prices.

The food retail sector in Colombia is one of the most modern in Latin America and is the 25th largest in the world, with estimated sales of USD 10 billion in food products in 2009. In recent years, foreign groups have purchased stakes in leading Colombian retailers, and there are a greater number of hypermarkets, which are increasingly important distribution channels. Colombian store-brand products have a strong presence among processed food products; however, it appears that large numbers of end-users purchase directly from suppliers and/or manufacturers abroad, avoiding local representatives. The primary retailers appeal mainly to upscale and middle-income shoppers, as the shift from essential to high-quality foods continues. However, low-income groups take advantage of reduced price campaign sales and premiums offered by large stores. Despite rapid modernisation in the retail food sector, traditional small, family-owned stores and gas-marts remain one of the most important distribution channels in the country. They represent 52% of the retail food market. They offer basic products, carry small inventories, and service mostly middle- and lower-income consumers. Mini-markets, a blend between small-size stores and supermarkets, are better-equipped and are increasing their market share. This market is increasingly important to domestic wholesalers distributors. The high percentage of sales in small stores is the result of specific consumer needs (USDA GAIN, 2010).

International hypermarkets have brought in new products, forcing the local market to adjust and become more competitive and creative. Rural areas are being explored as a new market niche for mass consumption products. The goal is to open more supermarket/hypermarket stores closer to rural consumer areas and intermediate cities. However, the limited cold storage transportation network remains a limiting factor for the development of this sector (USDA GAIN, 2010).

“Wet” markets (fresh products markets) are part of Colombian traditional markets. Their number, estimated at 2 000, is declining in larger cities. They are supplied by local and regional small-scale production.

Agro-food trade flows

Colombia was a net exporter of agro-food products during the period 1990-2013. However, the gap between exports and imports has been steadily decreasing. The value of agricultural exports decreased in the aftermath of the global economic crisis and the rainy season of 2009-10 that severely affected agricultural production, but recovered in 2011 (Figure 3.41). Integration with international markets remains very low, both on the export and the import side. The ratio of agro-food exports to agricultural GDP (approximately 30%) is meanwhile almost twice that of the ratio of total exports to total GDP (17%). Agro-food imports relative to agricultural GDP remains high compared to the ratio of total imports to total GDP (28% compared to 16%) (Table 3.10) (UN, 2014).

Figure 3.41. Colombia's agro-food trade, 1991-2013

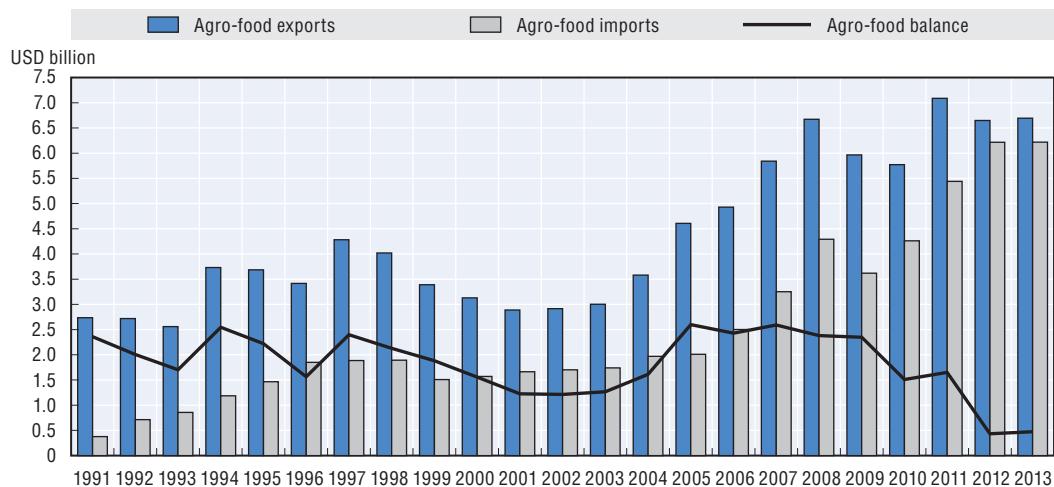
Source: UN (2014), UN Comtrade Database, <http://comtrade.un.org>.*StatLink* <http://dx.doi.org/10.1787/888933181652>

Table 3.10. Agro-food sector's integration with international markets, 1991-2013

		1991	1995	2000	2005	2010	2011	2012	2013
Agriculture, Gross Domestic Product (GDP), current prices	USD billion	7.0	13.0	8.3	11.3	18.7	21.1	22.0	n.a.
Agro-food exports	USD billion	2.7	3.7	3.1	4.6	5.8	7.1	6.6	6.7
Agro-food imports	USD billion	0.4	1.5	1.6	2.0	4.3	5.4	6.2	6.2
Agro-food trade balance	USD billion	2.4	2.2	1.6	2.6	1.5	1.6	0.4	0.5
Coverage degree of imports by exports	%	726	251	199	229	135	130	107	108
Share of agro-food trade in total trade									
Exports	%	38	36	24	22	15	13	11	11
Imports	%	8	11	13	10	11	10	11	11
Ratio of agro-food exports to agricultural GDP	%	39	28	38	41	31	34	30	n.a.
Ratio of agro-food imports to agricultural GDP	%	5	11	19	18	23	26	28	n.a.
Ratio of total exports to total GDP	%	18	11	13	14	14	17	16	n.a.
Ratio of total imports to total GDP	%	12	15	12	14	14	16	15	n.a.

n.a.: Not available.

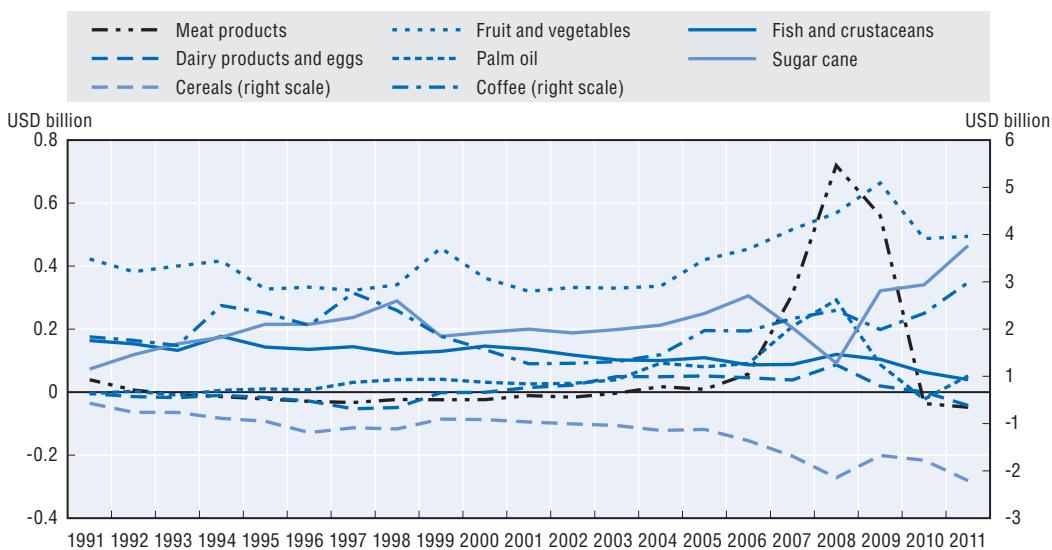
Source: UN (2014), UN Comtrade Database, <http://comtrade.un.org>; World Bank (2014), World Development Indicators.

Agricultural **exports** were the main source of foreign exchange for Colombia until the mid-1980s, accounting for 54% of the total value of exports of goods and services. The share dropped to 31% in the period 1987-99 and to 20% in the period 2000-05. Non-coffee agricultural exports averaged 10% of total exports in 1965-90; that share increased to 15% during 1991-2005. Currently, agricultural exports represent approximately 11% of total Colombian exports. MADR estimates that approximately 61% of Colombia's agricultural output excluding livestock is exportable, 6% is import-competing, and 33% is non-tradable. Agricultural **imports** were relatively small over the period 1965 to 2005, accounting for between 4 and 7% of the total value of imports of goods and services. However, since 2005, they have accounted for more than 10% of total imports (UN, 2014). Colombia's currency appreciated during the period 2008-13 as a result of high commodity prices and this has been reflected in the evolution of terms of trade.

Net exports have been increasing for some product groups such as fruit and vegetables, sugar cane, and meat products. In contrast, the trade balance for cereals has been in deficit

since 1991 and the deficit has been widening since 2006. Despite advantageous conditions for the development of fish and crustaceans production, the trade balance for these categories has remained relatively stable, highlighting the fact that this sector has not reached its export potential (Figure 3.42).

Figure 3.42. Net trade in basic groups of agro-food commodities, 1991-2011



Source: UN (2014), UN Comtrade Database, <http://comtrade.un.org>.

StatLink <http://dx.doi.org/10.1787/888933181668>

Colombia is well positioned within international markets for its traditional exports, such as coffee, extract of coffee, banana, plantain, and flowers. Colombia is the world's second-largest exporter of cut flowers (following the Netherlands); third-largest exporter of green coffee, plantain, and banana; and the fifth-largest exporter of palm oil. However, its shares in world exports have decreased since the beginning of the 1990s (Figure 3.44). Its share of the coffee market, for example, has plunged from 14% in 1990 to 4% in 2010 as a result of lower production levels (Section 3.6) and increased competition from coffee exporters such as Viet Nam and Indonesia, whose market shares of green coffee have risen sharply over the past 15 years, and to the production of Colombian *milds* in countries such as Kenya and Tanzania.

Box 3.5. The importance of fisheries in Colombia

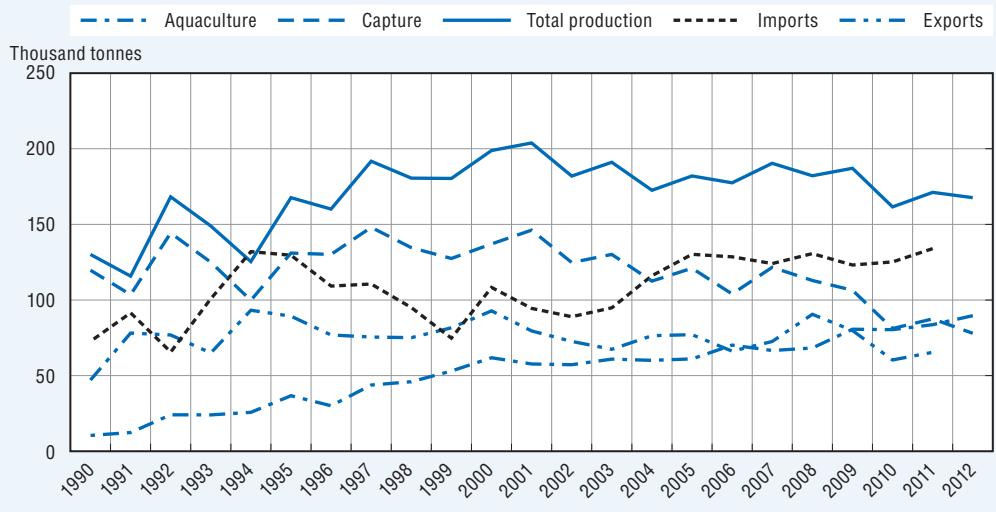
Colombia's industrial fisheries are concentrated in the Atlantic and Pacific Oceans, while small-scale fishing takes place along both coastlines and along inland waters. Colombia's marine fisheries feature a wide variety of species, but catches of each remain small. The tuna fisheries sub-sector is the backbone of the industry.

Fresh and marine water aquaculture took off in the 1980s and both have grown significantly. As Colombia has a variety of relatively constant temperature zones, climates, and microclimates throughout the year, fresh water fish farming is carried out throughout the country (especially in the Central region). Shrimp farming takes place on the Atlantic and Pacific coasts, although the Pacific coast activity has declined due to the frequent presence of pathogens and all shrimp farming suffers as a result of lower quality feed concentrate and the incidence of disease.

Box 3.5. The importance of fisheries in Colombia (cont.)

In 1990-2000, production increased by approximately 6% per year, but then decreased in the following decade by an average of 1.2% each year as a result of falling catches, although gains in aquaculture offset this decline (Figure 3.43).

Figure 3.43. Fisheries production and trade in Colombia, 1990-2012



Source: FAO (2014b), Fisheries and Aquaculture Information and Statistics.

StatLink <http://dx.doi.org/10.1787/888933181673>

Per capita fish consumption remains very low. This is particularly important considering that the Colombian diet is deficient in protein. High- and medium-high income groups prefer shellfish, marine fish, high value added imported products and aquaculture products. Medium- and low-income groups tend to eat river fish, and farmed and canned fish (canned tuna and sardines). The largest consumers of fishery products are the people who live close to inland waterways, the coasts, in aquaculture areas, and in the major cities. These products are not often consumed in other regions due to irregular and/or inadequate supplies, relatively high prices compared with meat products, and the lack of promotional campaigns. Small-scale fishermen and rural aquaculturists consume the products that are not sold.

The fisheries sector remains underdeveloped and constitutes a subsistence economic activity in many regions. The main challenges to the fisheries industry are the lack of know-how, credit, working capital, reliable transportation systems and marketing, and cold storage near fishing areas, as well as a solid institutional framework. Products are distributed through unions and co-operatives to their members, whereas those who work independently sell their catches to middlemen (up to six middlemen can be found in the chain) and to industrial producers. Fisheries remain important in terms of generating employment and income, food security, and promoting regional and local development. Because of its seasonal variability, and because catches are generally small, fishing is not a permanent activity for most fishermen.

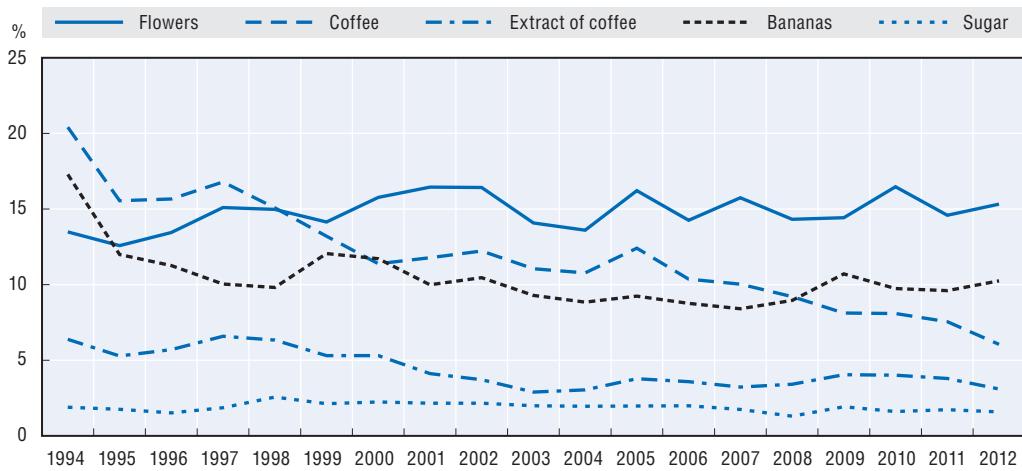
The major difficulties facing marine fisheries include the need to reconvert the fleet and adapt fishing gear and fishing methods to access new resources; the failure of processing plants to fully utilise their operating capacity; the high cost of inputs such as fuel (marine diesel), which is regulated by the national government; and the absence of regulation allowing over-fished resources to recover. Inland fisheries are affected by over-fishing and

Box 3.5. The importance of fisheries in Colombia (cont.)

environmental problems and inadequate processing and conservation methods by fishermen, as well as insufficient infrastructure between fishing and marketing centres. Aquaculture is hampered by the high cost of feed (which accounts for 60% of production costs), small profit margins, insufficient quantities for exports, sanitary problems, and the need to adopt more efficient technologies.

Source: AUNAP (2013); FAO (2003, 2014a).

Figure 3.44. Share of Colombia in world's exports of selected commodities, 1994-2012



Source: UN (2014), UN Comtrade Database, <http://comtrade.un.org>.

StatLink <http://dx.doi.org/10.1787/888933181688>

Coffee, flowers, bananas and sugar products account for around 70% of Colombia's agricultural exports. Until 1987, coffee was Colombia's most important export product, accounting for 44% of total exports; thereafter, its share began to decline, reaching 30% in the period 2009-11. Similarly, the share of exports accounted for by bananas and plantains decreased between 1990 and 2011. Other products whose importance grew include cut flowers (which have accounted for one-quarter of agricultural export earnings during recent years), sugar products, beef, and palm oil (Figure 3.45).

While Europe was the main market for Colombia's agricultural exports at the beginning of the 1990s, it has since been replaced by North America. The importance of the Latin America and Asia regions has also increased (Figure 3.46). The top destination country for Colombia's agricultural exports is the United States, with whom Colombia has recently signed a free trade agreement, lowering tariffs for a wide range of agricultural products. The second destination market is Venezuela, but bilateral exports with this country are only one-eighth of the exports to the United States. Colombia's exports to neighbouring countries such as Chile, Ecuador, Peru, or Mexico are small. Ecuador and Venezuela are important markets for Colombia's dairy exports, mainly milk, and Venezuela is also an important destination for meat and cereals. However, there have been recent disruptions in the trade relationships with these Andean neighbours.

In 2009, the Venezuelan government threatened to stop importing from Colombia altogether after Colombia alleged that Venezuela was providing assistance to FARC and

Figure 3.45. Composition of agro-food exports, 1991-2013

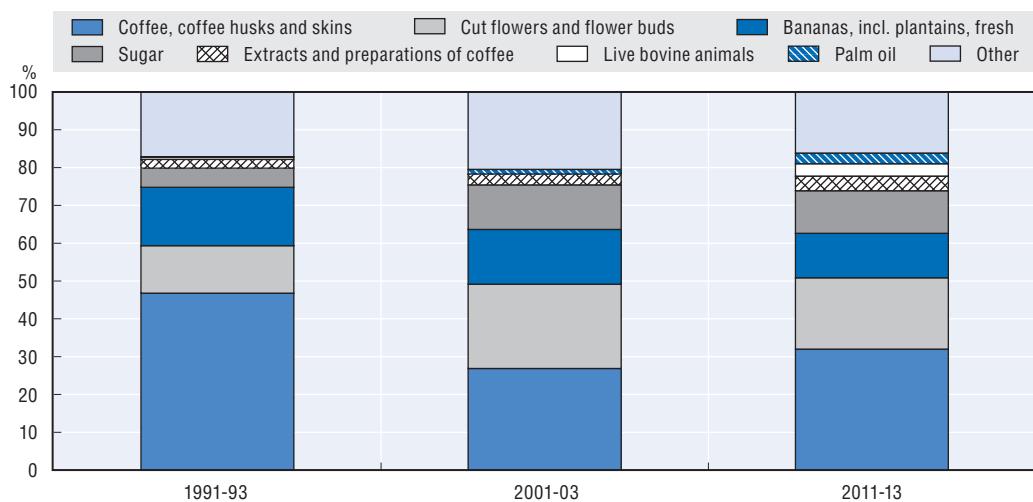
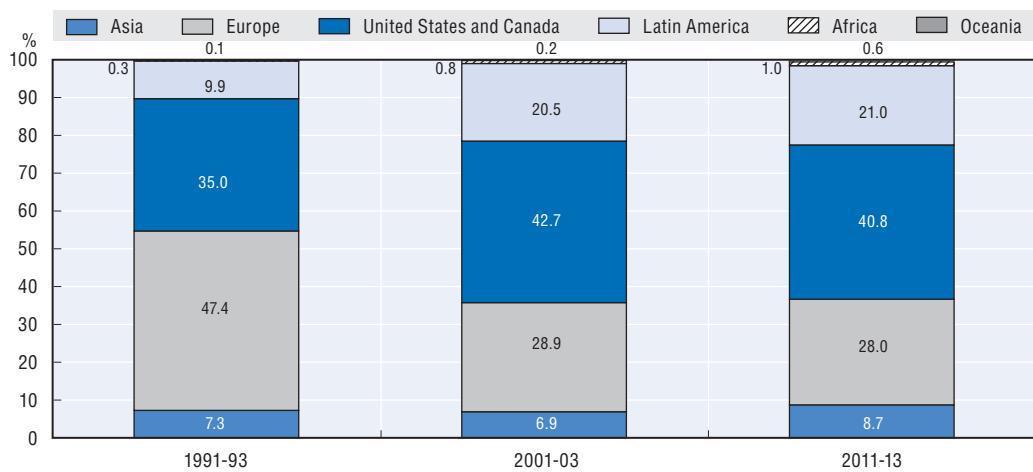
Source: UN (2014), UN Comtrade Database, <http://comtrade.un.org>.*StatLink* <http://dx.doi.org/10.1787/888933181690>

Figure 3.46. Colombia's agro-food exports by region, 1991-2013

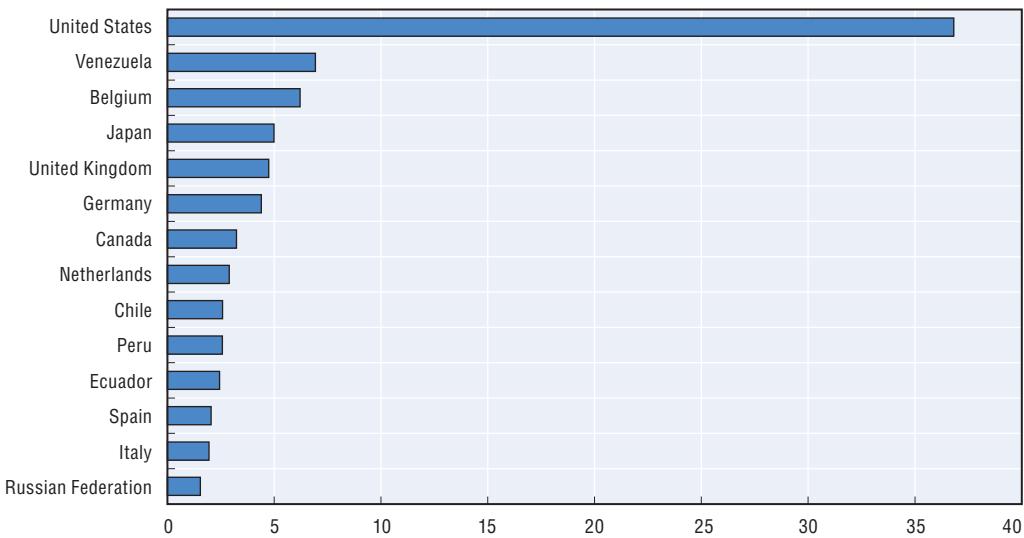
Source: UN (2014), UN Comtrade Database, <http://comtrade.un.org>.*StatLink* <http://dx.doi.org/10.1787/888933181708>

ELN guerrillas. In July 2009, Ecuador raised import tariffs on over 1 000 Colombian goods to protect Ecuadorian producers from cheaper Colombian goods after the Colombian peso depreciated in real terms against the US dollar. Within the European Union, Colombia exports mostly to Belgium, United Kingdom and Germany. On the other hand, several EU countries are becoming very important destinations for tropical and exotic fruit exports. Within Colombia's top ten destination markets, there is no big emerging economy, such as the People's Republic of China (hereafter "China"), India, or the Russian Federation (Figure 3.47).

Colombia's agricultural imports are less concentrated than its agricultural exports in terms of the number of products. Seven groups of products accounted for two-thirds of the total value of agricultural imports in recent years (Figure 3.48). For some products, imports supply a significant amount of total domestic use, exceeding 100% for wheat and barley in recent years (Figure 3.49).

Figure 3.47. Main export markets for Colombia's agro-food products, 2011-13 average

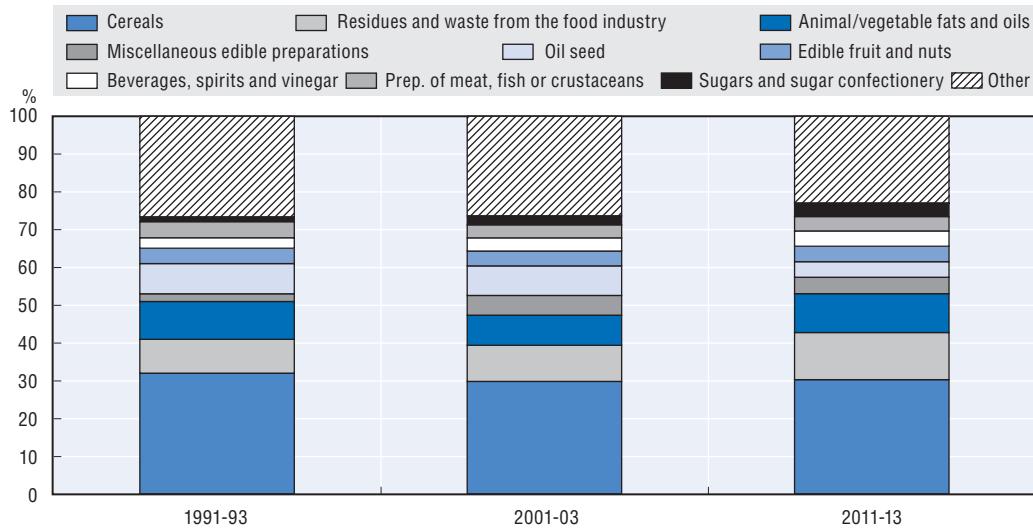
As per cent of total agro-food exports



Source: UN (2014), UN Comtrade Database, <http://comtrade.un.org>.

StatLink <http://dx.doi.org/10.1787/888933181710>

Figure 3.48. Composition of agro-food imports, 1991-2013

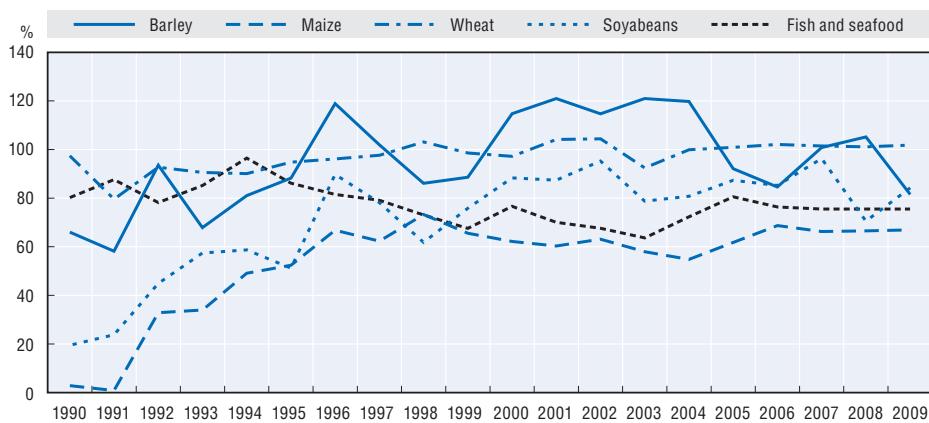


Source: UN (2014), UN Comtrade Database, <http://comtrade.un.org>.

StatLink <http://dx.doi.org/10.1787/888933181727>

Countries within the Latin America region are the main source of **agro-food imports** (Figure 3.50). Argentina and the United States are Colombia's top suppliers of agricultural products (Figure 3.51). The United States are an important supplier of wheat, maize, soybeans, rice, milk powder, poultry offal, while Argentina and Brazil supply mostly cereals, soybean cake, residues and waste from the food industry, animal and vegetal oils, as well as sugar and sugar confectionery. Other important partners are Ecuador, Chile, Bolivia, Peru, and Mexico. Imports from China have been increasing during the last decade and reached USD 2 billion in 2008-10. Overall, Colombia had negative trade balances with

Figure 3.49. Share of imports in Colombia's domestic use of selected commodities, 1990-2009

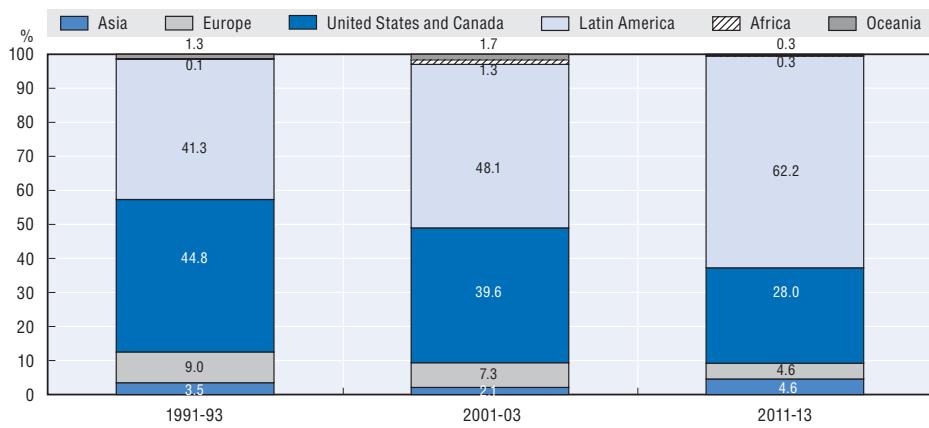


Note: The share is equal to the ratio of imports and domestic supply. Domestic supply is calculated as production + imports - exports + changes in stocks (decrease or increase).

Source: FAOSTAT (2014).

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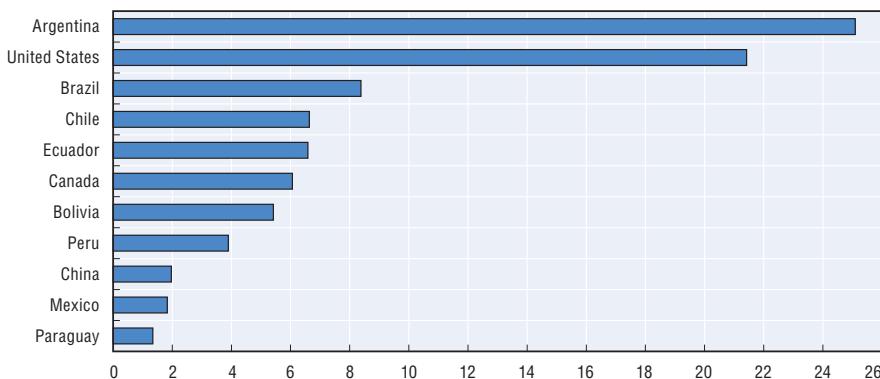
Figure 3.50. Colombia's agro-food imports by region, 1991-2013



Source: UN (2014), UN Comtrade Database, <http://comtrade.un.org>.

StatLink <http://dx.doi.org/10.1787/888933181744>

Figure 3.51. Main suppliers of agro-food products to Colombia, 2011-13 average
As per cent of total agro-food imports



Source: UN (2014), UN Comtrade Database, <http://comtrade.un.org>.

StatLink <http://dx.doi.org/10.1787/888933181754>

its trading partners from the Andean Community and MERCOSUR, both in terms of volumes and values, over the period 2008-12 (MADR, 2013).

Agro-environmental situation

Population growth and the intensification of economic activities are placing pressure on the environment in Colombia. **Biodiversity** faces several threats. Direct threats include the conversion of natural habitats and ecosystems, deforestation, infrastructure development, pollution, intensive use of pesticides and fertilisers, and climate change. Indirect threats include the structure of land tenure, deficiencies in technological development, and weak institutional capacity to reduce the impact of activities associated with biodiversity loss (UNDP, 2010).

During the last 50 years, Colombia has created a system of land ownership rights that links biodiversity policy directly with social policy through three principal mechanisms: the System of National Natural Parks, the indigenous people reserves, and the collective territories of Afro-Colombian communities. Important historical and archaeological heritage sites and indigenous reserves overlap with several protected natural areas of the country. Around 45% of protected areas in the country include indigenous territories, particularly in the Central and Orinoco–Amazon regions. This significant presence of indigenous and Afro-descendant communities in protected areas highlights the importance of including these populations in conservation processes (UNDP, 2010).

The main contributors to **soil degradation** in Colombia include natural factors such as geologic erosion, earthquakes, landslides, and weather changes, as well as anthropogenic factors such as agricultural activities, urban expansion, mining, road construction, and extensive logging. The intensive use of fertilisers and pesticides across the country plays a significant part in agriculture's contribution to soil degradation, as does the obsolete infrastructure that comprises large parts of the traditional irrigation system. The Atlantic and Oriental regions are the worst-affected areas (IDEAM, 2004).

Initiatives in ecological agriculture – avoiding the use of inorganic fertilisers, herbicides, chemical pesticides, or toxic substances – remain in their infancy. In 2008, organic production covered 45 386 ha, of which 82% were certified organic areas and the rest were in the process of conversion. The most important organic products to date include coffee, palm oil, bananas, mango pulp, and sugar. Private and public initiatives have emerged in recent years to encourage organic agriculture (UNDP, 2010).

Water scarcity and **pollution** also represent pressing concerns. Water scarcity in some regions is due to changing rainfall patterns. The quality of water can also be affected by residual domestic and industrial water; residual water from crop cultivation and livestock; transport of dangerous substances such as oil and its derivatives; and water tainted by mining exploitation. As the agricultural sector is the main user of water, water scarcity and pollution pose a serious risk to the development of agricultural activities (IDEAM, 2010).

Air pollution is one of the most widespread and serious problems in Colombia's cities and rural areas and is most critical in the country's industrial corridors (World Bank, 2006). Agriculture is the largest source of Colombia's greenhouse gas emissions (38%), primarily from methane and nitrous oxide from livestock and cultivation. Of this, livestock contributes the majority (70%), while land expansion and cropping activities contribute 26% and 4%, respectively. Livestock activities are projected to contribute up to 85% of total GHG emissions in 2030 (Vosti et al., 2011).

Deforestation results mainly from the expansion of the agricultural frontier; farming; logging; mining; the development of energy resources such as hydroelectricity; infrastructure development; and coca cultivation. Colombia has lost approximately 5.5 million ha of forest since 1990 (Table 3.11). During the period 2005-10, 56% of deforested areas were transformed into pastures (Table 3.12) (SIAC, 2011).

Table 3.11. Deforestation rate by region, 1990-2010

		Region					Total
		Pacific	Orinoco	Caribbean	Andean	Amazon	
1990-2000	Forest 1990 (mil. ha)	5.2	2.34	2.37	12.57	41.92	64.44
	Deforestation (mil. ha)	0.14	0.24	0.34	0.88	1.2	2.8
	% lost forest	2.68	10.3	14.48	6.98	2.86	4.34
	Average yearly deforestation (ha)	14 043	24 058	34 302	87 660	119 802	279 864
2000-05	Forest 2000 (mil. ha)	5.23	2.18	2.01	11.72	40.67	61.81
	Deforestation (mil. ha)	0.15	0.14	0.24	0.49	0.56	1.58
	% lost forest	2.8	6.57	11.74	4.15	1.38	2.55
	Average yearly deforestation	29 254	28 696	47 313	97 293	112 565	315 120
2005-10	Forest 2005 (mil. ha)	5.04	2.12	1.81	11.15	40.1	60.21
	Deforestation (mil. ha)	0.11	0.47	0.2	0.44	0.4	1.19
	% lost forest	2.2	2.19	11.07	3.9	1	1.98
	Average yearly deforestation	22 149	9 307	40 018	87 090	79 797	238 361

Source: SIAC (2011).

Table 3.12. Soil use following deforestation, 2000-10

	2000-05		2005-10	
	Transformed area (ha)	% of transformed area	Transformed area (ha)	% of transformed area
Urban areas	9 585	0.6	123	0
Temporary crops	6 989	0.4	2 197	0.2
Permanent crops	3 750	0.2	873	0.1
Pastures	625 833	39.7	663 901	55.5
Mix of agricultural activities	194 064	12.3	104 852	8.8
Forest plantation	40	0	144	0
Secondary vegetation	552 495	35.1	241 764	20.2
Other vegetation	98 081	6.2	160 379	13.4
Burned areas	5 296	0.3	3 531	0.3
Other areas without vegetation	3 785	0.2	767	0.6
Water surfaces	14 950	0.9	10 898	0.9
No information	60 084	3.8		
Total	15 749 53	100	1 196 331	100

Source: SIAC (2011).

Colombia is vulnerable to **natural disasters** such as floods, droughts, and earthquakes, averaging 2.97 natural disasters per year, the third highest rate among countries in the region. Floods and landslides cause the largest number of natural disasters. It is estimated that more than 4 million Colombians were affected by natural disasters during the period 1993-2000 (World Bank, 2006).

In the past decade, climate variations related to El Niño and La Niña have posed serious challenges to Colombian agriculture, demonstrating that many farmers are not yet able to effectively manage risk of and adapt to **climatic fluctuations** and **shocks**. Instances of

climate variability, higher temperatures, and erratic precipitation are projected to increase. For example, the average annual mean temperature is projected to increase by 2.5 °C by 2050, while precipitation is likely to rise by an average of 2.5%. Higher temperatures will be accompanied by melting glaciers in the Andes (which might fully disappear by 2030) and the disappearance of important moorlands, which are currently significant sources of water. Without accelerated mitigation efforts, climate change is likely to translate into soil degradation and organic matter losses in the Andes hillsides; flooding in the Caribbean and Pacific coasts; losses for crops such as coffee, fruit, cocoa, and bananas; and an increasing prevalence of pests and disease (Lau, Jarvis and Rámirez, 2010). Rising temperatures and unpredictable precipitations are already affecting harvests and moving production to higher altitudes. Preliminary estimates suggest that the annual cost of climate change impacts (e.g. loss of agricultural production, reduced water availability for hydroelectricity, damage to homes, loss of ecosystems) could reach 1.9% of GDP by 2050 (ECLAC, 2013; OECD/ECLAC, 2014).

Box 3.6. Forest management in Colombia

Colombia's 1991 Constitution and related laws set environmental sustainability at the heart of land redistribution efforts. Forest access and tenure are shaped by several distinct but overlapping land and resource tenancy regimes:

- Subsequent agrarian reforms, aimed at dealing with access to land and tenure issues.
- Forest law, which includes regulations to address access and tenure of forest resources. A regime of *resguardos* covers more than 30 million ha (nearly half of the country's forest surface) in forested areas where indigenous people reside.
- Indigenous territories, a regime recognising the unique rights over territories that are the basis of indigenous cultures and livelihoods.
- Protected areas, a regime shaped by conservation laws.
- Subsoil resources regime, asserting that the state retains land ownership and rights to subsoil resources, but providing less clear provisions in relation to long-term security of indigenous land rights.

Therefore, implementation of Colombia's forestry policy is shared among several ministries, advisory bodies and agencies. This institutional framework involves in first instance the Ministry of Environment and Sustainable Development (MADS). MADS has undertaken territorial planning of strategic ecosystems and natural forest management in order to establish the limits of expansion of the agricultural frontier in priority areas for the conservation and sustainability of ecosystems. These include biophysical and socioeconomic characterisation of the forest reserves and the development of general guidelines to manage these areas.

Source: FAO (2006); OECD/ECLAC (2014).

Projections show that, by 2050, 80% of crops will likely be affected by climate change in most current areas of cultivation, with particularly severe effects on high-value perennial crops (Table 3.13). Thirty-six per cent of crops will face precipitation changes of more than 3% in at least 60% of the areas in which they are grown. Changing precipitation patterns may alter flowering dates; affect biotic factors (e.g. pests, diseases, weeds) in

Table 3.13. Temperature and precipitations change projections for selected crops by 2050

Selected crop	% of crop area anticipated to have temperature change in the range of		% of crop area anticipated to have precipitation change in the range of		
	2-2.5 °C	2.5-3 °C	-3% to 0%	0% to 3%	3% to 5%
Maize	80.5	19.5	27.7	37.1	35.2
Coffee	84.7	15.3	8.2	28.8	63.1
Rice	64.6	35.4	15.7	23.6	60.7
Non-export plantain	79.8	20.2	7.2	36.1	56.6
Sugar cane	99.6	0.4	1.1	0	98.9
Panela-sugar cane	77.8	22.2	6.1	33.8	60.2
Cassava	70.9	29.1	39.8	41.4	18.9
Fruit trees	72.5	27.5	7.7	22.5	69.8
Potatoes	71.5	28.5	2.6	27.1	70.4
Oil palm	54.8	45.2	54.2	36.3	9.5
Beans	84.6	15.4	10.7	40.4	48.9
Cocoa	40.2	59.8	17.3	53.2	29.5
Cotton	98	2	14.6	55.7	29.7
Sorghum	97	3	33.8	3.8	62.4
Bananas (for export)	100	0	26.9	73.1	0
Vegetables	84.9	15.1	16.1	28.7	55.2
Flowers	100	0	0	16.1	83.9

Source: Lau, Jarvis and Rámirez (2010), CIAT.

different production systems; and change soil water availability. This may be exacerbated on the Pacific coast, where sea level rise may also cause flooding and the salinisation of soils (Lau, Jarvis and Rámirez, 2010).

Pests and diseases have already multiplied, and under changing temperatures and precipitations patterns this situation will likely worsen. Crops currently facing such issues include bananas and plantain in areas above 500 metres above sea level (MASL), coffee in areas above 1 500 MASL, potatoes in areas below 2 500 MASL, as well as cacao, maize, and cassava. Additional chemical treatments can alleviate these effects but impose high economic costs for small farmers and long-term costs to the agro-ecosystem environment (Lau, Jarvis and Rámirez, 2010).

Rising temperatures, degraded lands, falling feed supplies, and limited water supplies will also affect livestock. Attempts to intensify livestock production may inadvertently lead to infectious diseases in livestock, which could then affect farmers and consumers (Lau, Jarvis and Rámirez, 2010).

Summary

- The agricultural sector has traditionally been very important to the Colombian economy, given its contribution to GDP, employment, and exports. While the share of agriculture in GDP has declined from 16.5% in 1990 to 5.8% in 2012, it remains a key sector in terms of employment, although this too has decreased from a 26% share in 1990 to 17.5% in 2012.
- Growth rates in the value of agricultural production have been relatively low since 1990.
- Agricultural labour productivity has been improving, but the pace of growth has slowed since the mid-2000s. Agricultural productivity remains at low levels compared to other countries within the region.

- The relative importance of the livestock sector has increased while that of crop production has declined: growth in the livestock production has averaged 3%, whereas growth in crop production has averaged 0.5% during the period 1990-2012. As a result, the livestock subsector represented 46.2% of the agricultural sector in 2012, from 35.3% in 1991.
- Small farms dominate food crop production: a large number of smallholders produce mostly for their own consumption, while a smaller number of large-scale commercial farms account for a higher share of output.
- There is a need to better understand farm structures and ownership across different regions. There is a lack of clear harmonised criteria across institutions to frame the concepts of small, medium and large farms and that can provide the proper basis for agricultural policy design and implementation.
- The agricultural sector continues to be characterised by high levels of poverty, income inequality, and land concentration. Almost one-half (47%) of the rural population lived below the national poverty line in 2012, compared to 28.4% of the urban population.
- There are land use conflicts due to inconsistencies between current usage and actual suitability of agricultural land. There is a need for appropriate land assessments across departments and production centres. Land irrigation and drainage infrastructure is insufficient.
- The sector is characterised by a highly unequal structure of land distribution. More than 40% of land ownership continues to be informal.
- Illicit crop production and armed conflict have affected the evolution and growth of agricultural output.
- Integration with international markets remains very low, both for exports and for imports. Agricultural exports currently represent approximately 11% of total Colombian exports. The structure of agro-food exports has not been sufficiently diversified, but there is great potential to be exploited if bottlenecks to competitiveness in international markets are tackled. Agricultural imports have been increasing in recent years.
- Food consumption patterns are improving. However, challenges remain in the area of child nutrition and the adoption of healthier dietary patterns in various regions.
- The agricultural sector places considerable pressure on the environment.
- The challenges faced by the Colombian agricultural sector are structural in nature. The poor use of farmland, rising costs of transport and inputs, and low use of technology reduce overall production efficiency and negatively affect competitiveness. There is a need to focus on fostering a solid enabling environment to support sustainable agricultural development.

Notes

1. The cadastre was constructed as a public register showing the details of ownership and value of land. It was created for the purpose of taxation. Reforms of the cadastre aim to describe parcels as well as their characteristics and relation with the people and the area in which they are located.
2. Article 38 of Law 160 of 1994 defines the UAF as the “basic unit of crop, livestock, fish or forestry production, the extension of which, taking into account the agro-ecological conditions of the geographic area and the adequate technology, allows its occupying household to remunerate its labour and dispose of a profit that can develop its capital”. The UAF is the area of land which, for given agro-ecological conditions, can generate income for a family. It was calculated that the necessary revenue for such an outcome is equivalent to two minimum salaries according to the current legal framework.

3. According to the available official statistics, there is no clear trend in the absolute number of agricultural workers. The comparability of time series across the last two decades remains poor, because of the change in methodology of household surveys collecting information on employment.
4. Non-salaried workers include employers, self-employed workers, and non-remunerated workers.
5. The Index of Multidimensional Poverty has been jointly developed by DANE and the University of Oxford.

ANNEX 3.A1

Land ownership and land access efforts in Colombia

The Colombian Civil Code governs property types and means of acquisition, including occupation, transfer, succession and adverse possession. Other laws and decrees of importance include: Decree 1250 (1970), which established the current registration system; Law 66 (1968), which governs urban development and housing and regulates purchase and sale contracts, as well as the expropriation of property by the state; and Law 388 on Territorial Development (1997), the country's national planning law (UN-Habitat, 2005; USAID, 2010).

Land, other than communal, can be held or acquired through: private ownership (freehold, unconditional, indefinite); possession without legal registration; invasion, if the invader is not promptly evicted from the property; simple tenure; user loans; rent; usufruct; house leasing; transit lots and temporary settlements (for internally displaced population); assignment contract or provisional tenure; and joint ventures between private entities and the state (UN-Habitat, 2005; USAID, 2010).

The structure of land distribution in Colombia has its roots in the colonial age, when land was assigned according to the Spanish principle of “dwell and work” (*morada y trabajo*), which assigned land rights to the person who dwelled and worked on a specific plot. In later years, the appropriation of frontier lands was permitted upon payment of a fixed sum to ensure a valid title, with the possibility of proving dwell and work later. These regulations allowed the best land in the valleys and high plains to be appropriated in the 16th century, either through valid property titles or through informal tenancies (Ibañez and Munoz, 2010). As the agriculture frontier expanded, this system resulted in territorial entrepreneurs, settlers (*colonos*), farmers, sharecroppers (*aparceros*) and tenants having unequal access to land. This resulted into a very unequal agrarian structure.

Law 200 of 1936

The causes of land conflicts of the late twenties and thirties were based on the attempt of settlers, indigenous and tenants to be released from the relationships of submission they had on large properties as workers. They wanted to become independent producers with ownership titles and better access to land. In overall terms, conflicts derived from the unresolved problems around vacant lots *baldíos* (i.e. delimitation of private property and the state property), property division policies (*política de parcelaciones*), conflicts between tenants and settlers, the settlement policy (*política de colonización*) and working conditions within the big *haciendas*. Law 200 of 1936 aimed to clarify property titles, to introduce stricter regulations with respect to the eviction of sharecroppers, to encourage the

productive exploitation of land (with a threat of expropriation), and to undertake a programme of land reform. During this period, important provisions were established, such as having specialised judges to resolve land issues, the principle that land had a social function, and the right of holders of privately owned land to claim property rights after five years of working the land. The reform threatened large land owners who were prompted to evict sharecroppers before the five year period. Despite the good intentions of Law 200, its deficient design created incentives opposite to what was originally intended. Sharecroppers initiated legal actions to nullify the titles of large landowners, while the landowners, fearing the loss of their lands, stepped up the massive eviction of sharecroppers. This increased land colonisation of the agricultural frontier, since many evicted peasants had to find a new place to settle. This was an incentive for many large landowners, who had formerly made intensive use of manpower, to switch to intensive capital investments, and to enlarge cattle stock at the expense of crop production. Large landowners also took advantage of the law to legalise large stretches of land (Ibañez and Munoz, 2010).

Law 100 of 1944

Law 100 of 1944 modified the previous land reform law and re-established sharecropping contracts. This denied the peasants' rights to claim the land that they had been tilling. In addition, it increased the number of years that landowners had to modify their land use to avoid expropriation from 10 to 15. This highlights how, overall, the agrarian reform proposed in the 1940s was heavily influenced by the large landowners (*terratenientes*) (Albán, 2011).

Law 135 of 1961

Law 135 of 1961 created the Colombian Institute of Agrarian Reform (INCORA) as the entity responsible for implementing the land reform policy. It aimed at carrying out an ambitious land reform programme through three actions: distribute land to landless peasants and re-establish viable holdings in areas where small landholdings predominated; incorporate new agricultural land as a factor of production and promote effective economic exploitation of uncultivated land areas; lastly, provide basic social services and other complementary support to improve the living standard of small tenant farmers and sharecroppers. However, the law never translated into a real redistribution of land. First, the expropriated land areas were in remote regions and with poor soil quality. Second, the amount of expropriated land was far below the established targets. In 1971 INCORA suspended all land redistribution activities and the land that had been previously acquired remained undistributed. By 1972, 123 000 titles had been granted, far short of the 935 000 families that had been identified as eligible, and only 1.5% of all large landholdings had been redistributed. Moreover, the INCORA geared the land reform efforts towards granting titles to frontier lands, a less controversial initiative than expropriation (Ibañez and Munoz, 2010).

Law 4 of 1973 and Law 6 of 1975

Law 4 of 1973 reflects the *Chicoral* agreement between the Government and farmers. It introduced procedures for the classification of properties and listed the possibilities of attribution and expropriation. It required determining minimal productivity by crop and by region and thus favoured productive efficiency, slowing the process of land expropriation

and redistribution. Law 5 of 1973 established a financing system for agriculture through the Agricultural Financial Fund. Credit to farmers was oriented to technical assistance and credit lines were defined for agricultural businesses and landowners. Law 6 of 1975 focused on the terms of lease of land. Sharecropping contracts were regulated to neutralise the attempts of workers to request ownership rights. It is argued that this re-established weak tenure systems.

Law 35 of 1982

The policy of peace promoted by the Government and negotiations with insurgent groups was established under Law 35 of 1982, also known as the Amnesty Law. The law facilitated the acquisition of land in areas affected by conflict through a simplification of paperwork.

The 1974-78 Government also initiated the Integrated Rural Development programme (*Desarrollo Rural Integral, DRI*) that was part of the Food and Nutrition National Plan. The DRI was intended to improve the critical living conditions of the poorest and rectify the failures of previous land distribution programmes. It meant to provide small food producers with subsidies, technical assistance, improved infrastructure, credit, and education. However, the poor programme outcomes and resource depletion aggravated the food production crisis (Albán, 2011).

Law 30 of 1988

Law 30 of 1988 broadly settled the following guidelines: achieve co-ordinated actions of government institutions, raise the living standard of rural population, simplify the procedures for the acquisition and allocation of land by peasants, eliminate the grade/classification system of the land, and provide more resources to INCORA to develop productive projects. Law 30 established that all rural properties were susceptible to acquisition by direct negotiation and expropriation for land reform. This overcame the obstacle of qualifying land based on minimum levels of productivity. The purpose was to facilitate acquisition and expropriation that was meant to ease the redistributive process. There was an increase in allocation of vacant lots, there was greater attention to indigenous communities through the expansion and establishment of reserve zones and there was an increasing support for colonisation in areas already occupied through the implementation of road infrastructure. It was argued however that the results achieved were still very limited considering the large percentage of peasant families that ought to have benefited (Mora Cortes, 2007).

Law 160 of 1994

During the 1980s-90s period of intense violence, illegal armed groups began to take brutal control of rural properties and displaced farmers in order to establish strategic territories. Economic liberalisation and neoliberal policies introduced at the beginning of the '90s decade played as an inflection factor in the process of redistribution of land that was being implemented within the framework of Law 30 of 1988. The decision taken was to replace the process of redistribution of property in order to allow the market forces to guide the demand and supply of land. In 1994, the Colombian government designed a new land distribution programme with the passing of Law 160. In contrast with the previous land distribution programmes, this was based on market mechanisms for the transfer of land, not on the expropriation of unproductive lands. Peasants who were eligible as beneficiaries

had to identify the plot of land, negotiate the purchase with the owner, and inform the INCODER (the Colombian Institute of Rural Development, which was created to replace the INCORA) in order to proceed with the transaction. The Colombian government offered a 70% subsidy for the purchase.

The goal of this reform was to redistribute 1 million ha, but only 598 332 were ultimately delivered. In addition, actions were focused only in four departments and half of the plots allocated were located in only 40 municipalities, whereas Colombia has 1 123 municipalities. During the period 2002-07, INCODER's actions focused mostly on vacant land titling, while only 5.6% were granted as part of the component of land access (Ibanez and Munoz, 2011). The law established that all tenant farmer areas become *Zonas de Reservas Campesinas* if they have not previously been declared for business development. This dimension also sought to transform beneficiaries into medium-size entrepreneurs as well as to engage farmers in planning and decision-making bodies. Only five *Zonas de Reservas Campesinas* were formerly created in the country; however, these were abolished in 2003. Law 160 of 1994 remains the current legal framework that determines the design and implementation of policies regarding land distribution.

The Government passed a series of laws with the goal of protecting displaced persons and aiding restitution and resettlement efforts. Law 387 of 1997 seeks to prevent displacement by violence, and charges responsible institutions with the protection of abandoned land. A supplementary decree of 2001 requires these institutions to identify owners, tenants and occupiers from areas of displacement or threatened displacement. Decree 250 of 2005 calls for the titling of communal land held by indigenous groups and Afro-Colombian communities. Such laws and decrees have not been well implemented, and it is estimated that only one third of the displaced population received assistance through this law (Elhawary, 2007; USAID, 2010).

Land distribution is currently at the heart of peace talks between the Government and the FARC guerrilla. After nearly a year of talks in Havana, the two sides have agreed on a tentative deal concerning land distribution that set the basis for an agenda denominated as "Towards a new Colombian rural area: Rural Comprehensive Reform".

Rights of victims and land restitution (Law 1448 of 2011)

As of mid-2010, the National Planning Department (DNP) is co-ordinating a comprehensive restructuring of land policy, which includes, among other items, the formalisation of property rights and the restitution and protection of internally displaced people's lands (URT, 2013).

The Colombian Government recently designed the legal framework and instruments for restituting land rights to those who were disposed as a cause of the long-standing internal conflict. Although the policy was initially and accurately framed as an effort to redress Human Rights violations and infringements to International Humanitarian Law, it was later included as a strategy component within the much broader National Policy for Rural Development, and as such it holds important potential for correcting deficiencies within the Land Administration System and for improving sustainable land use (Pardo and Victornino, 2013).

The 2011 Victims and Land Restitution Law (*Ley de Víctimas y de Restitución de Tierra*, Law 1448, June 2011) is a cornerstone in this regard. This constitutes the first piece of legislation enacted to redress the suffering caused to millions of victims and internally

displaced persons by the country's internal conflict. It is the first to legally acknowledge the existence of an armed conflict and provides the mechanisms for facilitating the restitution of millions of hectares of land abandoned or illegally acquired during the conflict. Victims whose land was misappropriated or illegally occupied after 1991 will be eligible for land restitution, while victims suffering abuses during 1985-91 will only be eligible for financial compensation. The Unit of Land Restitution (URT), the entity leading this process, also has a programme of financial aid that will support production projects for families returning to their land (URT, 2013).

The Law targets the restitution of 2 million ha of land over a ten-year period. However, this is a much lower number than the estimates for total abandoned and illegally occupied land from other government departments, international and civil society, which place the figure between 4 and 6.8 million ha (excluding collectively held territories). Up to July 2013, there have been 43 590 requests of land restitution. Micro and small landholdings together with medium landholdings represent so far the largest share of the type of areas claimed. The highest number of hectares claimed is in the Oriental region, particularly in the department of Meta. The Law makes restitution claims dependent on claimants being able to provide solid information including exact registration details. However, many forcibly displaced people do not have or lost this information. Moreover, there is a need to reduce the time to resolve a land claim (current average is estimated at one year), to ensure enforced security in the concerned area once the claimant is able to return on restated land, as well as to strengthen longer-term economic support through special credit lines and technical assistance (URT, 2013).

ANNEX 3.A2

Sources of rural level data

There is a need for reliable data sources in rural areas across Colombia's regions and departments in order to make well-informed policy decisions. Colombia is currently conducting an agricultural census, the third in its history. The previous census took place in 1970. This long time lag between the last two censuses highlights the deficit of accurate and timely rural level information for the last decades.

Rural-level information has been collected through household surveys conducted across different departments. Over the last two decades, DANE has been implementing such surveys, while improving both geographic coverage and methodology. The National Household Survey (*Encuesta Nacional de Hogares*) has been conducted over 1990-98 when it transformed into the Continuous Household Survey (*Encuesta Continua de Hogares*). The latter was also converted into the Extensive Household Survey (*Gran Encuesta Integrada de Hogares*). Information on income and expenditures has been collected for the rural area through the 2007 Incomes and Expenditures Survey (*Encuesta de Ingresos y Gastos*). The implementation of such surveys has allowed mapping out characteristics of rural households at different points in time, but the frequent changes in methodology burden comparability of results over time.

Agricultural-specific information is currently collected through the National Agricultural Survey (*Encuesta Nacional Agropecuaria*, ENA), the Municipality Agricultural Evaluations (*Evaluaciones Agropecuarias Municipales*, EVA) and product-specific censuses. The ENA was first conducted in 1988. Between 1995 and 2005, DANE and MADR implemented 10 ENAs. In 2005-09, MADR was main entity responsible for conducting ENA, and in 2010 an agreement was signed between DANE, MADR and Corporación Colombia Internacional (CCI) for jointly developing the ENA. As of 2011, DANE became the entity responsible for ENA. ENA currently covers 38 million ha of agricultural land across 22 departments. The most recent ENA data are currently undergoing an anonymisation process within DANE. In 2011-12, MADR and CCI have also been implementing the *Encuesta de Decisión de Siembra y Productividad* with the objective of providing accurate information for each semester on the harvested area, production and yields, but also on technological endowment, climate, crop practices, access to inputs and other factors that impact agricultural production for 30 crops across representative areas called "production centres" (*núcleos productivos*).

Other product-specific information has been collected through censuses focused on individual crops, such as rice, palm oil, potato, wheat, soybeans, or onions. These have been conducted more frequently and data is available for more recent years, with the

objective of understanding the dynamics of the respective sectors. However, some are only available for a specific production area or department. They have been mainly conducted by producer associations, sometimes in joint collaboration with DANE and MADR. There is also a Livestock Survey (*Encuesta de Sacrificio de Ganado*, ESAG) conducted by Fedegan.

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PART II

Agricultural policy trends and evaluation in Colombia

PART II

Chapter 4

Agricultural policy framework in Colombia

This chapter examines the agricultural policy framework in Colombia since 1990. It first looks at the main priorities of agricultural and rural development policy concern over the past 20 years. The chapter then provides a description of the sector's institutional arrangements at central and local levels, as well as of the capacity and reach of entities that are affiliated and linked to the Ministry of Agriculture and Rural Development (MADR). The chapter looks at the roles that MADR and its related entities, as well as other Ministries, have in developing and implementing policy instruments to achieve stated objectives. It also presents the main producer associations in Colombia and their interaction with the governmental entities. The institutional framework for designing and implementing agricultural policies appears rather complex which increments the risk of overlapping activities particularly in the context of limited co-ordination between entities.

Legal framework for policy implementation

According to the 1991 Constitution, it is the responsibility of the state to: i) promote progressive access to land for agricultural workers, provide basic public goods (e.g. education, health, housing, and social security) and improve income and quality of life; ii) support agro-food production and therefore crop cultivation, livestock farming, fisheries, forestry and agribusiness by providing physical infrastructure, ensuring land suitability, and promoting research and technology transfer; and iii) provide credit in relation to crop cycles and market circumstances (e.g. prices and environmental risks).

Law 101 of 1993, known as the General Law for the Development of Agriculture and Fisheries, provides the legal framework and medium-term strategies to increase the competitiveness of the agricultural sector (Table 4.1). The National Development Plan (PND) provides a further framework for defining specific agriculture policies and allocating budgets to achieve them. Territorial entities then adopt more localised plans in accordance with the PND. The National Council of Economic and Social Policy (CONPES) initiatives also constitute key tools for policy design. These initiatives set specific objectives for particular sub-sectors or policy areas. They are developed by the Department of National Planning (DNP) in co-ordination with the Ministry or public entities responsible for implementing programmes in the sector under discussion. The PND and CONPES¹ policy documents play an instrumental role in shaping agricultural policies.

Table 4.1. **General Law for the Development of Agriculture and Fisheries: Law 101**

Chapter 1	Internationalisation and protection of the agriculture and fisheries sector
Chapter 2	Priority to rural development
Chapter 3	Access to credit for the agriculture sector
Chapter 4	Incentive to rural capitalisation
Chapter 5	Parafiscal contributions to the agriculture sector
Chapter 6	Price stabilisation funds for the agriculture sector
Chapter 7	Support to agro-food marketing structures
Chapter 8	Technology modernisation and transfer, technical assistance, agro-food sanitary and phytosanitary dispositions
Chapter 9	Social investment in the rural sector
Chapter 10	Family allowances to peasant households
Chapter 11	Agricultural insurance
Chapter 12	Mechanisms of citizen participation in the design of agricultural policy
Chapter 13	Congress supervision over agricultural policy
Chapter 14	Supply chain organisation in the agro-food sector
Chapter 15	The transformation of the rural social context
Chapter 16	The management of the Fund for Agricultural Sector Financing (FINAGRO)

Source: MADR (2013a).

Agricultural policy objectives

The current framework (2014-18) for agricultural policy design is being shaped by the Mission for the Transformation of the Countryside initiative (*Misión para la Transformación del Campo*), the PND, and the peace negotiations between the Colombian government and the FARC guerrillas.

The **Mission for the Transformation of the Countryside** is an ambitious plan defined in 2012 that looks at five main components: 1) the role of rural areas in the overall development of the country; 2) an inclusive rural development process for narrowing social gaps; 3) the provision of public goods in rural areas; 4) sustainable and competitive agricultural development; and 5) a modern and efficient institutional framework.

The **PND** 2010-14 recognises that growth in the agriculture sector has lagged behind other sectors and highlights six main bottlenecks to the sector's competitiveness: low productivity; limited availability of infrastructure for the transportation and marketing of agricultural products; limitations to the expansion and diversification of markets; a low capacity to meet exogenous factors and stabilise investments in the rural area; the difficulty of rural population in developing their productive potential; and regional imbalances. Increasing competitiveness is identified as key to boosting the sector's growth and development (Table 4.2).

Table 4.2. Agriculture in the 2010-14 PND

National Development Plan "Prosperity for All" (2010-14): Agriculture as a key engine of growth	
Bottlenecks	Strategies
1. Low competitiveness and productivity	1. Increase the competitiveness of agricultural production
2. Limited infrastructure for the transportation and marketing of agricultural products	2. Promote supply chains and value addition in agricultural production, forestry and fishing
3. Limitations to expanding and diversifying markets	3. Expand and diversify the domestic and foreign markets with better-quality products
4. Low capacity to respond to exogenous factors and stabilise investments in the rural area	4. Promote risk management schemes and improve conditions for investment in the rural area
5. Difficulty for the rural population to develop their productive potential	5. Improve the ability to generate rural population income
6. Regional imbalances	6. Promoting equity for the rural regional development
	7. Adequacy of the institutional framework for rural development and competitiveness

Source: Authors' compilation based on PND 2010-14.

Components of the peace negotiations² that have influenced the design of agricultural policies recently in Colombia are:

- Rural development: Access and use of land resources, land development programmes, infrastructure and land adaptation, social development, incentives for agricultural development and food policy.
- Political participation: Rights and guarantees to exercise political opposition, democratic mechanisms for citizen participation, and effective ways to promote greater political participation at the national, regional and local levels.
- Drug trafficking: Substitution programmes for illicit crops areas, prevention programmes against the consumption of illicit substances and parallel public health programmes, solutions to drug production and trafficking.

- Ending the armed conflict: Ceasefire, the re-incorporation of the FARC into civil, socio-economic and political life, and security guarantees.
- Reparations for victims of the conflict: Recognition of abuses suffered during the conflict and of victims' rights (GOC and FARC communiqué, 2013; OECD, 2013; EIU, 2014).

In 2013, the Colombian government and FARC representatives reached a preliminary agreement with regard to "rural development". This agreement set the basis for the agenda "Towards a new Colombian rural area: Rural Comprehensive Reform" (*Reforma Rural Integrada*, RRI). In mid-2014, the parties reached an agreement on drug trafficking, and they hope to reach a comprehensive peace deal in 2015. Representatives of both sides agreed on strategies concerning the following points:

- Access to and use of land: This foresees the creation of a Land Fund to regulate property rights and promote an equitable distribution of agricultural land. It will be composed mainly of land that has been improperly and unlawfully acquired, and will recuperate suitable vacant land and land occupied in contravention of current legislation. There will be an extensive process of formalisation of small and medium landholdings. To ensure the effective protection of property rights, an agrarian jurisdiction will be created with regional coverage and capacities. It was agreed to strengthen the mechanisms that ensure a quick and timely access to justice in land matters, especially for smallholders. Traditional mechanisms to solve conflicts, pertaining to rural communities, will also be enforced. The rural cadastre will be updated by regional authorities with the participation of communities. This will be complemented by a system to collect property taxes. Land will be classified according to its suitability and the appropriate production system. The agricultural frontier will be separated from conservation zones. The development of Peasant Reserve Zones should ensure the involvement of local communities in the process.
- Development of programmes with a territorial approach.
- Infrastructure and soil improvement: Infrastructure programmes that focus on reconstructing the tertiary road network will be developed; closing the gap in electrification and telecommunications in rural areas, and improving the quality of energy and Internet services in rural areas; and improving irrigation and drainage systems.
- Social development (health, education, housing, poverty eradication): This calls for the development of sectoral programmes to reduce poverty and inequality, and improve rural health and education systems, broaden their coverage, inclusion, and quality, as well as promoting relevant technical education that meets the needs of the productive sector.
- Stimulating agricultural production and economic solidarity and co-operatives (support, subsidies, credits, income generation, marketing channels, labour formalisation): The agreement recognises that access to land is a necessary but not sufficient condition to ensure the welfare of the rural population and the development of efficient production. It therefore calls for increased access to inputs, irrigation systems, technical assistance, and credit. Seed banks would be created in order to ensure access to optimal planting material. Suitable marketing conditions would promote market integration and farmers' associations will be encouraged. The agreement also mentions developing public procurement mechanisms and institutional programmes to absorb the production of

smallholders. Labour force formalisation will be supported in order to provide social protection to farmers.

- Food and nutrition policies: Food supply will need to respond to departmental and local needs of consumption and nutrition. This will require co-ordination with communities and local authorities. Additionally, national and local councils will be constituted in order to represent all stakeholders and define the guidelines to be implemented in this respect.

The Agrarian Pact (*Pacto Agrario*) was established in the second half of 2013 following a wave of country-wide protests by farmers in response to perceived inequities created by Colombia's pursuit of trade agreements (Box 4.1).

Box 4.1. **Agrarian Pact**

The Pact calls for a bottom-up process to reshape agricultural and rural development policy. The Pact is an acknowledgement by the government of the need to shift its general vision and address co-ordination problems between central government and territorial authorities.

Thus, the Pact calls for the participation of the 1 102 Municipal Councils of Rural Development (CMDR) and 32 departmental Councils for Agricultural Development (CONSEA), and the five Regional Councils, along with representatives from the private sector, civil society, and academia in setting government policy based on four key pillars: land and water use, agricultural production components, the provision of socio-economic infrastructure and public goods, and the institutional framework (Table 4.3). The Pact is at the stage of developing a common vision around these key issues, and has yet to set out clear policy actions associated with each pillar.

Table 4.3. Agrarian Pact's pillars

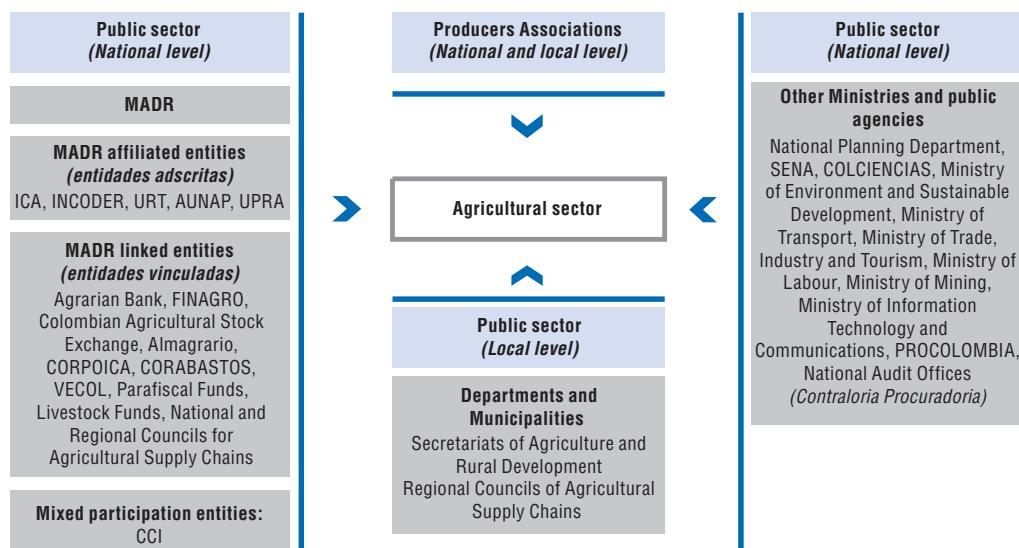
Land and water use
Sustainable use of land and water as factors of production
Local land-use planning
Land rights, access to land, formalisation and restitution
Agricultural production
Innovation, science and technology
Farmers association and entrepreneurship
Technical assistance
Risk management
Commercialisation, storage and marketing systems
Socio-economic infrastructure and public goods
Transport infrastructure
Energy
Health and education
Labour formalisation and pension system
Rural housing and public services
Institutional framework
Central government-local authorities co-ordination
Budget allocation and spending at central and local authorities levels

Source: MADR (2014).

Institutional arrangements for administering agricultural policy

Public and private actors work together to design and implement policies and programmes for the agricultural sector (Figure 4.1). The public sector is represented first and foremost by the Ministry of Agriculture and Rural Development (MADR) and its affiliated and linked entities. At the local level, MADR is represented through the Secretariats of Agriculture and Rural Development and Regional Councils of Agricultural Supply Chains. Private actors are mainly represented by agricultural producer associations at both the national and local levels. A large number of other ministries and public agencies are also involved, directly or indirectly, in the design and implementation of agricultural policy. These include programmes related to the environment and use of natural resources, as well as the provision of public goods such as infrastructure and energy, research, or agricultural training. A key challenge is to ensure adequate and effective co-ordination between MADR and these other public authorities (see Annex 4.A1 for more details on the responsibilities of other ministries and public agencies in the agricultural sector).

Figure 4.1. General institutional framework for administering agricultural policy

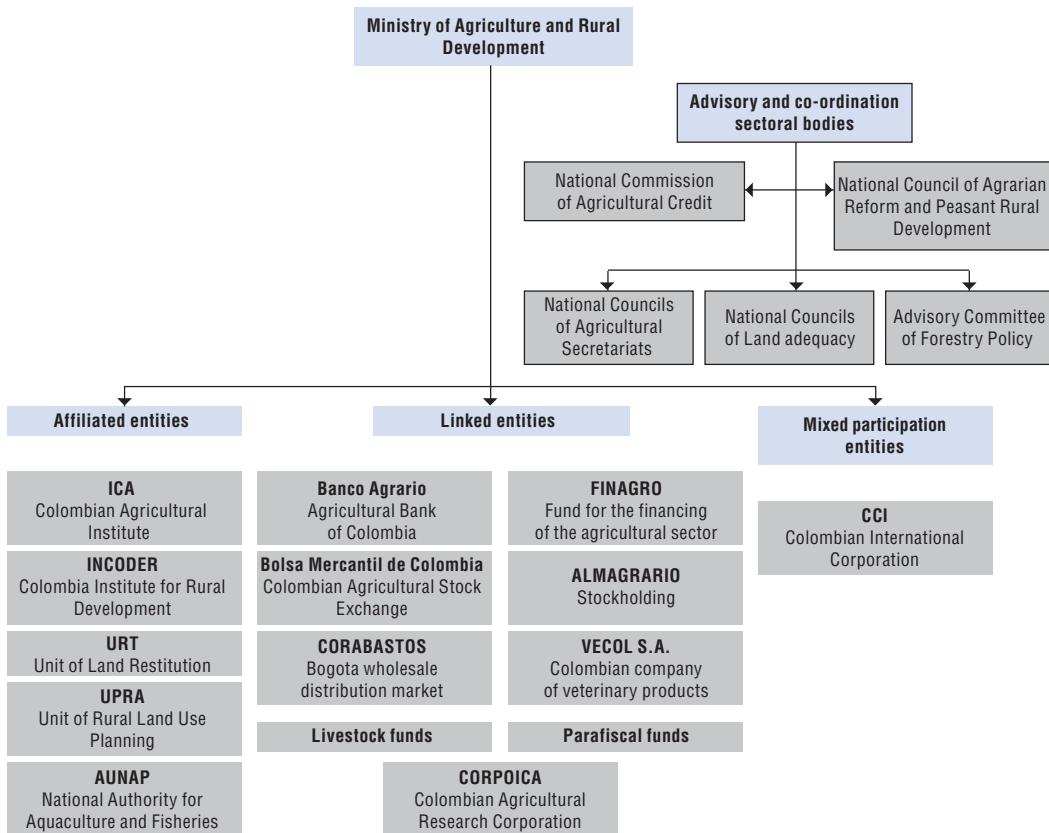


Source: Based on information provided by MADR (2013f).

MADR has five sectoral bodies of advisory and co-ordination and a number of related entities to contribute to policy design and implementation in specific sub-sectors. 1) The National Commission of Agricultural Credit is a governing advisory body that sets the basis of the credit policy for the sector. 2) The Council for Agrarian Reform and Peasant Rural Development which provides advice in the planning and policy formulation on land issues. 3) The Advisory Committee of Forestry Policy that co-ordinates the implementation of policies related to the forestry sector. 4) The National Council for Land Adequacy that oversees the development of irrigation and drainage infrastructure. 5) The National Councils of Agriculture Secretariats (CONSA) that implement and co-ordinate agricultural policies at the local level (Figure 4.2).

There are five **affiliated entities** (*entidades adscritas*) to MADR: the Colombian Agricultural Institute (ICA), the Colombian Institute for Rural Development (INCODER), the Special Administrative Unit for Managing Restitution of Forcibly Stripped Land (URT), the

Figure 4.2. MADR and its related entities



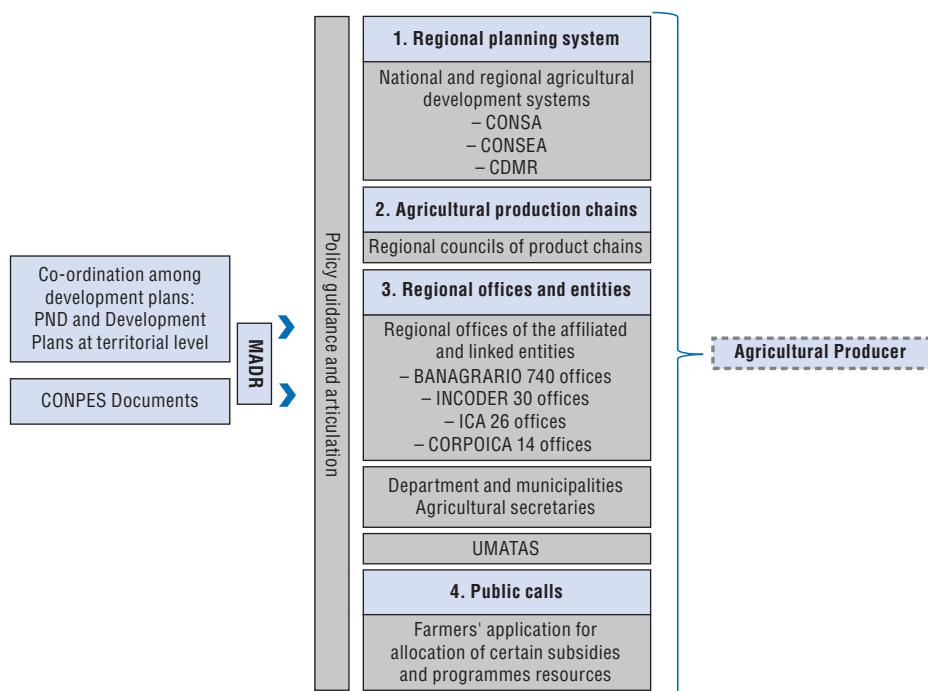
Source: MADR (2013f).

Unit for Land Use Planning (UPRA), and the National Authority for Fisheries and Aquaculture (AUNAP). They work on policy design and implementation in key areas, such as: research, technology transfer and the prevention of agriculture health risks (led by ICA); the implementation of rural development policies (led by INCODER); the implementation of policies related to land restitution to the victims of conflict (led by URT); the development of guidelines for the efficient use of agricultural land (led by UPRA); and policies in the area of fisheries and aquaculture (led by AUNAP).

There are nine **linked entities** (*entidades vinculadas*) to MADR: the Agrarian Bank, the Fund for Agricultural Sector Financing (FINAGRO), the Colombian Agricultural Stock Exchange (BMC), Bogota Wholesale Distribution Market (CORABASTOS), Storage Company (ALMAGRARIO), Veterinary Products Company (VECOL), the Parafiscal Funds, Livestock Funds and Colombian Corporation of Agricultural Research (CORPOICA). They have the responsibility of guiding and implementing policies on topics such as funding of productive activities related to the sector, other financial services, storage, product distribution, and R&D. Linked entities have more autonomy with respect to MADR than affiliated entities in terms of resources allocated and objectives (see Annex 4.A1 for more details on the role of affiliated and linked entities).

In addition to central government representation, the National Councils of Agriculture Secretariats (CONSA) are present at the local level and generate recommendations for the design and implementation of agricultural policy. CONSEA (Sectoral Council of Agricultural Development) represents the Councils at the level of departments. Lastly, the Regional Council of Municipal Rural Development (CDMR) represents the Councils at the municipal level. MADR is represented at the local level by regional councils for agricultural supply chains (*Consejos Nacionales y Regionales de Cadenas Productivas*) that try to link primary production to the agro-food industry and provide support for the marketing of agriculture products. Technical assistance service delivered through the Municipal Units for Agricultural Technical Assistance (*Unidades Municipales de Asistencia Técnica Agropecuaria*, UMATAs) is an important channel for interaction with agricultural producers. They were created by Law 101 of 1993 for the provision of technical assistance services. However, several assessments of their activities point to the inefficiencies of their operations due to corruption, insufficient budget and territorial coverage (Contraloría, 2002). Agricultural programmes are implemented through public calls (*convocatorias públicas*). These auctions are usually administered by the entities associated to MADR or private operators. Outside the public sector system, agricultural producer associations represented at the national and territorial levels, as well as universities and academic research centres, play a key role (Figure 4.3).

Figure 4.3. Mechanism for reaching agricultural producers



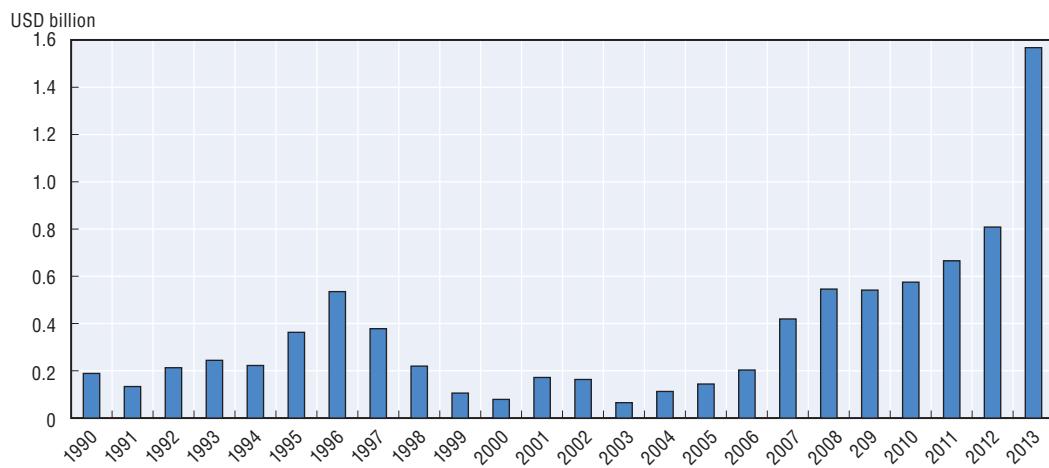
Source: MADR (2013f).

At present, MADR functions are split between the two major themes of rural development and agricultural policy, each overseen by a Vice Minister. These two areas have traditionally been divided in terms of policy approaches, resulting in less effective policy outcomes in both areas. MADR also has a role in defining the government's general macroeconomic and social objectives and policies, as well as in the development of the PND

regarding the rural sector. It is also responsible for projects directed at rural housing (MADR, 2014; DAFP, 2010) (see Annex 4.A1 for more details on the internal structure of MADR).

MADR's budget is approved yearly by Congress and the major source of its financial resources are taxpayer funds. The outlays allocated to the agricultural sector, without considering administrative expenses, by MADR and its related agencies were USD 1.5 billion in 2013 (Figure 4.4).

Figure 4.4. Evolution of MADR and its agencies budget



Note: This budget does not include administrative expenses.

Source: DNP (2014), *Budgetary Allocations Database 1990-2013*, Information provided for the OECD Review of Agricultural Policies.

StatLink <http://dx.doi.org/10.1787/888933181764>

An additional important source of financial resources is represented by the General System of Royalties (*Sistema General de Regalías*), formerly the National Royalties Fund. The current General System of Royalties allocates royalties across six main areas, of which the Regional Compensation Fund and the Regional Development Fund, along with direct allocations to producing regions, receive 50% of the disbursements. The main purpose of the two funds is to improve regional productivity, with most of the resources to be spent on infrastructure projects (OECD, 2013).

Agricultural producer associations (*gremios*) are important actors in the Colombian agricultural sector and represent the interests of agricultural producers. Colombia has a long tradition of agricultural producer association organisations that have worked to facilitate the public-private dialogue and co-operation. These associations play a significant role in the delivery of specific general services, such as technology transfer, research, technical assistance, or marketing. In addition, several of them administrate parafiscal funds associated with their corresponding sub-sector, some of which were created in order to finance such services. The associations cover the main commodities that Colombia produces, exports, and imports. They have a wide and relatively well consolidated structure at the territorial level. Furthermore, several producers associations implement government programmes.

Producer associations are also strongly related to the development of “supply chains” (*cadenas productivas*). Their responsibilities with respect to the product supply chain can

vary according to the commodity covered. As specified above, the institutional framework supporting supply chains seeks to promote strategic alliances, reduce transaction costs, foster competitiveness at all stages of the value chain, and strengthen the role of the producer. This requires the involvement of associations.

The Colombian Farmers Society (*Sociedad de Agricultores de Colombia, SAC*) is considered to be the main agricultural association at the country-wide level. It was created in 1871 and is one of the oldest agricultural producer associations in Colombia. SAC provides overall representation for various key commodities as it has approximately 48 affiliates that are mainly commodity-specific agricultural producer associations. SAC provides assessments of the overall sector and of specific policies, but also provides a common position on behalf of producers in trade agreements negotiations (SAC, 2013).

Box 4.2 describes the main associations covering key commodities within Colombia's agricultural sector. The associations are generally responsible for providing a unified position within national sector policy debates and in relation to the government. Some are also responsible for providing key general services, such as research and technical transfer, provisions of inputs or credit. In general, all associations set out long-term objectives for the development of their respective sector. However, there appears to be a wide heterogeneity in terms of representation at the territorial level.

The agro-food industry is represented within the National Business Association of Colombia (ANDI). Specialised Chambers bring together companies across various segments: poultry, pig farming, cattle, feed industry, or aquaculture. The mission of the Chambers is focused on providing economic assessments of the sectors, as well as fostering and strengthening the competitiveness of its affiliates (ANDI, 2013).

Box 4.2. Main producer associations for Colombia's key agricultural commodities

The **National Rice Federation (FEDEARROZ)** is the main association representing rice producers. The association has a national reach and provides key services to rice producers such as research and knowledge transfers, and the provision of inputs and credit. It is part of the board of the National Rice Fund. The National Federation of Industries of Rice (INDUARROZ) represents 90% of the milling industry and is affiliated with ANDI.

The **Federation of Potato Producers (FEDEPAPA)** is the main association representing potato producers. It provides technical support services and oversees the improvement of producers' social context. The Federation has approximately 26 000 members.

The **National Federation of Cereals Producers (FENALCE)** initially represented only producers of wheat and barley working in cold climate. Over time, it was expanded to integrate the warm weather cereal producers, and later integrated the grain legumes (beans, pulses and oilseeds) producers, making it one of the biggest agricultural associations. Currently, crops such as wheat, corn, sorghum, oats, barley, peas, beans, chickpeas, lentils and soybeans benefit from FENALCE's projects and programmes for improving competitiveness. The cereals sector also counts on the resources of a parafiscal fund, supported through the Cereal Development Fee. The feed industry benefits from representation from a special division within the ANDI, which brings together the leading companies producing animal feed.

Box 4.2. Main producer associations for Colombia's key agricultural commodities (cont.)

The **National Federation of Coffee Producers of Colombia (FEDECAFE)** represents coffee producers and is one of the main associations in Colombia. Its main objective is to provide policy guidance to producers, as well as to organise, regulate and promote the Colombian coffee sector. The main task of the Federation is to guarantee an effective representation and defend the interests of Colombian producers at the national and international levels. The Federation also leads advertising and promotional campaigns for Colombian coffee at the national and international levels. The Federation has also been a major executer of governmental policy (more details in Annex 4.A2).

The plantain supply chain is supported by a **National Council for Plantain** which serves as an advisory body to MADR. It is composed of representatives of the plantain producers associations.

There are several associations for **export banana producers**. The main association is the **Association of Banana Producers of Colombia (AUGURA)**. AUGURA seeks to ensure that exports of bananas can be consolidated as a result of sustainable production processes, as well as the conservation of natural resources and improved incomes for producers. The Banana National Council has established four pillars of action: infrastructure strengthening and access to finance, innovation, research, science and technology, and technical assistance.

Sugar cane producers are represented by the **Producer Association of Sugar Cane (ASOCAÑA)**, the **Colombian Association of Suppliers and Cane Producers (PROCAÑA)**, and the Association of the Risaralda Sugar Mill (AZUCARI). ASOCAÑA represents the sugar industry at the national and international levels. Other specific tasks of the farmer associations include representing the interests of the sugar industry in international negotiations that the government undertakes, the co-ordination of sectoral projects, the preparation of specialised reports related to the sugar industry and provision of consulting to its members regarding economic, market, environmental, information technology, social and legal issues. It also supports the development and implementation of environmental and social policies of the sugar sector and manages the Price Stabilization Fund for Sugar.

The **National Federation of Panela Producers (FEDEPANELA)** seeks to ensure the sustainable development of the panela sector in Colombia.

The most representative association for exporters of flowers and foliage is the **Colombian Association of Flowers Exporters (ASOCOLFLORES)** that handles approximately 75% of the total Colombian flowers exports and brings together more than 240 affiliates located in the savannah of Bogota, in the area of Rio Negro (Antioquia), the Department of Caldas, and Valle del Cauca. ASOCOLFLORES represents and promotes the flower industry in international markets, and supports the overall development of floriculture, mainly in areas of market access, research, transportation, Florverde (seal of socio-environmental certification), and social responsibility programmes with various projects destined to improve the quality of life of workers (see Annex 4.A2 for more details).

Box 4.2. Main producer associations for Colombia's key agricultural commodities (cont.)

The **National Federation of Cocoa (FEDECACAO)** currently represents around 25 000 smallholders across 22 departments. This association is primarily dedicated to research, technology transfer, and commercialisation support. It also administers the National Fund for Cocoa, a parafiscal fund whose resources are collected through the Cocoa Development Fee, meant to finance the set of programmes and projects. The National Cocoa Council's actions focus on four strategic areas: i) production area, ii) research and innovation, iii) market development and iv) institutional framework. A National Cocoa Plan was set up for the period 2012–21 complementing the National Competitiveness Agreement. Various objectives have been set for the sector, such as the modernisation of production across 130 000 hectares by 2016, reaching a yearly production of 156 000 tonnes by 2020, and exporting 50% of domestic production, especially higher value added products.

The **National Federation of Palm Producers (FEDEPALMA)** is the most important association representing palm producers. The Federation undertakes market analyses so that producers can make their own investment decisions based on comprehensive, accurate, timely and sufficient information. A Competitiveness Agreement for the palm oil supply chain was signed in 1998. The CONPES document 3477 of 2007 also established a strategy of competitive development of the palm oil sector. These strategy documents prioritised several areas of production located in the Departments of Meta, Bolívar, Cesar, Magdalena, Santander, Norte de Santander, and Nariño.

Beef producers are mainly represented by the **National Federation of Cattle Farmers (FEDEGAN)**. FEDEGAN administers the parafiscal fund of the sector, which is financed by the Dairy and Livestock Development Fee. It provides services to cattle farmers such as the distribution of inputs and encourages strategic alliances and projects.

Milk producers are represented by FEDEGAN and the **National Association of Milk Producers (ANALAC)**, structured into regional committees across key production areas. There are also associations for specialised breeds and associations that represent various processing areas or co-operatives. Stakeholders located within the processing stage of the supply chain are represented by the ANDI, the Association of Milk Manufacturers (ASOLECHE) and the Association of Independent Processors that brings together small and medium-sized industries.

The **Colombian Association of Pig Farmers (ASOPORCULTORES)** provides access to strategic sector information, workshops and monthly newsletters. The sector counts on the National Fund for Pig Farming, a parafiscal fund whose resources are collected through the Pig Farming Promotion Fee.

The **National Poultry Federation (FENAVI)** represents poultry producers at the national level and sets objectives for growth, competitiveness, and sustainability. It provides technical assistance and training services. The poultry sector counts on a National Poultry Fund created in 1994, whose resources are collected through the Poultry Development Fee mainly from companies established for the production of poultry for meat or egg production.

Source: ANALAC (2013); ASOCANA (2013); FEDEGAN (2013); FEDEPALMA (2013); MADR (2013f); SAC (2013a); ASOCOLFLORES (2014); FEDECATE (2014).

Summary

- The institutional framework for designing and implementing agricultural policies is rather complex, thus increasing the risk of overlapping activities, particularly within a context of limited co-ordination between entities.
- Different entities linked to MADR and other Ministries have responsibilities and functions with respect to broader agricultural sector development such as rural public goods; however, responsibilities and functions are not well defined among institutions leading to mis-allocation of financial resources, exacerbated by poor co-ordination.
- The capacity and reach of entities that are associated and linked with MADR appears limited, and institutional arrangements at the departmental and municipality levels seems weak.
- The timing of budget planning and execution between the central and local levels of government is not co-ordinated.
- Entities of MADR such as its local secretariats or local advisory councils appear to have a role in policy formulation and implementation at the local level, but their responsibilities are not sufficiently clear.

ANNEX 4.A1

Description of agricultural institutions

Several ministries and public agencies have responsibilities relating to agriculture. Some areas in which they operate are related to the environment, natural resources use, public goods such as infrastructure and energy, research and agricultural training (Table 4.A1.1).

There are five affiliated entities (*entidades adscritas*) to MADR: ICA, INCODER, URT, UPRA, and AUNAP and nine linked entities (*entidades vinculadas*): Agrarian Bank, FINAGRO, Colombian Agricultural Stock Exchange, ALMAGRARIO, CORABASTOS, VELCOL, Parafiscal Funds, Livestock Funds and CORPOICA. A brief description of all these entities follows:

Affiliated entities

The Colombian Agricultural Institute (*Instituto Colombiano Agropecuario*, ICA) was created in 1962 by Decree 1562 with the objective to co-ordinate and strengthen agricultural research and extension services for a sustained development of all productive activities across the sector. During 1968-72, ICA extended its programmes and included under its responsibilities the certification of seeds, the development of new plant varieties, sanitary control and prevention, as well as input control and supervision. At the beginning of the 1990s, when Colombia entered a decade of opening and increased integration into international markets, ICA went through a major restructuring that led to the separation of animal and plant health supervision functions from the agricultural research functions, the latter being transferred to a new entity: CORPOICA (Table 4.A1.2).

The Colombian Institute for Rural Development (*Instituto Colombiano de Desarrollo Rural*, INCODER) was created by Decree 1300 of 2003, in light of the 2002 Public Administration Restructuring Programme (*Programa de Renovación de la Administración Pública*). INCODER was established in order to encompass all functions previously held by the following institutions that were dismantled: the Colombian Institute of Agrarian Reform (*Instituto Colombiano de la Reforma Agraria*, INCORA), the National Institute for Land (*Instituto Nacional de Adecuación de Tierras*, INAT), the Fund for Co-financing of Rural Investment (*Fondo de Cofinanciación para la Inversión Rural*, DRI), and the National Institute for Fisheries and Aquaculture (*Instituto Nacional de Pesca y Acuicultura*, INPA). In addition to implementing rural development policy, INCODER ensures that the policies and programmes designed at the national level are co-ordinated at the departmental and municipal levels and defines the investments needed in rural areas. At present, INCODER is composed of four operational divisions: adequate land use (supervising infrastructure and irrigation programmes); promotion, monitoring and ethnic issues; productive development (including public calls

Table 4.A1.1. Ministries with responsibilities relating to agriculture

Ministry or agencies	Responsibility relating to agriculture
National Planning Department (DNP)	Defines and promotes the establishment of a strategic vision of the country in the social, economic and environmental sectors through the design, orientation and evaluation of public policies in Colombia, the management and allocation of public investment, the definition of frameworks for the performance of the private sector and the realisation of government plans, programmes and projects.
Ministry of Environment and Sustainable Development (MADS)	Formulating, implementing, and orienting environmental policy to ensure the sustainable development of agricultural activities. It is implementing programmes for improving water management use for agricultural production.
Institute of Hydrology, Meteorology and Environmental Studies (IDEAM)	Compiles and disseminates information on weather conditions (precipitation, temperature, etc.). It publishes bulletins of climate forecast for several crops (<i>Boletín Riesgo agroclimático por cultivo; Boletín para la unidad de territorios agrícolas</i>). It is an entity affiliated to the Ministry of Environment and Sustainable Development.
National Institute of Roads Network (<i>Instituto Nacional de Vías, INVIAS</i>)	In charge of investment for the construction and maintenance of the road network, including tertiary roads. It manages the programme Rural Roads (<i>Caminos Rurales</i>). It is also responsible for the assessment of the quality and quantity of the road network. It is an entity affiliated to the Ministry of Transport.
Ministry of Trade, Industry and Tourism (MinTIC)	In charge of management of marketing co-operation both at domestic and international levels; regulation of tax and procedures for export/import including non-tariff regulations for imported agricultural products; price protection for local products; co-operation in promotion, diplomacy, negotiation, market intelligence.
Ministry of Health and Social Protection	Implements food safety standards through the National Institute for the Surveillance of Food and Medicines (INVIMA). It is also responsible for establishing nutrition policies.
Ministry of Information Technology and Communications (MinCIT)	Responsible for promoting the use of ITC at rural level, with a particular focus to agricultural producers (including Internet and mobile phones applications), and associated hard infrastructure.
Ministry of Labour	It implements programmes for labour formalisation in rural areas. It has a territorial representation through the Regional Observatories of Labour Markets.
PROCOLOMBIA (Former PROEXPORT)	It provides support and comprehensive assistance to agricultural exporters. It is an entity associated to the Ministry of Trade, Industry and Tourism.
Ministry of Mining and Energy (<i>Ministerio de Minas y Energía</i>)	It administers the Fund of financial support for the provision of energy in non-connected areas (<i>Fondo de apoyo financiero para la energización de las zonas no interconectadas, FAZNI</i>) and the Fund of financial support for the provision of energy to rural areas (<i>Fondo de apoyo financiero a la energización de zonas rurales, FAER</i>).
National System of Training (<i>Servicio Nacional de Aprendizaje, SENA</i>)	It is responsible for agricultural training programmes.
Administrative Department of Science, Technology and Innovation (COLCIENCIAS)	Defines the national strategic plans in terms of science and technology and its programmes have to objective of fostering research and diffusion of knowledge across various domains.
National Administrative Department of Statistics (DANE)	It is responsible for the data collection and processing of the 2014 Agricultural Census. Since 2010, it has also been responsible for the collection and centralisation of the data for the National Agricultural Survey (<i>Encuesta Nacional Agropecuaria, ENA</i>) and for managing the Price Information System for Primary Agricultural Products (SIPSA).

Source: Authors' compilation based on MADR (2013f).

for programmes); and rural land (supervising programmes for fallow land surfaces, agrarian reform processes, and production systems). INCODER has developed its own strategic institutional plan which is harmonised with the policy objectives of MADR and the strategies contemplated in the PND 2010-14. This plan is structured along four key objectives: 1) provision of public goods, 2) assets and income generation, 3) management of rural property, and 4) institutional framework for rural development (INCODER, 2013a).

The Special Administrative Unit for Managing Restitution of Forcibly Stripped Land (*Unidad Administrativa Especial de Gestión de Tierras Despojadas, URT*) is the affiliated entity in charge of implementing Law 1448 of 2011 for Victims and Land Restitution (*Ley de Víctimas y Restitución de Tierras*). URT has 17 departmental offices. After registering each request for land restitution, the URT must collect the necessary information that will allow for the physical and legal identification of the land claimed. To achieve this, the URT uses the available information from databases of the Unique Registry of Displaced Population (*Registró Único de Población Desplazada, RUPD*), the Unique Registry

of Abandoned Farms and Territories (*Registro Único de Predios y Territorios Abandonados*, RUPTA) within INCODER, and the Justice and Peace Information System (*Sistema de Información de Justicia y Paz*, SIJYP). The documentation, along with the demand for land restitution, is sent to the relevant judicial body. URT also co-ordinates, among others, with the Agrarian Bank, the National Unit of Protection (*Unidad Nacional de Protección*), the IGAC, the Unit for Attention and Integral Reparation to Victims (*Unidad para la Atención y la Reparación Integral a las Víctimas*). The implementation of the restitution policy is articulated with the Integrated Intelligence Centres for Land Restitution (*Centros Integrados de Inteligencia para la Restitución de Tierras*, CI2-RT) and with the Local Operational Restitution Committees (*Comités Operativos Locales de Restitución*, COLR) in charge of ensuring security in the regions where land has been returned to victims. Moreover, the URT is currently implementing post-restitution programmes. These include the support of agricultural production activities and rural housing subsidies. Households can also receive technical assistance and support for a project development or for a credit application, together with the implementation, monitoring and evaluation of their project.

The Unit for Land Use Planning (*Unidad de Planificación de Tierras Rurales, Adecuación de Tierras y Usos Agropecuarios*, UPRA) was created by Decree 4145 of 2011. Its main functions include the planning of rural land use and land improvement processes for agricultural purposes through the generation of technical, economic, social and environmental criteria and guidelines as a basis for the definition of policies aimed at the sustainable development of natural resources and economic activities (UPRA, 2013). These functions were transferred from the INCODER to UPRA. UPRA is in charge of undertaking technical studies across various departments of Colombia to assess the suitability of land and inefficiencies of current land use. UPRA also undertakes studies on the functioning of regional land markets.

The National Authority for Fisheries and Aquaculture (*Autoridad Nacional de la Acuacultura y la Pesca*, AUNAP) is the affiliated entity responsible for policy design and its implementation in the fisheries sector. The entity was created by Decree 4181 of 2011 to respond to institutional needs and programme implementation that would foster the production and export of fisheries products.

Linked entities

The Agrarian Bank (*Banco Agrario*) is the financial institution linked to MADR that grants credit and other banking services in rural areas. The Agrarian Bank has 738 offices across the country. The Fund for Agricultural Sector Financing (*Fondo para el Financiamiento del Sector Agropecuario*, FINAGRO) is a second tier bank; in its first line of operation, it grants financing to first tier banks such as the Agrarian Bank and in its second line of operation, it administers the resources of the different programmes for this sector, such as the Rural Capitalization Incentive (ICR) or the Forest Incentive Certificate (CIF). Furthermore, FINAGRO supports projects of producer associations. The National Agricultural Stock Exchange is the platform for agricultural commodities exchange and its shares are traded by the Colombian Stock Exchange (BMC). BMC is also an operator for a set of policies implemented by MADR, including price compensation, surplus storage, incentives and financial support to stabilise the incomes of producers, consumer promotional campaigns, or provision of marketing support mechanisms.

The Colombian Corporation for Agricultural Research (*Corporacion Colombiana de Investigacion Agropecuaria, CORPOICA*) was created as a response to the institutional transformation experienced by ICA at the beginning of the 1990s. CORPOICA is a decentralised public entity which aims to develop and implement research, technology transfer and promote technological innovation processes for the agricultural sector. It follows the national agenda of research, development and innovation. It also supports the Subsystem of Agricultural Technical Assistance (SSATA) through the development of methods, systematisation and knowledge transfer (see Part III for more details).

CORABASTOS (*Central de Abastos de Bogota*), located in Bogota, represents the most important wholesale distribution centre for agro-food products in Colombia. ALMAGRARIO represents an important network of storage facilities for agro-food products across Colombia. It provides logistics services related to warehousing of merchandise, customs brokerage, bulk cargo discharge, treatment of grains, container management, handling and distribution of goods and issuance of securities. It is present in the national territory and the main ports. VECOL promotes the improvement of animal health through the production, sale, marketing, import, export and scientific research in biotechnology products, chemicals, and pharmaceuticals for animals.

The Parafiscal Funds (*Fondos Parafiscales*) were established with the objective of providing resources to selected agricultural sub-sectors. Their operations are regulated by Articles 29-35 of Law 101 of 1993. These financial resources are not part of the state budget as they are defined as contributions that the law imposes to selected agricultural sub-sectors in order to provide them with specific services and programmes, including: research and technology transfer and technical assistance, land adequacy, agriculture health control, marketing, promotion of exports and consumption, support for the regulation of supply and demand to protect producers from price variation and economic, social and infrastructure programmes for the benefit of the subsector. They are generally managed by the sub-sector's main agricultural producer associations that gather sufficient representative conditions, but can also be managed by agricultural beneficiary communities. There are currently fifteen products covered by Parafiscal Funds (Contraloría, 2002): coffee (*Fondo Nacional del Café*); cotton (*Fondo Nacional del Algodón*); rice (*Fondo Nacional del Arroz*); cereals (*Fondo Nacional Cerealista*); cocoa (*Fondo Nacional del Cacao*); panela (*Fondo de Fomento Panelero*); cattle farming (*Fondo Nacional del Ganado*); legumes and grains (*Fondo de Fomento de Leguminosas de Granos*); beans and soy (*Fondo de Fomento de Frijol y Soya*); poultry (*Fondo Nacional Avícola*); fruit and vegetables (*Fondo de Fomento Hortifrutícola*); palm oil (*Fondo de Fomento Palmero*); pig farming (*Fondo Nacional de Porcicultura*); tobacco (*Fondo Nacional del Tabaco*); and rubber (*Fondo Nacional del Caúcho*).

Livestock Funds (*Fondos Ganaderos*) are linked entities, with both public (national and decentralised bodies) and private capital participation. Their main activities focus on the improvement of production, processing, marketing, distribution and financing of agricultural goods and services, research programmes and technology transfer. A minimum of 70% of its assets must be allocated to livestock production. However, some of these funds are currently in liquidation due to accumulated losses (MADR, 2013a).

Mixed participation entities

The Colombia International Corporation (*Corporacion Colombia Internacional, CCI*) promotes agricultural and agro-industrial restructuring through the implementation of sustainable competitive agribusiness models by providing strategic sector knowledge and

production development support to farmers across the country. Previously, CCI was the operator charged by MADR in conducting the National Agricultural Survey (*Encuesta Nacional Agropecuaria, ENA*) and managing the Price Information System for primary agricultural products (*Sistema de información de precios, SIPS*) until these were transferred under the responsibility of the National Administrative Department of Statistics (DANE).

Main responsibilities of both types of entities, affiliated and linked, are depicted in Table 4.A1.2.

Table 4.A1.2. Main responsibilities of MADR related entities

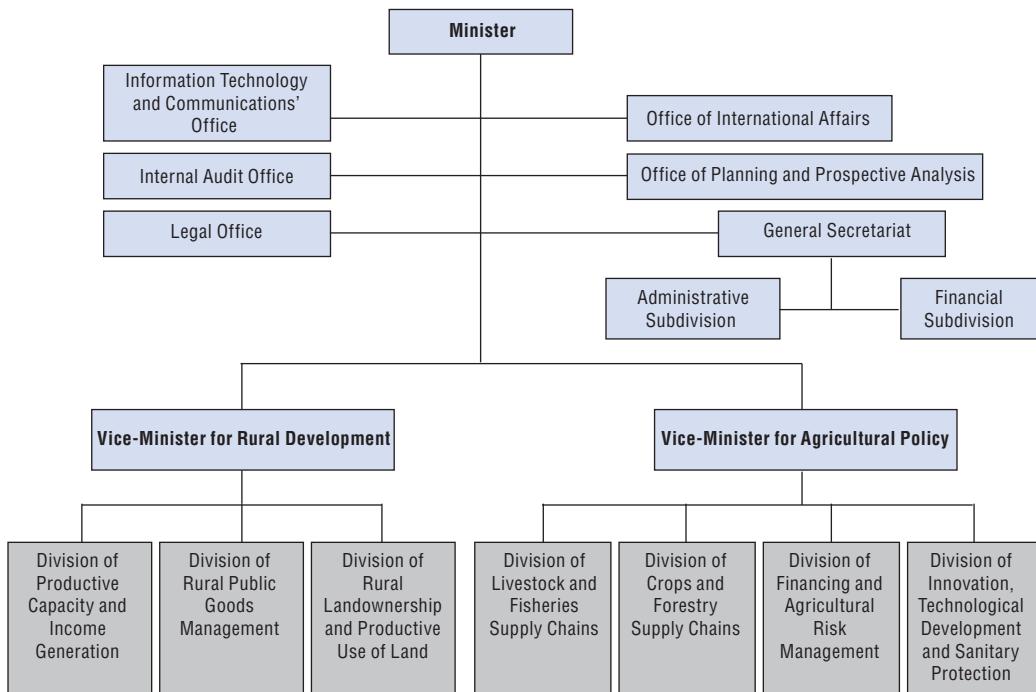
MADR related entities	Activities
Affiliated entities	
Colombian Agricultural Institute (ICA)	Formulating and implementing policies and technical standardisation for animal and plant health protection, including seed certification.
Colombian Institute of Rural Development (INCODER)	It is responsible for overseeing rural development policies, including land rights formalisation and strengthening, adequate infrastructure for land use, land use and minority groups.
Unit for Land Restitution (URT)	In charge of implementing the 2011 Law of Victims and Land Restitution; it registers land requests from displaced population, provides the necessary support in the process of restitution and implements post-restitution programmes (support to production projects and housing).
Unit for Land Use Planning (UPRA)	Responsible for technical assessments and guidelines development with respect to land use and planning.
National Authority for Fisheries and Aquaculture (AUNAP)	Responsible for policy design and implementation in the fisheries and aquaculture sectors.
Linked entities	
Agrarian Bank (BANAGRARIO)	Administrating credits and other banking services addressed to rural population.
Fund for Agricultural Sector Financing (FINAGRO)	Second tier bank with two lines of operation: financing activities of first tier banks and implementing specific programmes destined to agricultural and rural development.
Colombia Agricultural Stock Exchange	The platform for exchanging agricultural commodities.
Parafiscal Funds	Financial resources funds which are administered by producers associations and provide specific services and programmes, including: research and technology transfer and technical assistance, land adequacy, agriculture health control, marketing, promotion of exports and consumption.
Livestock Funds	Focus on the improvement of livestock production, processing, marketing, distribution and financing of agricultural goods and services, research programmes and technology transfer.
CORPOICA	Responsible for agricultural research and development and technology transfer.
CORABASTOS	Represents the most important network of wholesale and distribution centres for agro-food products across Colombia.
Network of Warehouses (ALMAGRARIO)	Provides logistics services related to warehousing of merchandise, customs brokerage, bulk cargo discharge, treatment of grains, container management, handling and distribution of goods and issuance of securities.
VECOL	Promotes the improvement of animal health through the production, sale, marketing, import, export and scientific research in biotechnology products, chemicals, and pharmaceuticals.
Mixed participation entities	
Corporation Colombia International (CCI)	Promotes the agricultural and agro-industrial restructuring with social responsibility through the implementation of Sustainable Competitive Agribusiness Models.

Source: MADR (2013f).

MADR structure

The structure of MADR has been evolving. The current structure, in place since 2013 and established by Decree 1985 of 2013, modified the structure and functions previously set up by Decree 2478 of 1999. MADR has now the Minister's office, two Vice Ministers, legal, financial, administrative offices, and seven thematic divisions (Figure 4.A1.1). Decree 1985 states that these changes are meant to respond to two main objectives: 1) promote a

Figure 4.A1.1. Organisational chart for the Ministry of Agriculture and Rural Development



Source: MADR (2013f).

territorial approach to rural development and strengthen the productivity and competitiveness of the sector via comprehensive measures that improve the living conditions of rural people, enable the sustainable use of natural resources, generate employment, and achieve sustained and balanced growth across regions; and 2) promote institutional actions in rural areas in a targeted and systematic manner under principles of competitiveness, equity, sustainability, and decentralisation for the socio-economic development of the country (MADR, 2014).

Table 4.A1.3. Evolution of agricultural institutions

Institution	Years																							
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Ministry of Agriculture and Rural Development (MADR) (1913-present)																								
Colombian Agricultural Institute (ICA) (1962-present)																								
Fund for Agricultural Sector Financing (FINAGRO) (1990-present)																								
National Agricultural Stock Exchange (BNA) (1979-present)																								
Colombian Corporation for Agricultural Research (CORPOICA) (1993-present)																								
Corporation Colombia International (CCI) (1992-present)																								
Colombian Agrarian Bank (Banco Agrario) (1999-present)																								
Colombian Institute of Agricultural Development (INCODER) (2003-present)																								
National Institute of Fisheries and Aquaculture (INPA) (1990-2003)																								
Agrarian, Industrial and Mining Credit (CAJA AGRARIA) (1931-99)																								
Agricultural Marketing System (IDEMA) (1976-97)																								
Colombian Institute of Hydrology, Meteorology, and Land Infrastructure (HIMAT) (1974-93)																								
National Institute of Renewable Natural Resources (INDERENA) (1968-93)																								
Co-financing fund for rural investment (DRI) (1985-2003)																								
Colombian Institute of Agrarian Reform (INCORA) (1961-2003)																								
National Institute for Land Infrastructure (INAT) (1993/94-2003)																								
National Unit for Rural Land (UNAT) (2007-09)																								
Special Administrative Unit for Managing Restitution of Forcibly Stripped Land (URT) (2011-present)																								
Unit for Land Use Planning (UPRA) (2011-present)																								

Source: Adapted from Perfetti and Olivera (2010).

ANNEX 4.A2

Brief descriptions of two farmer associations: Coffee and flowers

Colombian coffee production

The historical data indicate that coffee was introduced to Colombia around 1730, but it was not until 1835 that the first commercial production was registered with 2 560 green coffee bags exported. However, coffee did not become a major crop until the second half of the 1800s.

In 1927, Colombian coffee growers created an institution to represent them: the Colombian Coffee Growers Federation (FNC or Federation). Today, the Federation represents almost all 560 000 coffee growers in Colombia and is present in over half of Colombia's 1 123 municipalities and in virtually all coffee-growing regions. Coffee growers elect 4 620 representatives at local and provincial levels to 370 municipal coffee grower committees and to 15 departmental committees. The federation is one of the most important associations in Colombia and it is a major executer of governmental policy.

Work areas of the Federation include research and development, technical assistance, extension services, coffee purchases, logistics and warehousing services, international sales and marketing and promotion, among others. It has also supported investments in education, health services, environmental protection and infrastructure for the social development of coffee growers and their families. To finance its activities, the Federation manages the resources of the National Coffee Fund (parafiscal fund), which is financed by the Federation's members through export sales (i.e. farmers contribute a certain sum for each pound of coffee sold on the international market).

CENICAFE is the FNC's research centre and is in charge of generating new knowledge and technologies that are appropriate, competitive and sustainable. Furthermore, the Federation extension service has more than 1 500 extension technicians that deliver different programmes and training to coffee growers. Since 2009, this service has been certified under the international ISO 9001:2008 standards. The Federation commits to purchase coffee from its members. It has a purchasing network made up of over 515 different purchase points operated by 34 coffee growers' co-operatives. This network reaches the most remote areas of the country, allowing growers to sell their coffee relatively near their farms. The reference price established by the Federation is based on the price of the New York Coffee Exchange, the premium paid for Colombian coffee, and the exchange rate. Lastly, the added value strategy of the Federation created the Juan Valdez® brand, which is present in more than 12 countries through 268 stores (FEDECAFE, 2014).

Colombian floriculture industry

Thanks to the soil quality and the competence of its flower growers, Colombia occupies a privileged position on the international floriculture product trade scene. It has been successfully exporting floricultural products for five decades. Today, Colombia is the top provider of flowers to the United States, the top grower and provider of carnations globally, and the second largest cut flower exporter in the world. Flowers for export are grown on approximately 7 000 hectares, 75% of which are located in the savannah of Bogota.

Colombia boasts high sales volumes of its 1 600 varieties of export-quality roses, carnations, Gerber daisies, alstroemerias, chrysanthemums, heliconias and anthuriums. Bouquet products and foliage also represent a key component of the Colombia's floricultural exports. These flowers and foliage are exported to 90 countries, although the United States accounts for three-quarters of export sales.

The Colombian floriculture industry is labour intensive and formal employment is 100%. The industry generates over 80 000 direct jobs and 50 000 indirect jobs, with 25% of its workforce being female heads of household. The industry also contributes 5% of the national agricultural GNP. Almost all flowers are exported: only 5% of total production is earmarked for the local market, and this volume is mainly generated from surplus export production that does not meet overseas-market quality standards.

The Association of Colombian Flower Exporters (ASOCOLFLORES) was founded in 1973 as a non-profit trade association to represent and promote the flower industry in overseas markets and to support the development of the floriculture industry. Asocolflores represents around 70% of Colombian flower exports from more than 280 affiliated farms.

Asocolflores participates in major flower-chain organisations around the world. The association also organises phytosanitary campaigns together with the ICA, and provides a climate-monitoring network for the floriculture industry. It encourages currency exchange risk management among flower farmers, encourages financial planning, and provides training (ASOCOLFLORES, 2014).

Notes

1. From 2005 onwards 13 CONPES have been established for the agricultural sector. CONPES documents require not only the co-ordination between agricultural sector institutions at the national and local levels, but also call upon tight collaboration with other ministries. CONPES documents provide policy guidelines on specific topics and promote co-ordination between ministries and government agencies for the implementation of specific policy action that benefit selected agricultural areas of sub-sectors.
2. A peace process between the government and the Revolutionary Armed Forces of Colombia (FARC) guerrilla was launched in 2012. Several rounds of peace negotiations have been held.

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PART II

Chapter 5

Colombia's agricultural domestic and trade policies

This chapter discusses in detail domestic and trade agricultural policy measures in Colombia since 1990. It first provides an overview of programmes and budgetary allocations in the agricultural sector. The majority of programmes cover very broad and different areas and are implemented through a bundle of policy instruments, the impact of which can be difficult to measure and evaluate. A considerable share of the budgetary allocation is increasingly directed to input subsidies and payments based on output. Producer associations also implement MADR's programmes aside their own programmes. General services provision in Colombia includes agricultural knowledge generation and transfer, inspection and control, infrastructure (including land restructuring), marketing and promotion. The chapter then analyses the evolution of agricultural trade policies. Tariffs applied in the agricultural sector have been much higher than in other sectors during the last two decades. In recent years however, Colombia has signed and enforced several FTAs with key trading partners, under which it has committed to gradually phase out a wide range of agricultural border measures.

Price support measures

In Colombia, price support for the majority of agricultural products is provided through trade protection. Other policy instruments related to price support include a minimum guaranteed price programme for cotton and price stabilisation funds (administered by producers associations).

A minimum guaranteed price (*precio mínimo de garantía*, PMG) policy was introduced in 2001 for cotton producers. When the market price is lower than the minimum guaranteed price the government makes up the difference to producers (MADR, 2013). This compensation is distributed through the Colombian Agricultural Stock Exchange. In 2011, almost 4 000 producers received compensation through this policy (MADR, 2011a, 2012).

Price Stabilisation Funds (*Fondos de Estabilización de precios*, FEPs) provide income support to producers of cotton, palm oil, sugar cane, cocoa, beef meat, and milk (Table 5.1). These transfers are made directly from parafiscal funds (paid by contributions from members of a particular sector or producer association) administered by producer associations. While these funds currently do not represent government outlays, the government provided the initial capital for their set-up. This mechanism is relevant as it can make domestic producer prices higher than international prices, a situation that is detrimental to national consumers (MADR, 2013f).

FEPs are intended to: ensure an income to producers; regulate domestic production; mitigate price volatility; avoid price speculation; and ensure that sales occur at the best price possible for farmers. In other words, FEPs make payments to producers when the selling price of a product falls below a minimum (floor) price. When the sales price of a product is higher than an established maximum (ceiling) price, producers contribute to the FEPs (Figure 5.1). The ceiling and floor prices are established based on selected international prices for each product, while the transfers and compensations take into account a reference price indicator at which the products reach the market.

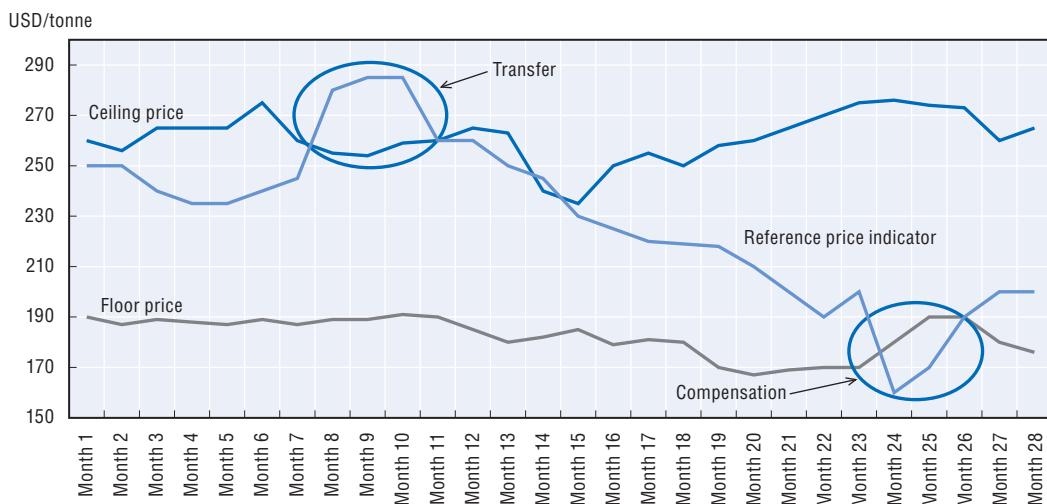
The Fund's Managing Committee is in charge of defining the methodology and guidelines for the allocation of transfers and compensations. The Committee is composed of representatives of MADR, MinCIT, producers, sellers and exporters (if applicable to the coverage of the Fund). The Committee determines the source of relevant international market prices, establishes a price range and a reference price both based on market prices, as well as the difference between the two prices to be transferred to the funds or to compensate the producers, sellers or exporters; this difference ranges between 20% and 80%.

Table 5.1. Price Stabilisation Funds

FEP	Characteristics
The cocoa FEP	Created in 1989 and became operational in 1992, focusing initially on exporters. In 2000, its resources were stored in an investment portfolio managed by Fiducoldex. Since 2010, it has been administered by the National Federation of Cocoa Producers. The international price considered is based on the transactions at the New York Stock Exchange.
The cotton FEP	Created in 1993 and originally administered by Fiduagraria. Since 1999, it has been administered by the Colombian Confederation of Cotton (Conalgodón). In 1993, its operations were temporarily frozen due to lack of resources. In 2004, the FEP took up its operation again. Up to 2011, the Fund increased its budget based on transfers supported by high international prices. The international price considered is based on transactions at the New York Stock Exchange.
The Palm oil, kernel and its fractions FEP	Created by Decree 2354 of 1996 and in 1998 became a parafiscal fund administered by the National Federation of Palm Oil Producers (Fedepalma). In 2012, the calculation of transfers and compensation were reformed through the process known as " <i>Ex post Reform</i> ". Transfers are acquired from producers, wholesalers and exporters for the sales in the most favourable markets to simultaneously compensate for the sales in less favourable markets. This is thus considered a "zero balance account." The Fund is considered to benefit 8 000 palm oil smallholders.
The sugar FEP	Created in 2001 as a complement to the existing Andean Price Band System, considered to be insufficient for attenuating the impact of the international sugar market.
The beef meat and milk FEP	Created in 1997 and administered by the Federation of Livestock Producers (FEDEGAN). It covers producers, wholesalers and exporters of beef meat, milk and related products.

Source: MADR (2013f).

Figure 5.1. The Price Stabilisation Fund mechanism



Source: MADR (2013f).

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Payments based on output

Colombia also has two programmes that provide payments to coffee, cocoa, and rice producers based on output when international prices fall below established levels. Unlike the FEPs, these programmes are funded through the national treasury. The **support programme for coffee** (Protección al Ingreso Cafetero, PIC) was implemented in response to the fall in coffee prices in early 2013. The programme pays farmers for each coffee sack produced (125 kg) of dry parchment coffee (*café pergamino seco*) or its equivalent when the purchase base price is less than COP 700 000 per coffee sack (MADR, 2013g). Coffee producers across all regions of the country can benefit. Approximately 330 000 coffee producers benefitted from the programme between March and August 2013. Government

outlays for this programme in 2013 were around COP 1 trillion (USD 550 million). The coffee farmer association has been the executor of this programme (FNC, 2013).

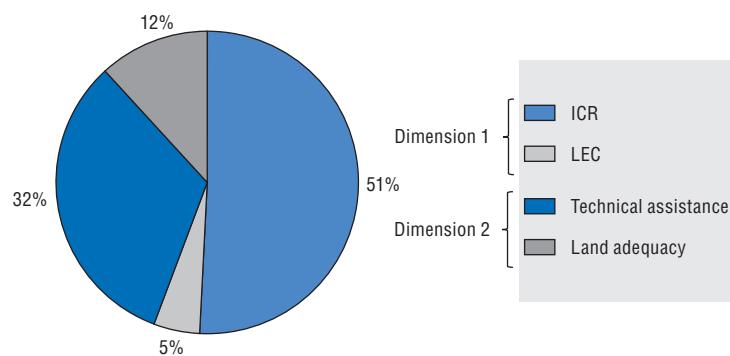
Incentives for cocoa commercialisation (*incentivos a la cormercialización de cacao*) and **incentives for rice commercialisation** (*incentivos a la cormercialización de arroz*) both pay farmers for each tonne of cocoa or rice sold. Total government outlays in 2013 were around USD 6 million for cocoa and USD 6.6 million for rice.

Input support measures

Colombia has several programmes that provide support to different aspects of the production process, including subsidies for variable input use and fixed capital formation, and support for on-farm services. For example, the **Rural Development with Equity** (*Desarrollo Rural con Equidad*, DRE) programme aims to boost agriculture production and reduce inequalities among agricultural producers by providing credit to producers and providing incentives for agricultural production (Figure 5.2) (Contraloría, 2012). Credit provision includes the Special Credit Line (*Línea Especial de Credito*, LEC), which received COP 30 billion (USD 16 million) in 2013 to improve financing for planting and maintaining short-cycle crops that are included in the basic food basket or products intended for export or sensitive to import competition. The **Rural Capital Incentive** (*Incentivo a la Capitalización Rural*, ICR), with a budget of COP 310 billion (USD 166 million) in 2013, supports the modernisation of productive infrastructure, for example by improving water resource management (MADR, 2013a).

Technical assistance and land adequacy (irrigation and drainage investments) are another dimension of the DRE programme. Agricultural **technical assistance** can be financed up to 80% by the programme. Total outlays for 2013 were COP 198 billion (USD 106 million). **Land adequacy** targets producer associations with the main objectives being: i) to build, modernise, rehabilitate or expand irrigation and drainage infrastructure, ii) to undertake studies for irrigation and drainage projects; and iii) to undertake land adequacy projects affected by the rainy season (*ola invernal*). A budget of COP 270 billion was allocated in 2013 (USD 144 million) (MADR, 2013a).

Figure 5.2. **DRE programme: Budget allocation by sub-programme, 2013**



Source: MADR (2013a).

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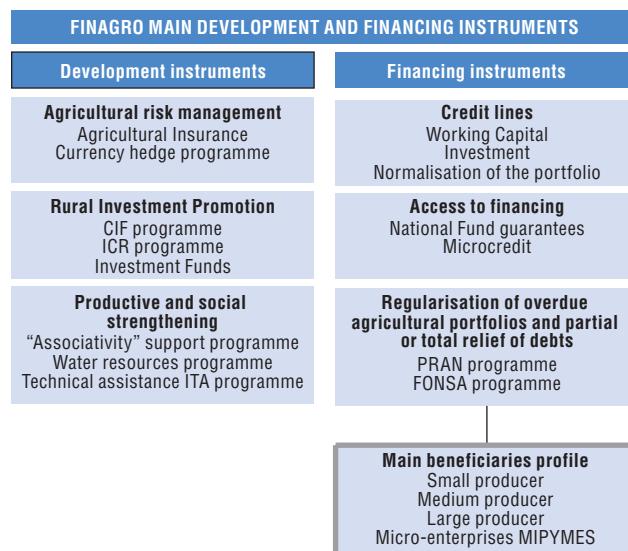
Various entities, including banks, funds and other financial entities, were created to finance agricultural activities and constitute the backbone of the agriculture credit system.

The National Agricultural Credit Committee governs the agricultural credit system. This committee establishes the resources each financial entity of the agricultural credit system should allocate to the sector. It also prioritises sub-sectors to channel financial resources and sets the interest rates for farmers.

One of the main entities of the agricultural credit system is the **Financing Fund for Agriculture (FINAGRO)** which provides funds to retail financial institutions (such as the Agrarian Bank – Banco Agrario). These in turn lend directly to farmers. The total portfolio of FINAGRO in 2013, including loans for 2013 and previous years, was around USD 6.7 billion. FINAGRO is financed in part by a mandatory investment scheme (*exigibilidades*) on the part of credit institutions; this is known as Agricultural Development Titles (*Titulos de Desarrollo Agropecuario, TDA*). TDAs are determined based on the government's economic objectives for the rural sector as set by the National Development Plan, the need to maintain FINAGRO's financing, and the solvency and liquidity of the financial institutions that are obliged to contribute to the TDAs. Without this mechanism of forced investment, credit for the agriculture sector would be limited to only private commercial banks (FINAGRO, 2013c).

FINAGRO is in charge of the implementation of different credit policy instruments and financial services. It has two operational fronts: rural development instruments and financing instruments (Figure 5.3).

Figure 5.3. **Overview of FINAGRO's main development and financing instruments**



Source: FINAGRO (2013c).

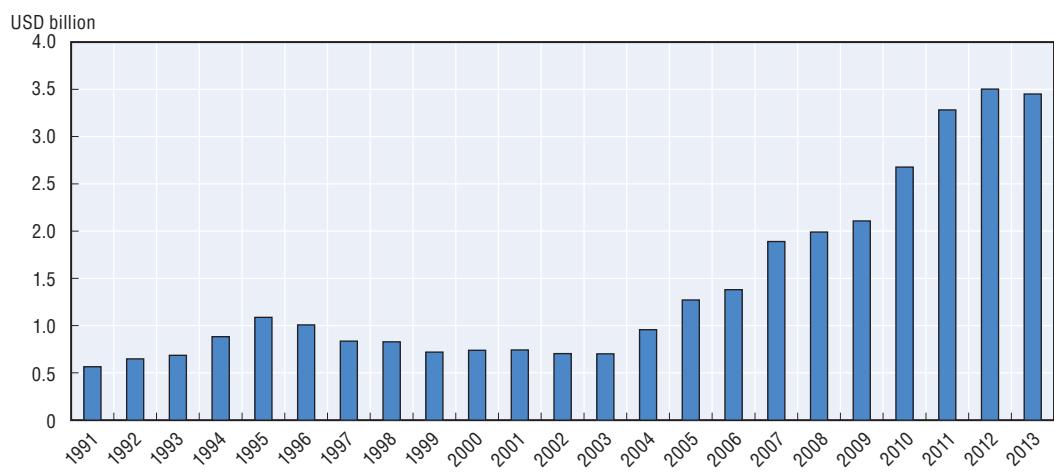
Development instruments of FINAGRO include several categories:

- **Agricultural risk management** instruments include agricultural insurance and currency hedging. The government subsidises up to 80% of the cost of insurance premiums; farmers pay the remaining 20% and the VAT.
- Instruments for **rural investment** promotion: These include financial support directed through the Special Credit Line (*Línea Especial de Crédito, LEC*) and the ICR within the DRE programme, and investment funds.

- Instruments supporting **productive processes**: These include financial support to boosting farmers' competitiveness through producer associations, in order to improve marketing, technical assistance, and innovation. The water resources programme, for example, seeks to boost irrigation and drainage works (FINAGRO, 2013d).
- **Debt rescheduling and debt relief**: The National Agricultural Revitalisation Programme (*Programa de Reactivación del Sector Agropecuario a Nivel Nacional, PRAN*) provides resources to restructure liabilities, adjust overdue loans and end litigation processes, as well as providing producers with the opportunity to reinstate their credit rating. The National Agricultural Solidarity Fund (*Fondo Nacional de Solidaridad Agropecuaria, FONSA*) provides financial support through partial or total debt relief to small agricultural and fishing farmers faced with climate, phytosanitary or pest problems (FINAGRO, 2013c).

Figure 5.4 shows the evolution of the total credit allocated to the agricultural sector through FINAGRO. The implicit subsidy, derived from preferential interest rates, of total loan allocations of FINAGRO for 2013 was around COP 203 billion (USD 108 million).

Figure 5.4. Evolution of credit allocations by FINAGRO, 1991-2013



Source: FINAGRO (2014).

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FINAGRO also administers the **Agricultural Guarantee Fund** (*Fondo Agropecuario de Garantías, FAG*). This fund was created in 1985 to provide collateral to farmers, particularly smallholders or producer associations not able to provide the collateral required by financial entities (FINAGRO, 2012). As of December 2013, the Fund had 800 000 certificates, amounting to the equivalent of USD 2 million. Around 90% of the beneficiaries are smallholders.

The Agrarian Bank delivers credit and a **microcredit programme** which provides different types of credit (working capital, equipment, investment, etc.) to small-scale famers consistent with the needs and expectations of low-income farmers, and with the idea of strengthening their business and production activities. Another programme is the **coffee credit support** (*Implementación del programa de reactivación cafetero a nivel nacional convenio FINAGRO*). It consists of buying overdue loans by the government through FINAGRO. The programme has bought 61 500 loans valued at COP 164 million (USD 88 000).

Banking programme (*Programa Bancarización*) Banking and financial inclusion is promoted through financial education workshops, which aim to familiarise people with economic, financial and accounting concepts, financial planning tools, construction budget, savings, and to increase the use of transactional services. About 50% of participants who attended the workshops had no previous experience with the financial system.

Agricultural insurance. Insurance instruments include the following programmes: 1) Insurance policies (*pólizas de seguros*), 2) The price hedge programme for maize producers, 3) The currency hedge programme for agricultural products.

Insurance policy is a mechanism by which producers can buy agricultural insurance either individually or collectively, to protect themselves against climate risks, phytosanitary and pests risks. Outlays for 2013 were COP 20 billion (USD 10 million). MADR can grant a subsidy of up to 80% of the insurance prime, which depends on the type of producer and whether the area to be insured has been financed with credit resources of FINAGRO. As an additional incentive, the VAT for the insurance policy value was reduced from 16% to 5%, a saving of COP 111 million (USD 59 000).

The hedge programme against price fluctuations for maize producers was developed in 2012 to offer protection against the fall in international prices. According to Resolution 103 of 2013, this instrument was designed for the maize sub-sector due to volatile international prices. Producers of yellow maize can purchase "American Put Options" at the Chicago Mercantile Exchange that would enable them to mitigate losses from the fall of international prices. The direct benefit consists in subsidising the cost of the hedge premium that the producer purchases. The Colombian National Agricultural Stock Exchange (BCM) is in charge of implementing the programme. Producers benefitting from this programme fall within three groups: Group 1 (producers with 0-10 ha) will receive 100% coverage, Group 2 (producers with 10-30 ha) will receive 80% coverage and Group 3 (producers with over 30 ha) will receive 70% coverage. Outlays for this programme in 2013 were USD 8 million (DNP, 2014; MADR, 2014b).

Currency hedge programme for exporters of agricultural products protects farmers' incomes from exchange rate fluctuations. MADR provides an incentive to agricultural, livestock and aquaculture products for the purchase of "European Put Options" in order to mitigate exchange rate uncertainty, thus reducing potential economic losses from the fall in the exchange rate and protecting when possible the employment generated by these activities (MADR, 2013a). FINAGRO is the entity in charge of its implementation via the **Electronic System of the Hedging Program** (*Sistema Electrónica para el Programa de Coberturas, SEPC*). This electronic system streamlines the registration of beneficiaries, the hedges adopted, invoice registration and hedges compensation. Support is granted under the scheme on a "first come, first served" basis until the financial resources available are allocated.

MADR defines four groups of producers that may participate, categorised by the value of their assets: small-scale producers (with assets below COP 85 million), medium-scale type 1 producers (with assets above COP 85 million, and lower or equal to COP 360 million), medium-scale type 2 producers (with assets above COP 360 million, and lower or equal to COP 2 833 million), and large-scale producers (with assets above or equal to COP 2 833 million). Ninety per cent of premium costs for small producers and medium type 1 producers are covered, while only 70% is covered for medium type 2 and large-scale

producers (FINAGRO, 2013d). The majority of the beneficiaries of this programme are flowers producers in Bogota, Antioquia, and Cundinamarca, banana producers in Antioquia, and sugar cane producers in Valle del Cauca. Expenditures in 2013 were equivalent to COP 41.5 billion (USD 22 million).

The Commercialisation Fund for Agricultural Products (*Implementación y operación fondo de comercialización de productos agropecuarios a nivel nacional*) project has various components with different implementation characteristics that provide mainly input subsidies and payments based on output. Its budget in 2013 was COP 83 billion (USD 43 million). Components of the programme are as follows:

- Incentives for cocoa commercialisation (*Incentivos a la comercialización del cacao*). The description of this programme is covered in the section on payments based on output.
- Incentive for rice commercialisation – direct payments (*Incentivo a la comercialización de arroz*). The description of this programme is covered in the section on payments based on output.
- Price hedging programme for yellow maize (*Programa de cobertura en precio para maíz amarillo*). The description of this programme is covered in the section on agricultural insurance.
- Stockholding subsidy for rice (*Incentivo para el almacenamiento de arroz*). The government provides subsidies to rice farmers to store rice produced during the second half of the year with the idea of avoiding a decrease in domestic rice prices. Outlays for 2013 were around USD 6 million.
- Support for panela commercialisation (*Fortalecimiento al Programa Integral de Apoyo a la Comercialización de Productos Paneleros a nivel Nacional*). This is a marketing and promotion programme of *panela* (brown sugar). The total amount channelled to this programme from 2010 to 2014 was of USD 1 million.
- Support to improve productivity and increase the production of cocoa – including on-farm services (*Apoyo a la productividad y aumento a la oferta de cacao en grano*). This programme provides technical assistance to cocoa farmers to renovate plantations and improve agricultural practices. It also provides payments for renovation of plantations. It is implemented by Fedecacao, which is the farmer association of cocoa producers. The budget for 2013 was around USD 6 million.

Productive Alliances (*Alianzas Productivas*) programme promotes productive development in the rural area. The objective of this programme is to generate income, create employment and promote social cohesion among poor rural communities. It seeks to link small farmers to organised markets through a formal marketing structure. It finances the productive project and its feasibility studies, as well as co-finances productive investment that smallholders may require. This programme has components of variable inputs subsidies, fixed capital formation subsidies, on-farm services, and components of the general services. The budget allocated to this programme in 2013 was of COP 70 billion (USD 37.5 million). There is also another component of productive alliances for the **milk sector** (*Alianzas Productivas para el sector lácteo*). This programme promotes strategic alliances between small/medium-scale farmers and agribusiness companies for the production and commercialisation of milk. In 2013, this sector was the most financed sub-sector under this programme with a total of COP 7 767 million (USD 4.1 million).

Government **purchases of milk** (*Compras institucionales de leche*) is another programme for the milk sector. The milk is used in a programme geared to reducing poverty and malnutrition. In 2013, the total budget allocated to this programme was COP 12 247 million (USD 6.5 million).

In 2013 the programme Support for **Productivity Improvement** of the Agricultural and Fisheries Sector (*Implementación plan de impulso a la productividad del sector agropecuario y pesquero nacional*, PIPE) was created. It provides different kinds of variable input subsidies. Outlays for that initial year were around USD 80 million.

In order to promote productive development and income generation for the rural poor population, a set of programmes that target specific groups of population have been set up. **Rural Opportunities** (*Oportunidades Rurales*) is a programme aimed to improve the productive capacities and competitiveness of rural entrepreneurs. This is focused on improving the quality of produced agro-food products, managerial capacities and marketing processes. **Building Rural Entrepreneurial Capacities** (*Construyendo Capacidades Empresariales Rurales*) appears as a complementary programme oriented to strengthen the entrepreneurial capacities in rural areas. The programme targets rural families in extreme poverty, more concretely smallholders, indigenous peoples, afro-Colombian communities, households headed by women, rural youth and rural households affected by forced displaced. It subsidises associative capital, financial assets and knowledge management to rural populations with agricultural productive projects in agribusiness, agro-tourism and handcrafts. This programme was created to widen the coverage of beneficiaries under a similar approach of the Rural Opportunities programme (COMPES 3709 of 2011). This programme has components of variable inputs subsidies, fixed capital formation subsidies, on-farm services, and components of the general services. Expenditures for this programme in 2013 were COP 19.4 billion (USD 10.4 million).

The **Plan for the Maize Sector** (*Plan País Maíz*) is a comprehensive programme set up in 2013, oriented to increase food security in the country and improve the domestic supply of yellow maize, which could partly reduce feed stock imports. White maize has been progressively included in the plan. The programme has different components, among which price hedges, incentives for storage, or support to transport (MADR, 2013a). Resolution 306 of 2012 established that the transport costs to be covered per tonne of maize production from any area to any domestic destination will correspond to the amount of the freight bill. Resolution 293 of 2012 established for the second semester of 2012 the allocation, through the National Agricultural Stock Exchange, of an incentive to store maize surpluses generated in all areas of production. A maximum quota of 20% of storage per producer was set. Expenditures for the programme were COP 1 200 million in 2013 (USD 642 000).

The supply chains for cotton fibre and cocoa have also received this type of marketing support. Cocoa is seen as a key alternative economic activity to illicit crops. In 2012, the **Ten-Year Cocoa Plan** (*Plan Decenal para el Sector Cacaotero*) was set up with the objective of increasing the area allocated to production. Similar to the Plan Maíz, this programme has different support components, including marketing support. A direct support was given in 2011, due to a price fall registered in 2011, to 28 490 cocoa producers (MADR, 2013a). Outlays for this programme were USD 4.7 million in 2013.

The **Support for Rural Woman** (*Mujer Rural*) programme seeks to improve living conditions, reduce poverty and vulnerability by increasing income and employment opportunities for women in rural areas and the households they form part of. Resources

are allocated for the development of agricultural productive projects. Beneficiaries are organisations or associations of vulnerable women residing in areas of territorial consolidation. This programme has components of variable inputs subsidies, fixed capital formation subsidies, on-farm services, and components of the general services. Outlays for this programme in 2013 were COP 7 billion (USD 3.7 million).

Emergency programmes. During November 2010-July 2011, Colombia faced extreme weather conditions due to the meteorological phenomena known as *La Niña*. This led to a heavy rainy season (*ola invernal*) that generated floods and substantial losses in different sectors. In the case of agriculture, the weather phenomenon impacted more than 1 million ha of crops and flooded pastures (see Chapter 3 for more details). Other impacts included the death of approximately 170 000 livestock and the emergence of various sanitary and phytosanitary problems.

As a response to this situation, MADR designed and implemented a **Sector Recovery Plan** that included fifteen programmes across four main areas: economic recovery, attention to health measures, economic support, and infrastructure and housing. Specific programmes included: 1) The direct supply of certified seeds in the case of selected crops affected by flooding (cassava, banana, plantain, sweet potatoes), particularly for smallholders, 2) The supply of seeds for replanting pastures located in the high and low tropical zones, 3) Financial support to the reconstitution of livestock numbers, 4) Support for the rehabilitation of drainage and irrigation works affected by the second rainy season 2011-12, 5) Municipal clusters for the extension and improvement of small cattle farms (ASISTEGAN), 6) Regional programmes for economic recovery (REACTIVAR), 7) Credit and debt relief programmes (MADR, 2013a).

The recovery programmes destined to the cattle sector were implemented jointly with the National Association of Cattle Farmers (FEDEGAN). Some of the programmes implemented in 2011-12 have been extended for the year 2013 in order to support the recovery of producers, particularly in the Atlantic region. Expenditures for the programme came from the Parafiscal Fund defined by the Law 089. The Fund supports different programmes such as animal health, science and technology, productive supply chains, research and socio-economic studies, and consumption campaigns.

Tax concessions

In Colombia, **taxes** are levied at the national, provincial, district or local levels. National taxes apply to all natural or legal persons resident in the territory. The main taxes categories in Colombia include income, value-added (VAT – called “sales tax” in Colombia), financial movements, industry and commerce (district or municipal tax), property (district or municipal tax), and vehicles (district or municipal tax) (Ministry of Finance, 2013).

In general, VAT is automatically applied to all transactions; however, the 2012 tax reform law introduced preferential tax treatment for a wide range of agricultural products. For example, supplies, equipment, and seeds are now excluded from VAT, as are irrigation systems. Fertilisers, pesticides, medicines and vaccines were already excluded from VAT. Animal feed, tools and machinery for soil preparation are now subject to a preferential 5% rate rather than the 10% standard rate. The reform also reduced VAT for certain products such as coffee, cereals, and wheat flour, from 10% to 5%, while live animals (pig, sheep, goat, and poultry), fish, dried fish, tomatoes, onions, potatoes, lettuce, carrots and other vegetables continue to be excluded from the VAT regime. Other products are exempt –

rather than excluded – from VAT, meaning that the VAT applied to them is 0% (see Annex 5.A1 for more details). Agricultural production activities, land purchases, investments in irrigation systems and commercialisation of agricultural products are excluded from all taxes (MADR, 2012).

General services provision

General services in Colombia include agricultural research and transfer, inspection and control, infrastructure (including farm restructuring), marketing, and promotion. These services are provided by MADR and its related entities, but also by other government ministries and their attached agencies.

The **research and development** (R&D) system is a complex network seeking to improve the competitiveness of different agriculture supply chains. The objective of the system is to provide access to knowledge and technology. The SNCTA is part of a broader National Science, Technology and Innovation System that guides the national policy on science, technology and innovation. The framework for this policy was developed in the CONPES policy document 3582 of 2009 and has been enhanced through the PND 2010-14. Innovation is addressed by the PND as a key element to foster the growth of the key sectors in the Colombian economy. The agricultural innovation system is analysed in depth in Part III of the Review.

The **Rural Youth** (*Jovenes Rurales*) programme aims to improve the technical and business skills of young people from poor segments of the population or among those who have not complemented primary or secondary education in order to improve their employment prospects (MADR, 2012, 2013a). Expenditures for this programme in 2013 were COP 15 billion (USD 8 million).

Agriculture **inspection and control** policy ensures that the country's agricultural products meet the sanitary standards in Colombia's export markets. For example, the Phytosanitary Alert System (*Sistema de Alerta Fitosanitario*, SAF) provides information on the situation of plant and animal disease across Colombia.

Currently there are specific policy actions to bring Colombia's national **sanitary and phytosanitary** measures (*medidas sanitarias y fitosanitarias*, MSF) in line with international sanitary and phytosanitary standards. Specific efforts in this area include establishing traceability systems, preventing contraband products, improving the information available to consumers, and meeting international trade requirements. The National System of Identification and Information of Cattle (SINIGAN) is an example of traceability for the beef meat supply chain.

Land restructuring programmes. A “comprehensive land policy” was launched through the National Development Plan 2010-14. This includes land restitution, land tenure regularisation, comprehensive subsidies for land acquisition, and the strengthening of Peasant Reserve Zones (*Zonas de Reserva Campesina*). These policy actions are implemented by a range of different institutions, some of them recently created.

Land dispossession, forced displacement, land abandonment, combined with a historic absence of agrarian reforms, have been obstacles in the rural population's access to land. Through Law 1448 of 2011 (the “Victims’ law”), a set of reparation measures to conflict victims were implemented, including **land restitution** (see Chapter 3). When physical land restitution is not possible, victims are given financial compensation. Post-restitution actions include the implementation of productive projects, access to credit, and

access to rural housing subsidies. A complementary programme includes allocating land formerly used for illicit crops to conflict victims or poor farmers.

The government has also been promoting the **regularisation of the status and occupation of idle land** (*tierras baldías*), which is to say that land can be allocated to poor peasants or used to establish Peasant Reserve Zones (*Zonas de Reserva Campesina*). The idle land to be allocated must be suitable for productive agricultural activities and can be allocated to natural persons as well as to foundations, producer associations, public entities for infrastructure projects or the provision of public services. Allocation of this land to individuals is promoted particularly when they are settled in areas targeted for farm restructuring and rural development, Peasant Reserve Areas, areas affected by forced displacement and where subsequent return of displaced population to former properties is taking place.

INCODER also manages the **Agrarian National Fund** (*Fondo Nacional Agropecuario, FNA*), which seeks to **formalise ownership to land**, particularly for small and medium farmers. There is an effort towards collective land titling and formalisation for afro-Colombian communities.

Another policy instrument is the **comprehensive land subsidy**. This is a state payment to small farmers and rural workers to help them buy, register or improve land. The subsidy is allocated through an open public call and priority can be given to displaced population.

Land access policies are complemented by **land regularisation instruments**. While it is known that many farmers do not use formal land markets for land transactions (e.g. buying, selling, renting), there is little understanding of the way in which the land market actually functions. As a first step toward understanding these issues, the government commissioned in 2013 a study through UPRA on the different factors that affect the functioning of land markets in Colombia. At the time, land regularisation instruments are used to resolve conflicts associated with the ownership, use and exploitation of land. They include administrative procedures to clarify property ownership, demarcate property boundaries, recover land that is unlawfully occupied and manage communal land (INCODER, 2013a). Land regularisation includes the **formalisation of land ownership**. In spite of progress in this area, approximately 48% of all rural properties do not have legal property titles and legal title for about 61% of dispossessed and abandoned properties need to be regularised (MADR, 2013a). The absence of formal property title affects land markets, agricultural production, rural public investment and allocation of resources to the sector. MADR created the ten-year Rural Property Formalisation Programme to address this issue: it is expected to benefit 500 000 households. This programme is meant to formalise the status of a very large number of properties while also creating a culture of formal property rights (MADR, 2013a). As part of this process, some forest areas that have been damaged by human intervention and lost their status of forest area reserves can regain their status within the framework of environmental and ecosystem protection.

There are also programmes focused on ensuring the suitability of land for agricultural purposes. Referred to as **adequacy of land**, programmes implemented through the National Fund for Land Adequacy or Improvement (*Fondo Nacional de Adecuacion de Tierras*) provide irrigation and drainage infrastructure, flood controls, and water storage and regulation facilities to protect and improve productivity in the agricultural sector. These

projects are often carried out in land adequacy districts (*distritos de adecuación de tierras*) (INCODER, 2013b). In addition, there are programmes to deal with **soil erosion** (*control de la erosión*) and for the recuperation/improvement of degraded land (*recuperación de suelos en áreas degradadas*), which are implemented by the Ministry of Environment and Sustainable Development (MADS) (MADS, 2013a).

As was noted previously, the **road network** in Colombia is poorly developed. The Ministry of Transport's Plan 2050 aims to pave 3 125 km of road network in 31 departments in order to improve accessibility and connectivity to and from remote regions (Ministry of Transport, 2011). The ministry's Pathways to Prosperity (*Caminos para la prosperidad*) programme also aims to improve the road transport network across 50 000 km by improving drainage and making road repairs (Ministry of Transport, 2013).

Energy provision. Colombia is expanding its electricity network in rural zones, many of which are still not connected to the main electrical grid. In addition, there are non-interconnected zones (*Zonas No Interconectadas*, ZNIs) that are not linked to the main system through lines of high voltage transmission; instead, they are connected to small hydro-plants or thermo-electric power stations (Ministry of Mining and Energy, 2013a).

The Fund for Financial Support for the Energy Provision in Non-Interconnected Zones (*Fondo de Apoyo Financiero para la Energización de las Zonas No Interconectadas*, FAZNI) supports the construction of new electrical infrastructure and the replacement and rehabilitation of existing infrastructure to reach ZNIs (Ministry of Mining and Energy, 2013b). Another fund, the Fund of Financial Support to Rural Energy Provision (*Fondo de Apoyo Financiero para la Energización de las Zonas Rurales*, FAER) provides money so that local authorities, together with electric power companies, can invest in new electrical infrastructure in rural zones not yet properly connected to main electrical grids (Ministry of Mining and Energy, 2013b).

Management of water resources and irrigation is fragmented and there is no coherent national strategy in place. The **use of water** for the agriculture sector is managed through specific entities at national and local level, connected to MADR and the Ministry of Environment and Sustainable Development (MADS). Environmental Autonomous Regional Corporations (CARs) are in charge of water resources management and policies at the national, regional and watershed level. INCODER is responsible for financing and constructing public irrigation networks, although two thirds of the existing irrigation schemes have been financed by the private sector. Since the mid-1950s, the government began devolving irrigation management responsibility to water users associations. This meant that the associated costs of administration and maintenance would be recovered through water use tariffs. Most large irrigation systems have created administrative entities for their operation and maintenance, while this has not functioned as well in the case of small irrigation systems. In some regions, CARs and municipalities can finance the maintenance of the irrigation channels.

Before initiating a new irrigation system, INCODER has to request a water use permit from the corresponding CAR in a jurisdiction. Water use charges were established in Law 99 (1993) and defined in Decree 155 (2004). These charges have two components: "minimum" and regional. The "minimum" is established every year by MADS. The regional component is set every year by CARs and takes into account water availability, socio-economic aspects, necessary investment, and other local characteristics; this is collected by CARs and should be invested in the watershed. As regards operation and maintenance of an irrigation system under the responsibility of a user association or INCODER, costs

should be recovered through a fixed water charge (paid yearly per hectare) and a variable water charge based on the volume of water delivered for irrigation. Factual information on actual fees collection and efficiency of such systems remains scarce across the different regions. These changes are meant to improve the quality of the irrigation system in the country.

Information technology and communications (ITC). The Ministry of Information Technology and Communications (MinTIC) has contributed to developing ITC applications that would provide information services to agricultural producers. The objective is to create products and services that meet specific needs of each sector and achieve the integration of ITC tools into the supply chains. As regards the agriculture sector, 2 000 small enterprises have benefitted so far of financing through this programme (MinTIC, 2013a, 2013b). **AGRONET** was developed by MADR. It is an Internet website that provides strategic, timely and concise information to the agricultural sector. The website includes more than 350 policy documents and statistical bulletins, more than 40 databases containing information on agricultural production, production costs, prices, or trade statistics. **CELUAGRONET** was created in order to strengthen the use of agricultural information technology. Agricultural producers can obtain information through text messages via mobile phones for the main variables of the sector such as input and output prices. With the support of entities such as DANE and IDEAM, other specific tools have been developed including **AGROCLIMA** which provides information on weather conditions. **The Price Information System** (*Sistema de Información de Precios, SIPS*) system provides information on prices for key agricultural commodities and inputs. The System allows for the compilation of information on agricultural inputs prices in the framework of input prices oversight, which includes selected fertilisers, pesticides, veterinary medication, and other biological products.

In order to boost the productivity of specific sectors, MADR is engaged in the **marketing and promotion** of certain agro-food products, such as milk, *panela* and flowers. In addition to the policy actions and strategies that MADR undertakes on marketing and promotion, **PROCOLOMBIA (Former PROEXPORT)** is in charge of the marketing and export promotion of agricultural products, while it is also responsible for the promotion of tourism, foreign investment and non-traditional exports (see Section 5.13 for more details). PROCOLOMBIA has a sub-division responsible for agro-industry and has undertaken actions related to market information and capacity building for the identification of opportunities within the agro-industry sector. These include training and information on best practices and recommendations as regards integration into international markets (PROEXPORT, 2013a, 2013b).

Rural and territorial development

Policy instruments for rural development have the objectives of improving incomes for rural population, of providing access to a wide range of public goods and services as well as supporting agricultural activities. Rural development policies are seen as complementary to agricultural policies.

The **Contratos Plan** represent a tool aimed at promoting co-ordination among the various local authorities in order to boost regional development. This tool is structured around a shared vision of regional development among the territorial entities that decided to strengthen efforts for the integrated development of a particular area (MADR, 2013a).

The newly created **General System of Royalties** (*Sistema General de Regalías*, SGR) led to the development of six funds oriented towards a better redistribution of revenues derived from the exploitation of non-renewable natural resources. The objective of the new system is to support regions' competitiveness, spur regional growth, and reduce income inequality. According to Law 1530 of 2012 that regulates the SGR, the Governing and Decision Management Bodies (OCADs) play a central role in defining the investment projects to be funded with the SGR's resources. Territorial entities, such as municipalities and departments, and representatives from minority ethnic communities, can submit projects for OCADs' consideration. So far, projects have covered infrastructure, education, health, agriculture, mining and energy, housing and sanitation, among others areas (MADR, 2012, 2013a).

From the six funds that are included in the SGR, the **Fund for Science, Innovation and Technology**, the **Regional Compensation Fund** and the **Regional Development Fund** have played a key role in allocating resources for projects in the agriculture sector. During the period of operation of the new royalties system, 159 projects have been approved for the agricultural sector corresponding to an amount that exceeds COP 250 billion. MADR has provided support to OCADs in the approval and implementation of such projects.

Other specific programmes include strategies for the clearing areas cultivated with illicit crops and substituting illegal activities. Since 2004, the government has focussed its actions in specific regions of the country that have been affected by the presence of illegal armed groups and illicit crops. For instance, the Presidency's Programme against Illicit Crops (*Programa Contra los Cultivos Ilicitos*, PCI) initiated in 2005, sought to progressively eliminate illicit crops and illegal activities through a combination of illegal crop eradication and prevention projects in part by substituting illicit crops with licit crops such as rubber, cocoa, palm oil; and the implementation of social, productive, environmental and institutional activities that would foster the development and maintenance of licit activities; and creation of producers' organisations (DPCI, 2012). In 2010, this project was complemented by the establishment of a National Policy for Illicit Crop Manual Eradication and Alternative Development for Territorial Consolidation (UACT, 2013).

While not included in the provision of general services, MADR also implements **Rural Housing Programme**, which seeks to improve the quality of life for the households of the poorest segments of the rural population as well as those living in indigenous reserves, afro-Colombian communities, other ethnic communities (*palenqueras raizales*), and populations that have been affected by natural disasters or armed conflict. The programme provides rural housing subsidies meant to improve housing and basic sanitation by financing new housing construction and purchasing (MADR, 2013a). For the period 2010-14, more than 42 000 houses were delivered.

Environmental measures

Environmental measures include various programmes implemented by the Ministry of Environment and Sustainable Development (MADS) and its regional entities, the Autonomous Regional Corporations (*Corporaciones Autónomas Regionales*, CARs). These programmes encourage farmers to apply proper environmental farm management and production processes (*educación ambiental – producción sostenible*); to improve water management and use for agricultural production (*manejo del recurso hidrónico; optimización del uso de agua; conservación, manejo y recuperación de cuencas*); and to improve

production processes in ecologically fragile areas. However, information on budgetary data shows that these programmes appear to be rather short-term projects and had not been allocated steady budgetary resources over the period 1990-2013.

Labour conditions

The Ministry of Labour undertakes different policy actions to formalise and improve labour conditions across different sectors and regions. These actions undertake studies and analyses of municipalities' economic structures in order to identify the main challenges to employment generation. A "formalisation strategy" for the agriculture sector is in progress, which will provide rural workers and enterprises with training, capacity building, guidance for recruitment processes, and access to the social security system. Included in this is an analysis of informality in the agricultural sector (Ministry of Labour, 2013a, 2013b).

Agro-food trade policy

As outlined in the National Development Plan (PND), Colombia aims to consolidate and diversify export markets for high-quality agro-food products. MADR has set the specific target of increasing by 20%, over the next five years, agricultural exports with the countries with which Colombia has an FTA, as well as increasing by 20% its agricultural exports to Asian countries (MADR, 2013m).

Policy challenges to international integration include raising productivity in agribusiness, fostering new businesses and increasing the entrepreneurial capacity of producers and their integration into supply chains, promoting production clusters and improving both internal and external marketing channels, as well as consolidating the implementation of sanitary and phytosanitary measures.

Trade reforms

The beginning of the 90s decade is characterised by a marked opening towards international markets and adoption of trade liberalisation measures. This focused mainly on the elimination of direct controls on prices and trade and other non-tariff barriers, and to a lower extent on tariff reduction. Emphasis was set on promoting investment mechanisms and modernisation of production in a more open environment.

The state trading company Agricultural Marketing System (*Instituto de Mercadeo Agropecuario, IDEMA*) was gradually dismantled over 1990-97. IDEMA had been created in 1968 to regulate the domestic supply of agricultural products by controlling the purchase, sale, storage, export and import of grains. IDEMA bought farmers' outputs at government regulated prices, maintained buffer stocks to stabilise prices, assisted in the distribution of basic products in remote areas, built market infrastructure in rural areas and developed central supply markets, collection centres and storage facilities (*centrales de abastos*) in the main cities across the country.

The liberalisation strategy also included customs reform with the aim of simplifying the regulatory framework, and reducing costs associated with international trade. Ports were privatised and tariffs and handling costs declined.

Although the objective was to create a neutral incentive structure for private decision makers by subjecting agriculture to essentially the same trade measures as other sectors, this was not completely achieved. Powerful farm interest groups, citing a sharp decline in

profits and the collapse of the agricultural sector, pressured the government to adopt various policy interventions. In June 1991, the government introduced a price band system for six agricultural commodities, their substitutes, and derivatives. Then in 1995, Colombia adopted the Andean Community Price Band System, which included 13 agricultural products.

While several import licensing requirements were eliminated in the early 1990s, in 1994 Colombia implemented procurement agreements (*convenios de absorción*) that required importers of grains and oils to purchase specified quantities of domestically produced goods as a pre-condition for being granted import licenses (CONPES 2723 of 1994). The procurement agreements were abolished in 2003 to comply with WTO regulations.

Most recently, Colombia has concluded several trade agreements with important trading partners such as the United States, the European Union, Canada, and MERCOSUR, among others. During negotiations of FTAs, farmers' associations often demand higher levels of protection for their products (in terms of market access, import tariffs, safeguards, etc.). As a result, sensitive products such as rice, sugar, maize, beef meat, and poultry meat have been either excluded from negotiations or have benefitted from long tariff phase-out periods (Box 5.1).

Box 5.1. Agricultural elements of Colombia's trade agreements

Colombia is a founding member of the **Andean Community** (*Comunidad Andina*, CAN) customs union that came into effect in 1988. CAN phased out all agricultural and industrial tariffs between members.

Colombia is also a founding member of the most recent regional initiative, the **Pacific Alliance** (*Alianza del Pacífico*), a trading block, formally launched in June 2012 to facilitate trade and investment with other regions (in particular with Asia-Pacific) and boost productivity. Under the Pacific Alliance, Colombia has agreed to remove some of the tariffs applied to agricultural products as of 2014; however, it will only gradually (up to 17 years depending on the partner country and product) eliminate other tariffs. Sugar will continue to be protected through the Andean Price Band System.

Colombia's FTA with **Mexico** began as the **Treaty of the Group of 3** (*Tratado del Grupo de los Tres*, TLC-G3), with Mexico and Venezuela, which entered into force in 1995. It provided a general tariff reduction scheme over a 10-year timeline for goods and services, excluding initially the products covered by the CAN price band, as well as banana, beans, coffee, pastry and bakery products, confectionery, tobacco, and cotton. In 2006, Venezuela withdrew from TLC-3G and the Agreement was adjusted in 2009 by Mexico and Colombia. The agreement includes a list of sensitive products for each country that is revised annually. A Working Group on Technical Standards of Agricultural Marketing reviews the implementation and effects of technical norms and marketing regulations affecting agricultural trade between the parties.

The **Partial Scope Agreement with Venezuela** entered into force in 2012. Colombia has duty-free market access in the Venezuelan market for about 400 agricultural tariff lines. Colombia maintains a list of 111 "sensitive" tariff lines, with duties between 0% and 33%. Colombia and Venezuela agree to restrain from introducing new non-tariff measures, while agricultural products have to comply with existing technical, sanitary and phytosanitary requirements.

Box 5.1. Agricultural elements of Colombia's trade agreements (cont.)

The chapters of the **Partial Scope Agreement on Trade and Economic and Technical Cooperation with CARICOM** entered in force between 1997 and 1999. It contains safeguard clauses for a wide range of products, consisting in a temporary application of the MFN tariff instead of the preferential duty. Colombia grants tariff reductions schedules for more than 200 agricultural tariff lines for all CARICOM members, while it receives preferential market access only from the more developed members of CARICOM for more than 1 000 tariff lines.

The FTA with **European Free Trade Area** (EFTA) countries was signed in 2008 but has so far been ratified only by Switzerland and Liechtenstein. Colombia will maintain the SAFP for maize, sorghum, soybeans, pigmeat and chicken meat. EFTA members will maintain their Price Compensation system. No safeguard provisions are included within the agreement.

The **Agreement of Economic Complementation** (*Acuerdo de Complementación Económica* No. 59, ACE) between CAN and MERCOSUR was signed in 2004 and entered in force in 2005. Colombia maintains the price band system, with the exception of wheat and barley. Tariffs for a wide range of products will be reduced within a 15-year timeline; sugar and its by-products were excluded from the tariff phase-out programme. For sensitive products such as meat and dairy, preferential access is granted for specified quotas, in such a way that does not affect production across CAN members. Safeguard clauses can be applied for a range of sensitive products.

The FTA with the **Central America Northern Triangle** was signed in 2007. It includes specific rules of origin covering meat products, sausages, coffee derivate products, sugar and confectionery.

The FTA with **Chile** entered into force in 2009. It was signed in 2006 as an additional protocol to the Agreement of Economic Complementation (*Acuerdo de Complementación Económica* No. 24, ACE) between Chile and Colombia, in force since 1993. Price band systems are maintained for pigmeat, poultry, dairy products, rice, maize, wheat and its by-products, oils, and sugar.

The FTA with **Canada** entered into force in 2011. Colombia preserves the application of the price band system for specific products. The agreement includes a safeguard clause for beef meat and beans. Nearly 98% of Colombia's agricultural products can enter the Canadian market duty-free. The dairy sector was not included in the negotiations. Colombia granted immediate duty-free access for most Canadian agricultural products, while other tariffs will be phased out within 5 or 10 years' time.

The FTA with the **United States** entered into force in 2012. This agreement stirred strong opposition among various stakeholders. The agreement eliminates Colombia's use of the Andean Price Bands (variable tariffs). Tariffs on 77% of all agricultural tariff lines were eliminated. Other tariffs will be eliminated within 15-19 years, including many within the first five years. As a general rule, virtually all tariffs will be reduced in equal annual instalments over the agreed phase-out period. For some products with longer tariff phase-outs, immediate duty-free market access was provided through the creation and annual expansion of TRQs. Annual TRQs grow at a compound rate for US agricultural exports. The agreement includes volume-based agricultural safeguards for beef meat, poultry cuts, beans and rice. Safeguard triggers are set as a percentage of the growing TRQ quantities. Increased tariffs resulting from the triggering of a safeguard can only be maintained for the remainder of the year they are invoked. The availability of using an agricultural safeguard

Box 5.1. Agricultural elements of Colombia's trade agreements (cont.)

expires when the tariff for that product has been phased out. The parties agreed not to use export subsidies on products shipped into each other's markets except to compete with third-party export subsidies. Under the agreement, most processed agricultural products will immediately enter Colombia duty free. All others will enter free of tariffs in ten years or less. For fruit and vegetables, Colombia obtained immediate market access, its sugar quota was tripled and a preferential quota was introduced for dairy products.

The FTA with the **European Union** entered into force in 2013. It provides Colombia new preferential market access for key agricultural products such as sugar, tobacco, flowers, palm oil, coffee, bananas and other fruits, beef meat animals. Sensitive agricultural products such as maize, rice, sorghum, soybeans, pigmeat and poultry were excluded from the tariff reduction process. Colombia is also entitled to protect the production of its agricultural goods through the application of flexible tariffs depending on export prices using a price band system. For oils, the SAFP will be dismantled within three years. There will a gradual reduction in tariffs for dairy, while a quota is granted for EU together with the possibility for Colombia to apply a safeguard clause. Colombia granted immediate duty-free market access to the EU for wheat, barley, olive oil, and prepared food stuffs. The Agreement prohibits any export subsidies on agricultural goods which are fully and immediately liberalised, or which are fully but not immediately liberalised.

Source: MADR (2013l); MinCIT (2012, 2013a, 2013b); OECD (2015).

The “Agricultural Export Bet 2006-20” (*Apuesta Exportadora Agropecuaria, AEA*) strategy led to the selection of promising agricultural export products and the identification of policy instruments necessary to increase the competitiveness of selected products. It sets goals for the size of the land to be cultivated under such crops and the yields to be achieved.

Regional and bilateral trade agreements

Colombia joined the WTO in 1995 as an original participant of the GATT and has commitments on market access, domestic support and export competition under the Uruguay Round Agreement on Agriculture (URAA). Colombia has supported the conclusion of the Doha Round, and is a member of several coalitions working to this end, including the Cairns group (which favours agricultural trade liberalisation), the “tropical products” group (seeking greater market access for tropical products) “the Friends of A-D negotiations” (FANs, which seeks more disciplines on the use of anti-dumping measures), and the Friends of Fish (FoFs, which seeks to reduce fisheries subsidies).

In addition, Colombia has participated in negotiations to deepen its bilateral and regional relationships and has signed new agreements (with Canada, EFTA, the United States, Korea, Panama and the European Union) to secure preferential access to strategic markets. Colombia is also currently negotiating free trade agreements with Japan and Turkey (Table 5.2) (WTO, 2012; MADR, 2013l).

Table 5.2. Trade agreements concluded or under negotiation by Colombia

Party	Type	Current status	Date of signature	Entry into force
Latin American Integration Association (ALADI)	Partial scope agreement	In force	12 August 1980	18 March 1981
Andean Community (CAN): Colombia, Ecuador, Peru, Bolivia (Venezuela withdrew in 2006)	Customs union	In force	12 May 1987	25 May 1988
Mexico	Free Trade and Economic Integration Agreement (includes investment chapter)	In force	11 June 1994	1 January 1995
CARICOM	Partial Scope Agreement on Trade and Economic and Technical Cooperation	In force	24 July 1994	1 January 1995; 1 June 1998; 1 January 1999
Andean Community – MERCOSUR	FTA	In force	18 October 2004	2005
United States	Free Trade and Economic Integration Agreement (includes investment chapter)	In force	22 November 2006	15 May 2012
Chile	Free Trade and Economic Integration Agreement (includes investment chapter)	In force	27 November 2006	8 May 2009
Central America Northern Triangle (Guatemala, Salvador and Honduras)	FTA (includes investment chapter)	In force	9 August 2007	Guatemala: 12 November 2009; El Salvador: February 2010; Honduras: 27 March 2010
Canada	FTA (includes investment chapter)	In force	21 November 2008	15 August 2011
EFTA (Switzerland, Norway, Iceland and Liechtenstein)	FTA (includes investment chapter)	Signed/in force	25 November 2008 (with all parties)	Switzerland and Liechtenstein: 26 November 2009
Venezuela	Partial scope agreement	In force	28 November 2011	19 October 2012
European Union	FTA (includes investment chapter)	In force	26 June 2012	1 August 2013
Pacific Alliance (Chile, Colombia, Peru, Mexico)	Free Trade and Economic Integration Framework Agreement (includes investment chapter)	Signed	6 June 2012	-
South Korea	FTA (includes investment chapter)	Signed	21 February 2013	-
Costa Rica	FTA	Signed	22 May 2013	-
Panama	FTA (includes investment chapter)	Signed	20 September 2013	-
Israel	FTA (includes investment chapter)	Signed	2 October 2013	-
Turkey	FTA (a separate BIT has been signed)	Under negotiation		
Japan	FTA (a separate BIT has been signed)	Under negotiation		

Note: ALADI is composed by Argentina, Bolivia, Brazil, Chile, Colombia, Cuba, Ecuador, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, and Venezuela. CARICOM is composed of Trinidad and Tobago, Jamaica, Barbados, Guyana, Antigua y Barbuda, Belize, Dominica, Granada, Monserrat, Saint Cristobal and Nieves, Saint Lucia, Saint Vincent and the Grenadines.

Source: WTO (2012); MinCIT (2013a, 2013b); MADR (2013l); OECD (2015).

Import policy measures

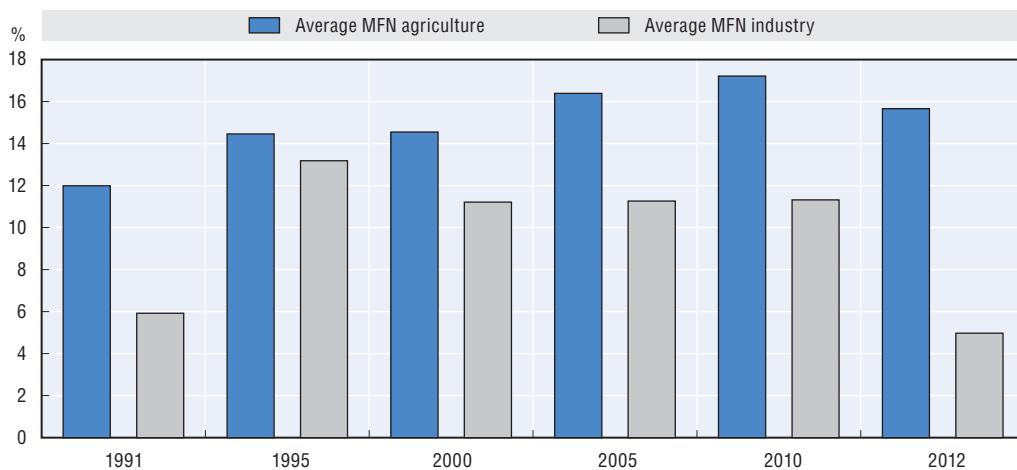
Most import quotas and licenses were eliminated in the early 1990s, and all tariffs were to be reduced gradually, although at a slower pace in agriculture. Price bands were instituted for a number of crops considered sensitive in order to smooth international price fluctuations before they were transmitted to the domestic market. Then the system was extended to additional agricultural commodities within the Andean Community.

Tariffs

As a member of the Andean Community, Colombia has been applying the Common External Tariff (CET) in effect since 1995, with certain exceptions. It uses the CAN Common Tariff Nomenclature (NANDINA), which is based on the Harmonised System (HS). Colombia only applies *ad valorem* tariffs, for which the duties are calculated on the basis of

the c.i.f. value of the goods in question (WTO, 2012). Tariffs applied in the agricultural sector have been much higher than in other sectors during the last two decades (Figure 5.5). The average MFN for agricultural products is 15.8% in 2012 compared to 5% for industrial goods (WITS, 2014).

Figure 5.5. MFN tariffs for agriculture versus industry, 1991-2012



Note: All simple averages are based on pre-aggregated HS six digit averages. Pre-aggregated means that duties at the tariff line level are first averaged to six digit subheadings. Subsequent calculations are based on these pre-aggregated averages. To the extent possible, non-*ad valorem* duties are converted into *ad valorem* equivalents.

Source: WITS Integrated Database (2014), <https://wits.worldbank.org/>.

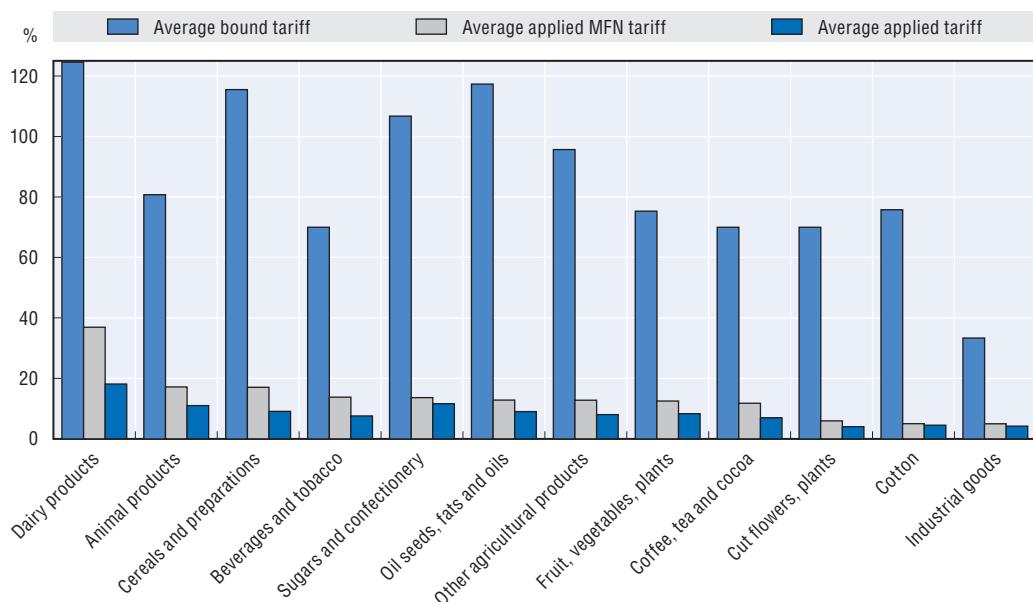
StatLink <http://dx.doi.org/10.1787/888933181807>

The highest MFN tariffs in 2012 were applied to the groups of dairy products, animal products, and cereals and preparations of cereals. Within the dairy products group, the highest MFN tariffs are being applied for five milk tariff headings (including milk powder) (98%) and whey (94%). Within the animal products group, a 94% MFN tariff is being applied for eleven bovine meat tariff lines. Within the group of cereals and preparations of cereals, a MFN tariff of 80% is being applied for husked (brown) rice and broken rice. Moreover, these products are included within the Andean Price Band System which has been applied since mid-1990s and essentially involves an application of an additional duty or a discount, depending on the level of international prices, on top of a basic *ad valorem* tariff established through the common external tariff policy of the Andean Community. This means that when international prices decrease *ceteris paribus*, import tariffs increase and vice versa (see following section). The year of application of the price band system saw applied MFN tariff for agriculture higher than in 1991 (Figure 5.6).

Fourteen per cent of agricultural MFN tariffs fall within the range of 0-5%. Most of the agricultural MFN tariffs (45%) fall within the range of 10-15%, while 3.4% of tariff lines are between 50-100%. Around 6.6% of agricultural imports enter through tariff lines paying duty of 0-5%, while the majority of imports (55%) pay 10-15% duties. Applied MFN tariffs are much lower than the bound rates (Figure 5.7).

The Andean Community Price Band System

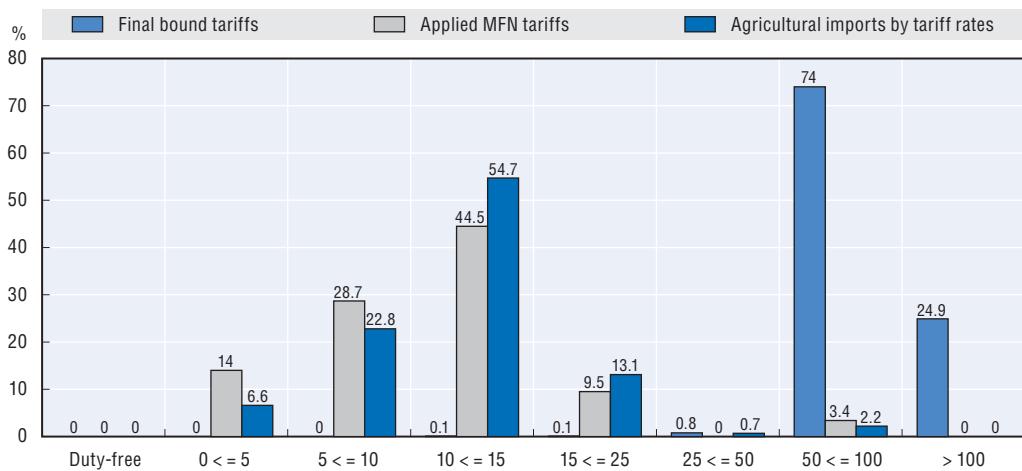
The Andean Price Band System (*Sistema Andina de Franja de Precios*, SAFP) aims to stabilise import prices for a specific group of agricultural products characterised by unstable international prices (WTO, 2012). The system establishes a floor price (lower band) and a

Figure 5.6. Average bound, MFN tariffs by product groups, 2012

Note: All simple averages are based on pre-aggregated HS six digit averages. Pre-aggregated means that duties at the tariff line level are first averaged to six digit subheadings. Subsequent calculations are based on these pre-aggregated averages. To the extent possible, non-ad valorem duties are converted into ad valorem equivalents. The groups of products are ordered in the decreasing order of applied MFN tariffs.

Source: WITS Integrated Database (2014), <https://wits.worldbank.org/>.

StatLink <http://dx.doi.org/10.1787/888933181813>

Figure 5.7. Frequency of distribution of agricultural bound and applied MFN tariff lines and imports by tariff rates, 2010

Source: WTO (2014), Tariff Profile of Colombia, <http://stat.wto.org/>.

StatLink <http://dx.doi.org/10.1787/888933181820>

ceiling price (higher band). When the international price is below the floor price, a special import duty is imposed, and when the international price exceeds the ceiling price, a tariff reduction is granted (Box 5.2). Tariffs resulting from the application of the SAFP cannot be higher than the bound tariffs established within the framework of WTO membership.

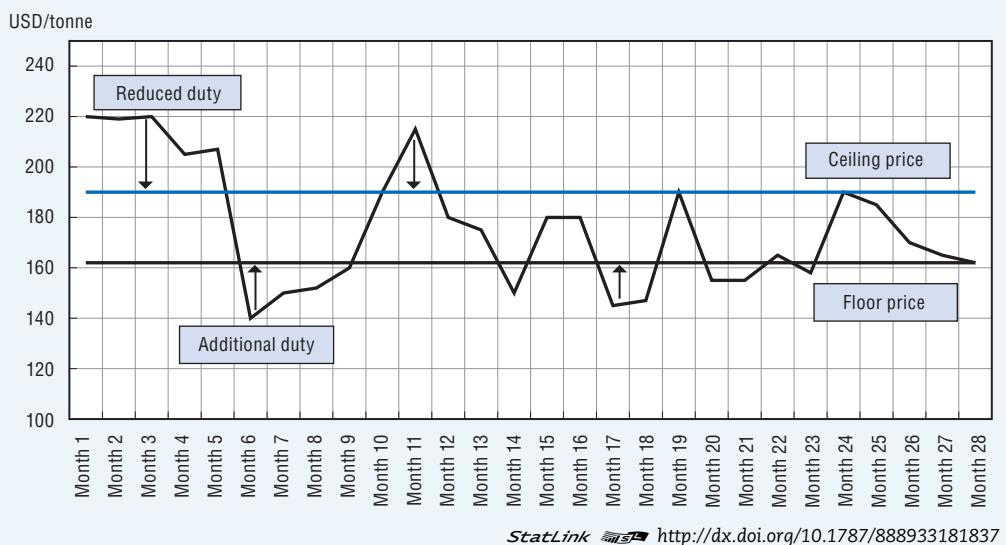
Box 5.2. Duty calculation under the Andean Price Band System

International prices for each of the 13 marker products are used to establish **reference prices** based on listings of the main stock exchanges trading these commodities around the world or f.o.b. prices of major exporters of such products (See Annex 5.A2 for more details).

The lower and higher bands are established based on a 60-month moving average of past real border prices, using real domestic monthly **c.i.f. prices** of the SAFP (deflated by the US Consumer Price Index) and a fixed proportion of the standard deviation of historical prices. The **c.i.f. price of the SAFP** is calculated based on the reference price plus estimated transport, insurance and any other costs that would be incurred were the product to be delivered at the Colombian border (before the payment of any import duties or other taxes on imports or trade and transport margins within the country).

The following rules apply for the calculation of the duty (Figure 5.8):

Figure 5.8. Operation of the SAFP mechanism



Extra duty:

$$\frac{(\text{Floor} - \text{CIF Price})}{\text{CIF Price}} * (1 + \text{Tariff})$$

Discount duty

$$\frac{(\text{CIF Price} - \text{Ceiling})}{\text{CIF Price}} * (1 + \text{Tariff})$$

- as long as the c.i.f. price is within the band created by floor and ceiling prices, only the basic *ad valorem* CET is applied as the variable duty is 0%;
- when the spot c.i.f. price is below the corresponding floor price, a variable duty is applied on top of the basic tariff, sufficient to raise the import cost to the floor price, which thus becomes the minimum import price;
- when the spot border price exceeds the ceiling price, the variable duty is not applied and instead a discount applies, mitigating the impact of price increase.

Box 5.2. Duty calculation under the Andean Price Band System (cont.)

The **SAFP application example** below shows how the price band is applied depending on the product c.i.f. price with respect to the established ceiling and floor prices (Table 5.3).

For “linked” products, the calculation of additional duty is done based on the reference price, floor and ceiling prices of the corresponding “marker” product. The same discount duty of the marker product is applied to the linked product when the reference price is above the ceiling price, and when the reference price is in between the floor and the ceiling prices there is no variable duty introduced.

Table 5.3. An example of the SAFP application

Marker product imported	Reference price	SAFP c.i.f. price (USD per tonne)	Ceiling price (USD per tonne)	Floor price (USD per tonne)	Variable duty	CAN tariff	Final duty
Soybeans	Based on transactions at the Chicago Stock Exchange	250	288	230	0%	15%	15% (15% + 0%)
Soybeans			Floor < SAFP c.i.f. < ceiling (230<250<288)				
Soybeans		245	248	301	1%	15%	16% (15% + 1%)
Soybeans			SAFP c.i.f. < floor < ceiling (245<248<301)				
Soybeans		583	481	555	5%	15%	10% (15% - 5%)
			Floor < ceiling < SAFP c.i.f. (481<555<583)				

In the case when the reference price is below the floor price, the variable duty for the “linked” product will depend on the relationship between the CETs of the linked ([l]) and marker products ([m]).

- if $CET[l] = CET[m]$ then additional duty[l] = additional duty [m];
- if $CET [l]$ is higher than $CET [m]$ then additional duty [r] is equal to the maximum between additional duty [m] * $AEC[m]/AEC[l]$ and additional duty [m] – ($AEC[l]-AEC[m]$);
- if $CET [l]$ is lower than $CET [m]$ then additional duty [r] is equal to the minimum between additional duty [m] * $AEC[m]/AEC[l]$ and additional duty [m] – ($AEC[l]-AEC[m]$).

Source: CAN (2013); MADR (2013m); MinCIT (2013a, 2013b); OECD (2015).

The price band system covers 13 marker products and their related products. The “marker” products are rice, barley, yellow maize, white maize, soya beans, wheat, unrefined soya bean oil, unrefined palm oil, unrefined sugar, refined sugar, milk, chicken cuts and pigmeat.

The introduction and application of the price band system arose owing to a reduction in harvested areas and diminishing yields for cereals and other short-cycle crops during the 1990s, which were seen as being directly correlated to the fast-track trade opening at the beginning of 1990. The system has continued through various waves of liberalisation during the last two decades and has the strong support of domestic farmers. However, forecasts for the medium and long-term suggest that international prices for dairy, meat, oilseeds are likely to remain high over the next decade, implying that the SAFP would not impose additional duties for a wide range of the products covered (OECD-FAO, 2014). Moreover, the effects of the SAFP on domestic prices are undergoing changes also indirectly. In some of its recent FTAs with important trading partners (e.g. Pacific Alliance and the United States), Colombia has agreed that the price band system will not apply. More generally, various in-quota-tariff provisions provide preferential access for products covered by SAFP in most of the FTAs.

Tariff rate quotas

Tariff rate quotas (TRQs) have also been negotiated in Colombia's FTAs, usually covering the same range of sensitive products. Import quotas are allocated through different mechanisms (Table 5.4). Import quotas have been distributed through the **Public Mechanism for the Agricultural Quota Administration** (*Mecanismo Público de Administración de Contingentes Agropecuarios*, MAC) for rice, white maize, yellow maize, beans, soybeans, sorghum, and cotton (MADR, 2013).

Table 5.4. Mechanisms for agricultural tariff rate quotas (TRQs) allocation

Mechanism for allocating import quotas	Products
The import quota is allocated on a competitive basis amongst participants registered with MADR. Quota allocation is by means of public auctions in which importers take part through the bid registration system: application of the Public Mechanism for the Agricultural Quota Administration (MAC).	Example: Yellow maize, white maize, rice, sorghum, beans, soybeans, cotton
The import quota is allocated amongst importers who participated in previous auctions (historical allocation), with a share reserved for new importers determined in accordance with the market situation.	Example: Beef
An import licence is required from the Import Committee of the Ministry of Trade, Industry and Tourism (MCIT), the criterion for approval being protection of the domestic industry.	Example: Poultry (cuts and offal, fresh or frozen)
The import quota is allocated to applicants on a <i>pro-rata</i> basis in accordance with their share of the total requests submitted to MADR.	Example: Whey, partially or fully demineralised

Source: WTO (2012); MADR (2013m).

The MAC provides the conditions for assigning the in-quota tariffs rates. This is set at a level below the tariff resulting from application of SAFP on products subject to this mechanism or below the MFN for other products subject to the MAC. The inter-institutional commission of the MAC counts on the participation of the Ministry of Finance, MinCIT and MADR; it meets at least once each semester and approves the quota with seasonal allocation and the Base Agricultural Auction Index (*Índice Base de Subasta Agropecuaria*, IBSA) reference (Decree 430 of 2004). Each year, MADR issued a decree listing the products subject to quotas, the volume and the intra-quota tariff¹ (MADR, 2013m). Since 2005, tariff quotas have been applied to a decreasing number of products, such that in 2012 Colombia established quotas for only four products.

In any case, most products subject to tariff quotas are also covered by the price band system. As a result, in 2011 the applied tariffs were zero in some cases because the imports entered the country at that 0% tariff rate. Moreover, in the case of white maize the SAFP was suspended in 2011 and the out-of-quota MFN tariff was applied. For other products (yellow maize and beans), although the price band system continues to be used, it was decided in 2011 that if the tariff calculated by the SAFP fell below the maximum tariff (5% in 2011), then the maximum tariff would be used. Furthermore, these tariff quotas cannot be applied in a way that is incompatible with FTAs that are currently in force (WTO, 2012; MADR, 2013m). Tariff rate quota allocations have been negotiated in the various FTAs signed by Colombia (Table 5.5). The principle of "**first come – first served**" for assigning TRQs was implemented in the FTA with the United States, meaning effectively that MAC is no longer operational.

Table 5.5. Tariff rate quotas (TRQs) for agricultural products in Colombia's FTAs

Trade agreement	Number of agricultural TRQs included	Products
Canada	5	Bovine meat cuts with bone, bovine meat cuts boneless, bovine offal, pork meat, beans
EFTA	3	Fresh cheese, melted cheese, other cheese
Mexico	10	Bovine meat, boneless; powder milk; butter; butter oil; cheese; wheat flour; wheat grains; soya oil; caramel (<i>arequipe</i>); beverages containing milk
Northern triangle	3	Animal feed (one opening for Guatemala and another for Honduras), ethyl alcohol
Andean community	1	Rice (quotas in place during 2009-10 also for yellow and white maize and soybeans)
United States	19	Bovine meat, bovine offal, chicken meat, chicken legs, powder milk, yoghurt, butter, cheese, processed dairy, ice-cream, beans, yellow maize, white maize, sorghum, glucose, pet food, animal feed, rice, crude soy oil
European Union	17	Sugar, bovine offal, livers and tongues, ice-cream, sugar syrups, whey, condensed milk, powder milk, baby milk, sugar confectionery, cheese, yoghurt
Mercosur	13	Fresh or frozen bovine meat, boneless bovine meat, bovine meat cuts boneless, bovine offal, milk and cream, sugar confectionery excluding cocoa, chocolate and other food preparations containing cocoa, milk in powder
Total	71	

Source: MADR (2013m).

Safeguard measures

Colombia has reserved the right to apply the special safeguard clause in the WTO Agreement on Agriculture to 57 four-digit tariff headings, but has not made use of this so far (WTO, 2012). Special Agricultural Safeguards (*Salvaguardias Especial Agricola*, SEAs) are included in trade agreements for specific products considered especially vulnerable to external competition (Table 5.6). This mechanism imposes an additional duty when imports exceed an established level (trigger), which then continues as long as is considered necessary to allow domestic producers to adjust (MADR, 2013b). During the period 1999-2012, Colombia made use of SEAs on five occasions, and then made use of SEAs five more times in 2013 alone, due mostly as a response to farmers' protests.

Table 5.6. Applied Special Agricultural Safeguards during 1999-2013

Products	Measure	Trade partner	Year of application
Rice	95 000 tonnes quota	Ecuador	1999
Rice	123 000 tonnes quota	CAN	2002
Rice	150 000 tonnes quota	CAN	2003
Oils and fats	29% tariff	CAN	2002
Sugar	35 000 tonnes quota	CAN	2004
Oils	6 267 tonnes quota	Argentina	2013
Oils	12 012 tonnes quota	Argentina	2013
Powdered milk	993 tonnes quota	Argentina	2013
Oils	21 tonnes quota	Brazil	2013
Oils	6 804 tonnes quota	Brazil	2013

Source: MADR (2013m).

Following the wave of farmers protests in the second half 2013, the Colombian government implemented a series of trade policy measures that affected elements of import duties, safeguards and tariff rate quotas (Box 5.3).

Box 5.3. Trade policy measures in light of 2013 farmers protests and the Agrarian Pact

The agricultural complaints during the 2013 waves of protests were relatively straightforward: low commodity prices due to import competition and high input costs. Criticism of FTAs already in force or under negotiation has been high and requests were made to renegotiate with “better terms for Colombian farmers”. In order to appease the protesters, the government committed to implement policies that would bolster and support domestic agricultural production.

The Agrarian Pact includes three primary trade policy instruments:

- Reducing **import duties** on agricultural inputs.
- Eliminating a general 3 000 tonnes **tariff rate quota** (TRQ) for whey protein dairy products from countries that do not have an ongoing trade agreement with Colombia.
- Reviewing and implementing **trade safeguards**.

As a result, in October 2013, the government published safeguard quotas for the next two years for CAN member countries Peru, Bolivia, and Ecuador, and for MERCOSUR members, primarily Argentina, Uruguay, and Brazil for the following products: fresh potatoes, pre-cooked and frozen potatoes, onions, dried beans, peas, tomatoes, pears, powder milk and other dairy products (Table 5.7). MERCOSUR and CAN dominate exports to Colombia for onions and whey protein, but their contributions to imports of other “sensitive” commodities are generally much smaller. These safeguard quotas are to be applicable for two years and be administered on a “first come, first served” basis.

Table 5.7. Safeguard quotas through Decree 2210 of 2013

Product	Safeguard quota Tonnes	Trading partner	MFN, %
Onions	102 392	CAN and MERCOSUR	15
Dried beans	23 323	CAN and MERCOSUR	60
Powder milk	1 644	CAN and MERCOSUR	98
Whey	4 698	CAN and MERCOSUR	94
Tomatoes	2 178	CAN and MERCOSUR	15
Peas	1 073	CAN and MERCOSUR	15
Fresh and pre-cooked potatoes	3 202	CAN and MERCOSUR	15
Pears	969	CAN and MERCOSUR	15
Fresh cheese	8	CAN and MERCOSUR	15

Overall, the government stands to continue its trade opening strategy and does not want to reverse in any way the momentum of the FTAs. The implementation of the Agrarian Pact was never intended to be a piecemeal quick fix with short-term accomplishments, but a longer-term policy strategy to address the deeper structural challenges facing rural Colombia. It does outline strong pillars for increasing the competitiveness of Colombian agricultural products.

Source: MADR (2014b); USDA GAIN (2014).

VAT rates and other duties on imports

A value-added tax (VAT), also known as “sales tax” in Colombia, is charged on the value of the imported products, including tariffs. There are three levels of VAT: 0% for products in the “daily basket”, 5% for certain agricultural products and services, and a general rate of 16% for the other products and services. VAT is applied at the general 16% rate for most agricultural products (MADR, 2013). Colombia also applies a consumption tax

to alcoholic beverages, imported cigarettes and tobacco products. The revenue obtained from the tax finances public healthcare services (WTO, 2012).

Import licensing

Colombia currently applies an automatic licensing system, referred to as “free importation”, and a non-automatic licensing system, known as “prior licensing”. Licences are required for all products. A prior or an automatic license is needed to import some agricultural goods subject to quota; goods subject to sanitary controls; and fishery resources. Any authorisation or permit required for goods to be imported, such as sanitary or phytosanitary certificates, must be obtained before applying for the import licence (WTO, 2012; USDA GAIN, 2014). Import licences can be applied for at any time of the year and must be processed online through the Single Window for trade system. At the present time, these licences (registrations) are issued within the space of one day and are valid for six months from the date of their issuance.

Standards and labelling

The Andean Community has adopted common procedures for issuing phyto and zoosanitary permits and certificates, together with rules for the registration, control, marketing and use of veterinary products. Members maintain common SPS requirements with respect to 31 agricultural products and most animals and their products. There are harmonised requirements and procedures for the registration and control of chemical pesticides for agricultural use.

The Colombian legislation currently uses four categories of standards and technical regulations, which are defined in Decree 2269 of 1993: Technical Standards (*Normas tecnicas*, NT), Colombian Technical Standard (*Normas tecnicas colombianas*, NTC), Sectoral Technical Standard (*Normas tecnicas sectoriales*, NTS) and Technical Regulations (*Regulaciones tecnicas*, RT) (WTO, 2012). ¹National Institute for the Surveillance of Food and Medicines (*Instituto Nacional de Vigilancia de Medicamentos y Alimentos*, INVIMA), an agency of the Ministry of Health and Social Protection (MHSP), and the Colombian Institute for Agriculture and Livestock (ICA), an agency of the Ministry of Agriculture and Rural Development (MADR) (USDA GAIN, 2014). Policy implementation is the task of the various institutes and agencies associated to the various Ministries, mainly ICA, INVIMA, the Supervisory Authority for Industry and Trade (*Superintendencia de Industria y Comercio*, SIC) and the National Institute of Health (*Instituto Nacional de Salud*, INS). Responsibility at national and local level for the operational work of sanitary surveillance and control, including at importation, is allocated to ICA as regards plant and animal health and to INVIMA with respect to public health and food safety. According to the government, Colombian SPS measures are generally aligned with international standards at least partially (OECD, 2015). ICA and INVIMA are each responsible for the issuance of import sanitary permits for different categories of agricultural products (Table 5.8). Non-processed products that are fresh or frozen require a sanitary permit only from ICA and do not need to be registered with INVIMA. ICA is also responsible for the issuance of import sanitary permits for agricultural inputs, including seeds.

In general, the ICA makes risk assessments of animal and plant species, products and by-products which form the subject of an import application by taking into account the

¹ Law 1122 of 2007 establishes the food and feed safety regulatory roles.

Table 5.8. Product groups covered by ICA and INVIMA when issuing import sanitary permits

Products	ICA	INVIMA
Bulk products	Wheat, maize, coarse grains, rice, soybeans, oilseeds, cotton, pulses etc.	Only products imported in bulk for repackaging for retail use without further processing
Intermediate products	Soybean meal, live animals, hides and skins, feeds and fodders, planting seeds	Soybean oil, animal fats, sugar, sweeteners
Consumer oriented products	Fresh fruit and vegetables, pet food	Meat and meat products, eggs, dairy products, processed fruit and vegetables, fruit and vegetable juices, confectionery products, prepared food, alcoholic and non-alcoholic beverages

Source: USDA GAIN (2014).

following: whether their importation has been previously authorised; whether they have been imported from the country of origin in the past; and whether the sanitary or phytosanitary situation has changed or new information has emerged concerning a disease or pest outbreak in the country of origin or in Colombia (ICA, 2013). As regards SPS issues, challenges cover both the formulation of related regulations and their implementation by concerned entities at the local level. Colombia's SPS system is not part of the National Quality System (*Sistema Nacional de Calidad, SNC*) and has not developed at the same pace as the various components of the SNC.

Temporary restrictions on imports (bans)

Colombia has banned the importation of live bovine animals and bovine products from countries that experienced cases of Bovine Spongiform Encephalopathy (BSE) (WTO, 2012). In 2009, Colombia banned poultry and poultry products from countries where an outbreak of avian influenza or Newcastle disease was reported or detected (WTO, 2012). In 2013, Colombia banned the importation of live crustaceans and raw, fresh, refrigerated and frozen crustacean products from countries affected by a disease known as early mortality syndrome (EMS) or acute hepatopancreatic necrosis (APHNS) for a period of one year. OECD (2015) has highlighted that Colombia's SPS standards associated to these import measures are stricter than those present in relevant international recommendations (e.g. World Organisation for Animal Health).

Export policy measures

Colombian exporters must be enrolled with the **Single Tax Register** (RUT). Coffee exporters must also make an annual application for enrolment in the **Register of Coffee Exporters** (WTO, 2012). Certain products require other documents, such as previous registrations or certificates of origin.

Export taxes and export subsidies

In general, Colombia does not levy export taxes or export subsidies. The exception to the export levy is the levy applied to coffee exports, which is used to finance the National Fund for Coffee. Colombia notified the WTO Committee on Agriculture that it had not subsidised agricultural exports between 2006 and 2010 (WTO, 2012).

Financial support mechanisms

In the past, Colombia has provided incentives for exporters, for example by creating incentive programmes for flowers and foliage, bananas, plantains, and prawns sectors in

2009 and creating hedging support programme for Colombian agricultural products in 2010 (USDA GAIN, 2013).

Exporters can also sometimes claim reimbursement for indirect taxes, charges, and other payments. Since 2006, this tax reimbursement programme has been used only in 2007, 2008 and 2011 for exports of certain products. For example, the CERT was used in 2011 to soften the negative impact of the revaluation of the peso.

Agribusiness Free Trade Zones

A Permanent Free Zone (*Zona Franca Permanente*, ZFP) is a delimited area of the national territory, where multiple industrial users of goods or services and commercial users may set up businesses. The Special Permanent Free Zone (*Zona Franca Permanente Especial*, ZFPE) is a regime that applies to a single industrial user whose business project is considered likely to have a significant impact on Colombia's economic and social development. The ZFPE regime is available to new industrial, agro-industrial, and services enterprises, port companies, and already established enterprises, provided they generate new investment (WTO, 2012). For agriculture projects, minimum criteria have to be met in terms of investment and job creation.

PROCOLOMBIA (Former PROEXPORT) is the entity responsible for **promoting exports**, foreign direct investment and tourism in Colombia. It is associated to the Ministry of Trade, Industry and Tourism (MinCIT), and thus designs and implements projects within the guidance of policies lead by the Ministry and assists on other responsibilities designated by the Presidency. PROCOLOMBIA has a worldwide network, with support offices across 21 countries. It also has eight regional offices across Colombia. PROCOLOMBIA offers support and comprehensive assistance to exporters through the following instruments (Proexport, 2013a, 2013b): 1) Identification of market opportunities, 2) Market intelligence, 3) Design of strategies for market penetration, 4) Support in the design of internationalisation action plans according to the requirements of foreign markets, 5) Organisation of seminars for opportunities dissemination, 6) Capacity building for exporters.

Summary

- Programmes implemented by MADR and its related entities are rather confusing in their design and objectives. The majority of programmes cover very broad and different areas and thus are implemented through a bundle of policy instruments, the impact of which can be difficult to measure and evaluate. The efficiency of budgetary resources allocation is therefore also hard to assess. Furthermore, there are no systematic evaluations of agricultural programmes impacts.
- The current description of the programmes being implemented does not appear sufficient for potential beneficiaries to have a full understanding of which instruments are more appropriate and in which way they can access them. An evaluation of the whole institutional offer is missing.
- Producer associations also implement MADR's programmes in parallel to implementing their own programmes; but there is not a clear assessment and disentanglement of the impact of this way of implementation.
- A considerable share of the budgetary allocation is increasingly directed to potentially production and trade distorting policy instruments, that is, direct payments based on output and input subsidies.

- In recent years, farmers have also been benefiting from debt rescheduling and sporadic write-offs, furthermore implicit credit from preferential interest rates from FINAGRO are also relevant.
- Economic liberalisation reforms were undertaken at the beginning of the 1990s. Furthermore, Colombia has signed and enforced several FTAs with key trading partners. Under these trade agreements, Colombia has committed to gradually phase out a wide range of agricultural border measures. Meanwhile, Colombia continues to use the Andean Price Band System as well as other border measures such as tariffs and safeguards for major agricultural products.
- As regards SPS issues, entities at the national and local levels face important challenges in the formulation of regulations and their implementation.

ANNEX 5.A1

Taxes on agricultural products

Table 5.A1.1. Examples of agricultural products under VAT

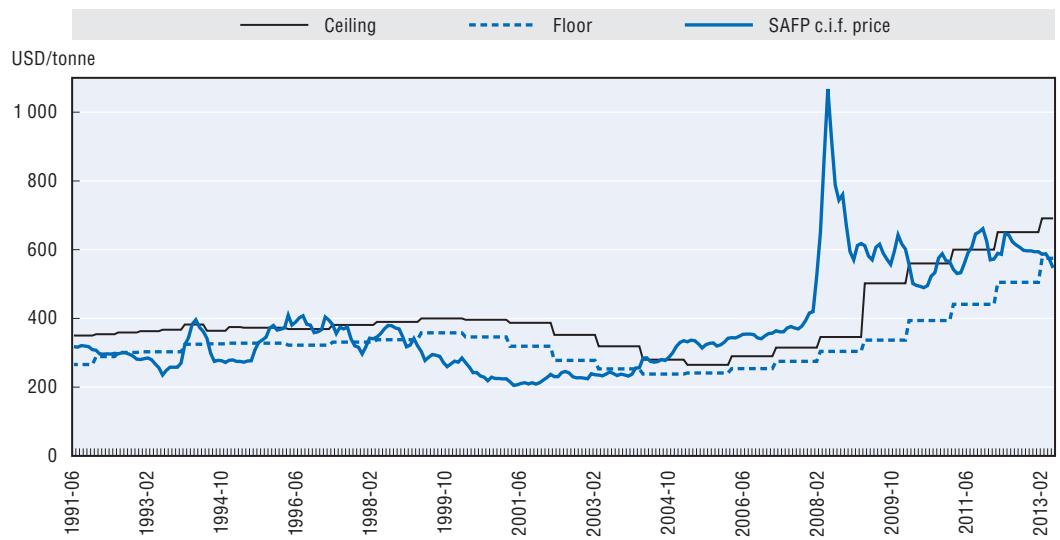
Agricultural goods excluded	Agricultural goods exempt	Agricultural goods subject to 5% VAT
Live animals (sheep and goats)	Bovine meat, fresh or chilled	Rye
Live animals (pigs)	Poultry	Oat
Milk products	Eggs	Maize for feed use
Potatoes (fresh or frozen)	Fresh cheese	Cotton seed
Bananas including plantains, fresh or dried	Meat and edible offal of poultry	Palm nuts and kernels
Total of products included in this category: 74	Total of products included in this category: 25	Total of products included in this category: 43

Source: MADR (2013).

ANNEX 5.A2

*Products covered by the ANDEAN community
price band system (SAFP): Ceiling,
floor and SAFP-c.i.f.-prices, 1996-2013*

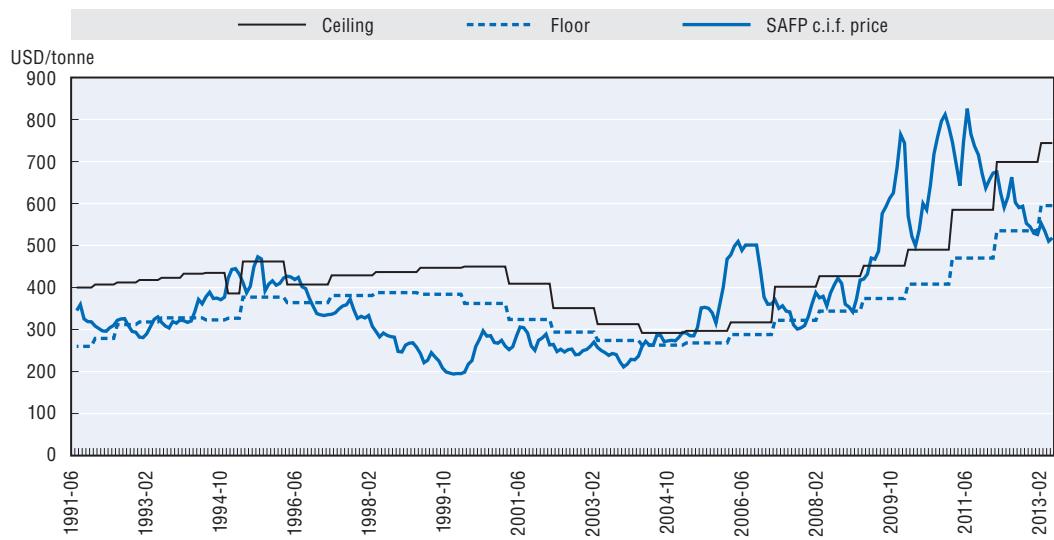
Figure 5.A2.1. Rice



Source: MADR (2014a).

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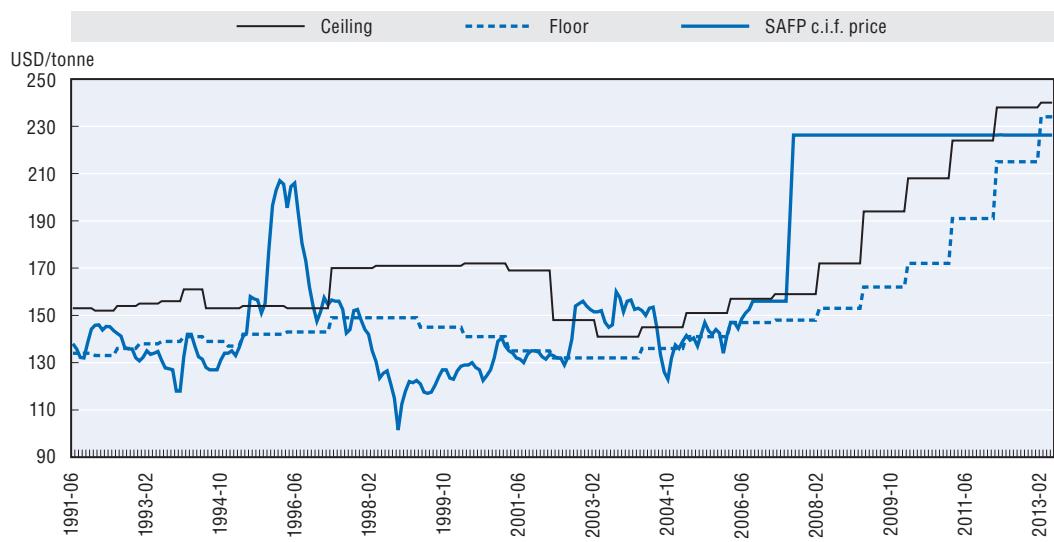
Figure 5.A2.2. **White sugar**



Source: MADR (2014a).

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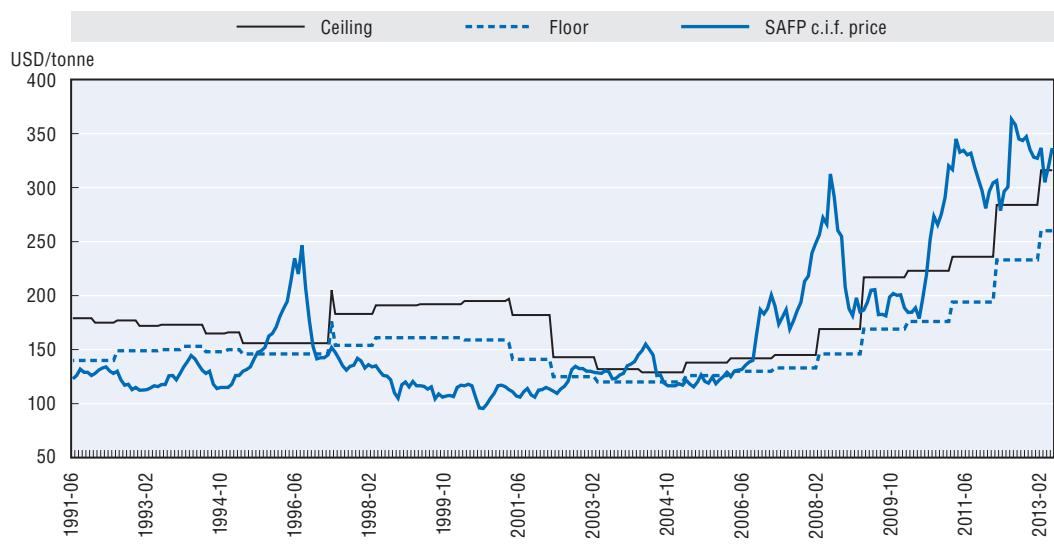
Figure 5.A2.3. **Barley**



Source: MADR (2014a).

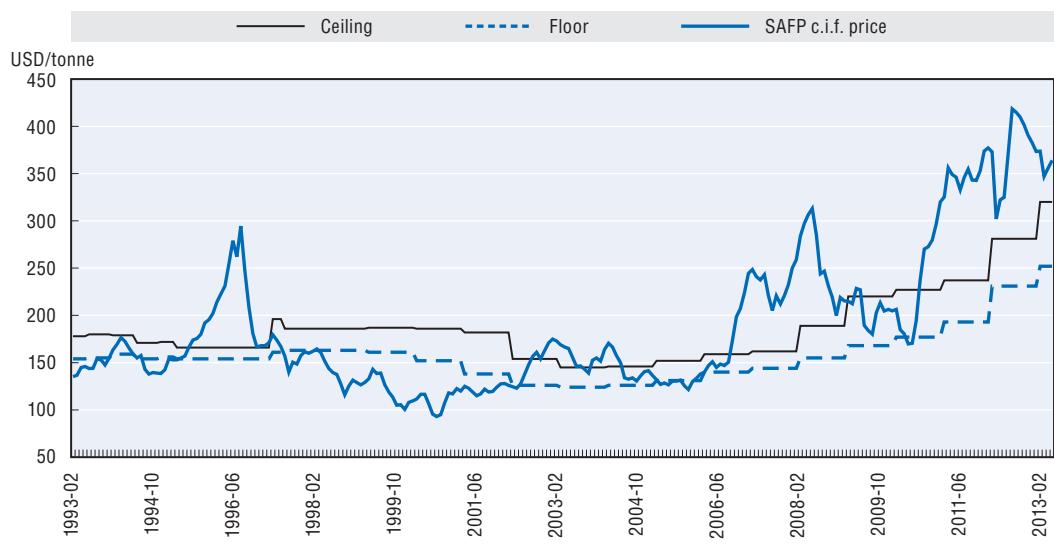
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Figure 5.A2.4. Yellow maize



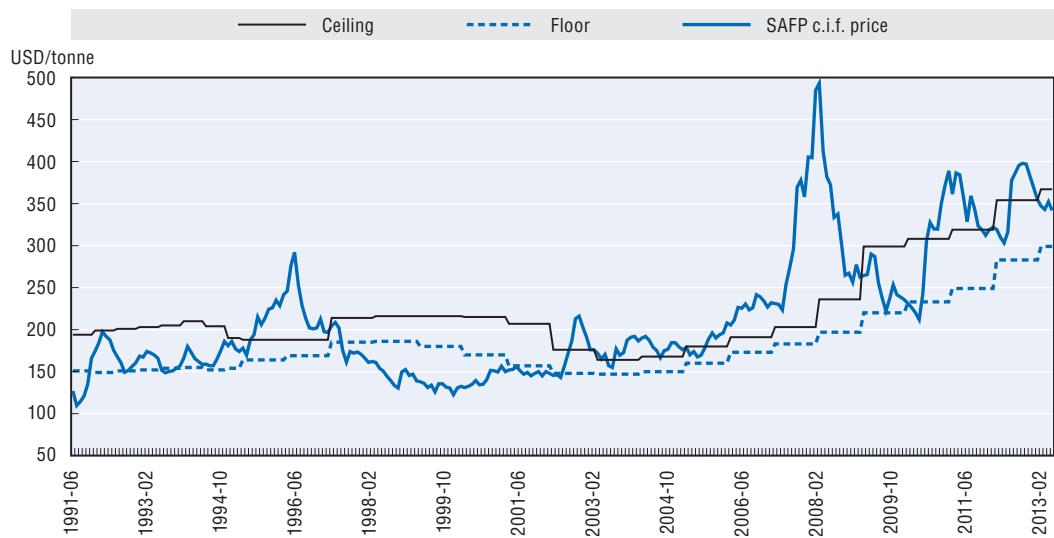
StatLink <http://dx.doi.org/10.1787/888933181874>

Figure 5.A2.5. White maize



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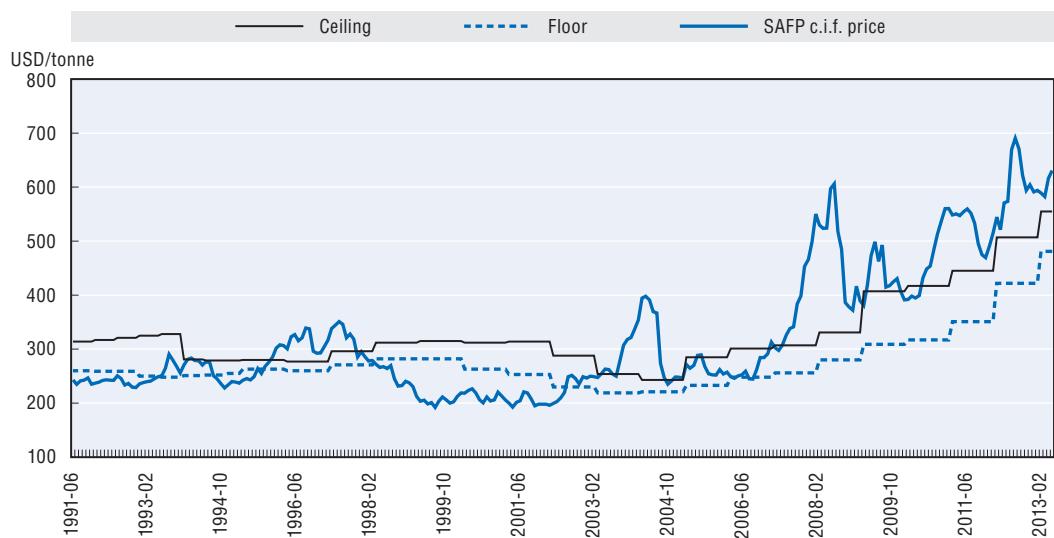
Figure 5.A2.6. Wheat



Source: MADR (2014a).

StatLink <http://dx.doi.org/10.1787/888933181894>

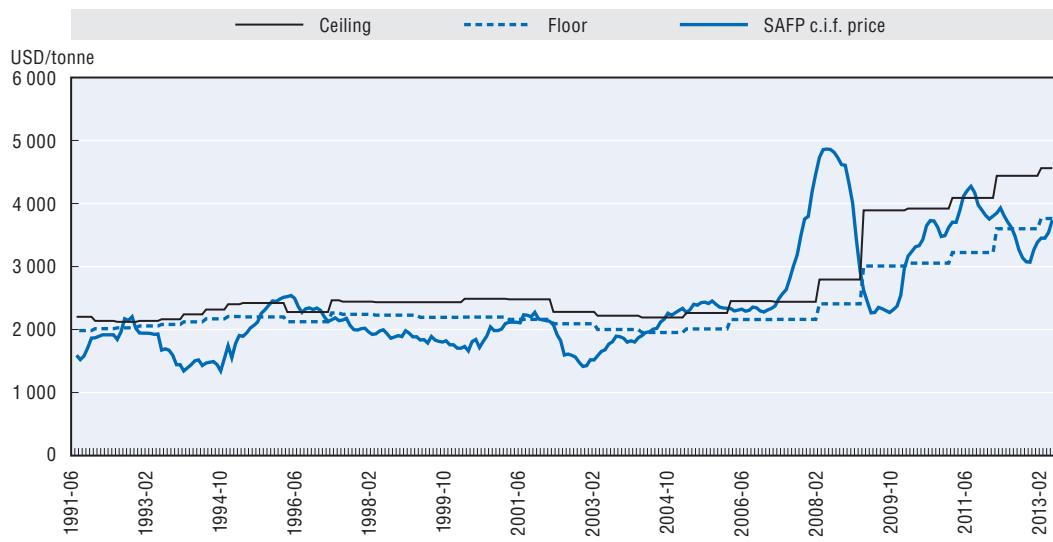
Figure 5.A2.7. Soybeans



Source: MADR (2014a).

StatLink <http://dx.doi.org/10.1787/888933181902>

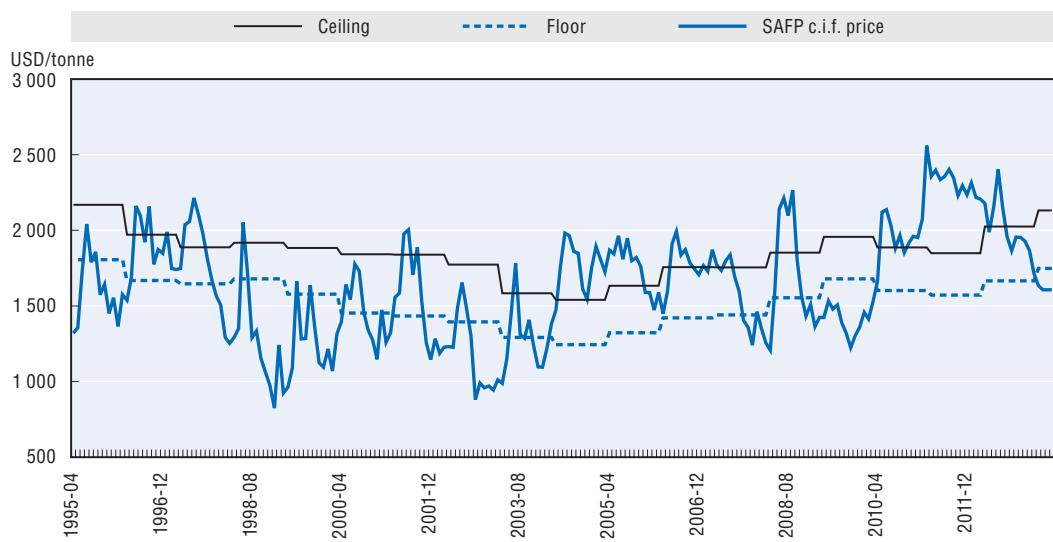
Figure 5.A2.8. Milk



Source: MADR (2014a).

StatLink <http://dx.doi.org/10.1787/888933181913>

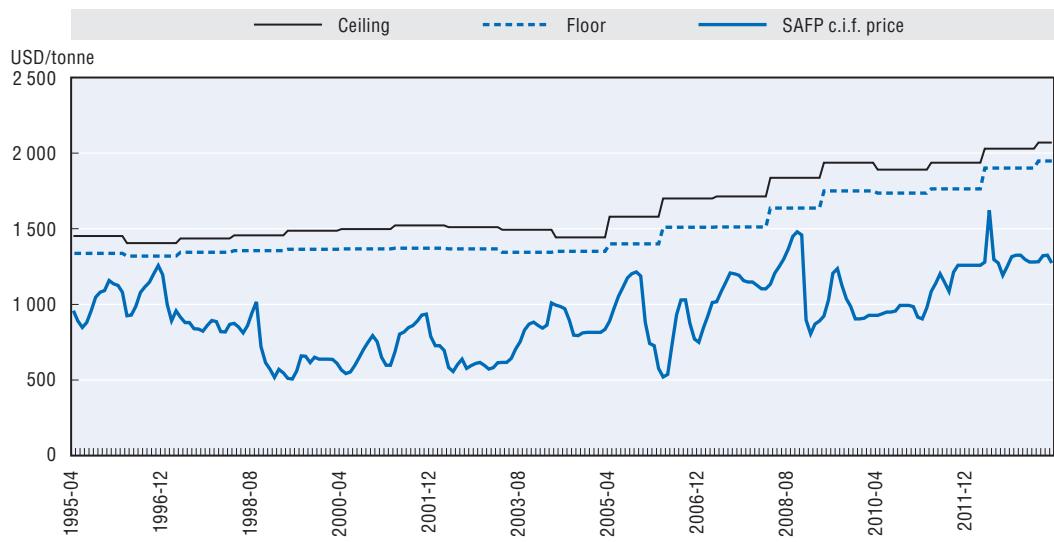
Figure 5.A2.9. Pigmeat



Source: MADR (2014a).

StatLink <http://dx.doi.org/10.1787/888933181922>

Figure 5.A2.10. **Chicken cuts**



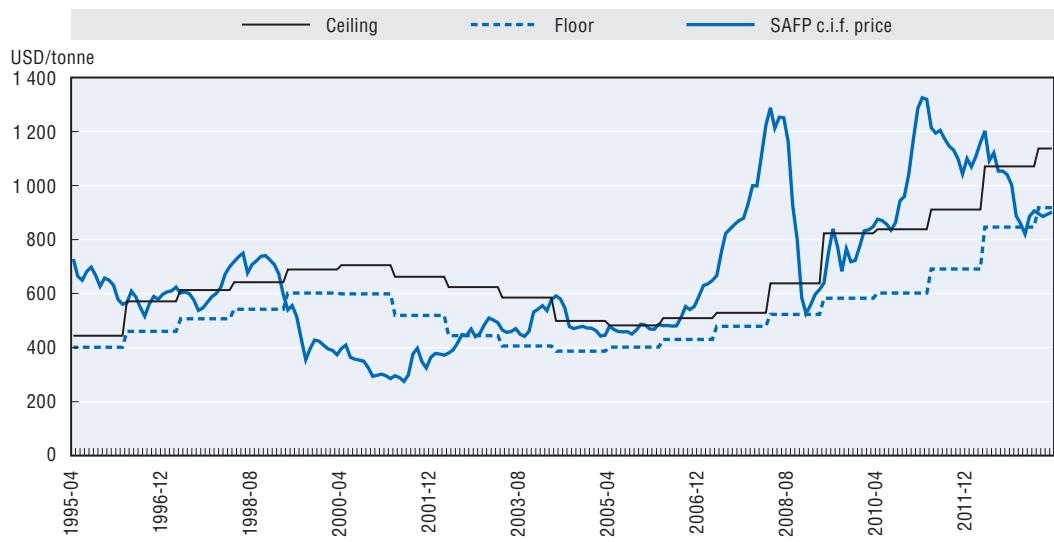
StatLink <http://dx.doi.org/10.1787/888933181936>

Figure 5.A2.11. **Soya oil**



StatLink <http://dx.doi.org/10.1787/888933181948>

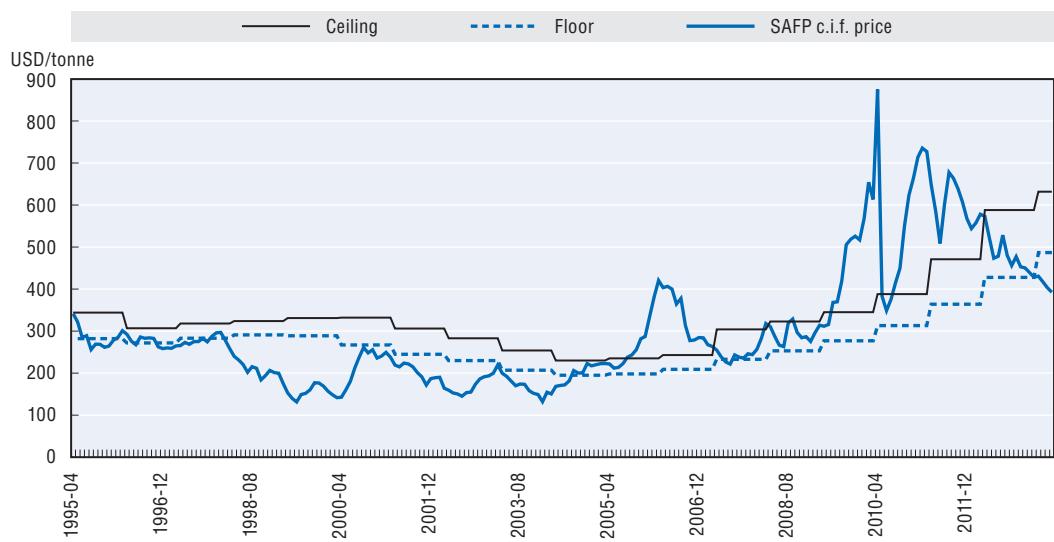
Figure 5.A2.12. Palm oil



Source: MADR (2014a).

StatLink <http://dx.doi.org/10.1787/888933181958>

Figure 5.A2.13. Raw sugar



Source: MADR (2014a).

StatLink <http://dx.doi.org/10.1787/888933181961>

Note

1. The most recent Decrees are: Decree 2333 of 2008, Decrees 4676, 760 and 4551 of 2009, Decrees 140, 2770 and 4662 of 2010, Decree 4900 of 2011.

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PART II

Chapter 6

Evaluation of Colombia's support to agriculture

This chapter examines the support provided to agricultural producers in Colombia for the period 1992-2013. The Producer Support Estimate (PSE) components – market price support and budgetary transfers – are calculated for 1992-2013. The chapter looks at the evolution of producer support over this period in parallel to an analysis of general services provided for the agricultural sector, such as infrastructure, agricultural knowledge and agricultural knowledge transfer, or farm restructuring. Colombia's %PSE for the period 2011-13 is estimated at 19%, ranking slightly above the OECD average (18%) and indicating that almost a fifth of gross receipts of agricultural producers is generated by support policies. This support has not substantially changed during the period covered. Market price support (MPS) has been the main component of producer support, accounting for 81% of the PSE in 2011-13. The analysis identifies the support provided to individual crops and livestock products, contributing to 76% of the value of agricultural production, including coffee, rice, maize, poultry, sugar, milk, beef and pigmeat.

Support to agricultural producers

A quantitative evaluation of support provided to Colombian agriculture from 1992 to 2013 is performed. This evaluation is based on the indicators of agricultural support developed by the OECD. These measures include the Producer Support Estimate (PSE), Consumer Support Estimate (CSE), Total Support Estimate (TSE), General Services Support Estimate (GSSE), and others. Box 6.1 contains detailed definitions of these indicators.

Box 6.1. OECD indicators of support to agriculture

INDICATORS OF SUPPORT FOR PRODUCERS

Producer Support Estimate (PSE): the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on farm production or income.

Percentage PSE (%PSE): PSE as a share of gross farm receipts (including support).

Producer Nominal Assistance Coefficient (producer NAC): the ratio between the value of gross farm receipts (including support) and gross farm receipts valued at border prices (measured at farm gate).

Producer Nominal Protection Coefficient (producer NPC): the ratio between the average price received by producers at farm gate (including payments per tonne of current output), and the border price (measured at farm gate). The NPC is also available by commodity.

Producer Single Commodity Transfers (producer SCT): the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policy measures directly linked to the production of a single commodity such that the producer must produce the designated commodity in order to receive the transfer.

Producer Percentage Single Commodity Transfers (producer %SCT): the commodity SCT as a share of gross farm receipts for the specific commodity.

INDICATORS OF SUPPORT TO CONSUMERS

Consumer Support Estimate (CSE): the annual monetary value of gross transfers from (to) consumers of agricultural commodities, measured at the farm gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on consumption of farm products.

Percentage CSE (%CSE): CSE as a share of consumption expenditure (measured at farm gate) net of taxpayer transfers to consumers.

Consumer Nominal Assistance Coefficient (consumer NAC): the ratio between the value of consumption expenditure on agricultural commodities (at farm gate) and that valued at border prices (measured at farm gate).

Box 6.1. OECD indicators of support to agriculture (cont.)

Consumer Nominal Protection Coefficient (consumer NPC): the ratio between the average price paid by consumers (at farm gate) and the border price (measured at farm gate).

Consumer Single Commodity Transfers (consumer SCT): the annual monetary value of gross transfers from (to) consumers of agricultural commodities, measured at the farm gate level, arising from policy measures directly linked to the production of a single commodity.

INDICATORS OF SUPPORT TO GENERAL SERVICES FOR AGRICULTURE

General Services Support Estimate (GSSE): the annual monetary value of gross transfers to general services provided to agricultural producers collectively (such as research, development, training, inspection, marketing and promotion), arising from policy measures that support agriculture regardless of their nature, objectives and impacts on farm production, income, or consumption. The GSSE does not include any transfers to individual producers.

Percentage GSSE (%GSSE): GSSE as a share of Total Support Estimate (TSE).

INDICATORS OF TOTAL SUPPORT TO AGRICULTURE

Total Support Estimate (TSE): the annual monetary value of all gross transfers from taxpayers and consumers arising from policy measures that support agriculture, net of associated budgetary receipts, regardless of their objectives and impacts on farm production and income, or consumption of farm products.

Percentage TSE (%TSE): TSE as a share of GDP.

A detailed description of the OECD methodology to estimate agricultural support (the “PSE Manual”), and a comprehensive database for OECD and selected non-OECD countries are available at www.oecd.org/tad/support/psecse. The methodology applied in this study is fully consistent with that used for other countries as presented in OECD reports that monitor and evaluate agricultural policies.

A detailed description of the methodology applied by the OECD to estimate agricultural support (the “PSE Manual”), as well as comprehensive databases for OECD countries and a number of non-OECD countries are available from www.oecd.org/tad/support/psecse. The methodology applied in this study is fully consistent with that used for other countries as presented in OECD reports that monitor and evaluate agricultural policies (OECD, 2014). Box 6.2 provides basic information on how this methodology has been applied in the case of Colombia.

The percentage **Producer Support Estimate (%PSE)** is the OECD’s key indicator to measure support to agricultural producers. It expresses the monetary value of support transfers to agricultural producers as a percentage of producer gross receipts. As it is not affected by inflation or the size of the sector it allows comparisons in the level of support to be made over time and between countries. This indicator provides insights into the burden that agricultural support policies place on consumers (i.e. market price support) and taxpayers (budgetary transfers). Estimations suggest that variations in the level of support in Colombia are mostly driven by changes in market price support (MPS) and not so much by changes in budgetary allocations because the MPS dominates the PSE. Nevertheless, such allocations have increased over the past few years. Budgetary support

Box 6.2. Colombia's PSE calculation

Broadly speaking, the PSE has two main components: market price support and budgetary allocations.

1) Market Price Support

Market price support (MPS) is based on the measurement of the gap between a country's domestic prices and international prices. This price gap results from a variety of policy measures that prevent domestic prices from aligning with international levels. These policies include trade measures, such as import tariffs, import quotas, tariff quotas, SPS regime, export subsidies, export taxes, as well as quantitative restrictions on exports. Policies creating a price gap also include domestic measures, such as administered pricing, market interventions, or public stockholding. In emerging and developing economies the gaps between domestic and international prices are also explained by factors that are not strictly policy-related, e.g. deficiencies in physical infrastructure, inadequate information and weak market institutions. Market price support is financed by consumers through higher prices. For the case of Colombia the MPS is calculated with the following information:

Period covered: 1992-2013

Products covered: Rice, maize, sugar, coffee, palm oil, plantains, bananas, cut flowers, milk, beef, pigmeat, poultry, and eggs (see Annex 6.A1 for more details about these products). These 13 commodities account for 76% of the total value of gross agricultural output (GAO) in Colombia during the period 1992-2013. The eight crops accounted for 65% of the value of total crop production in 2012, the five livestock products represented on average 96% of total livestock production for the same year. For the purpose of the PSE estimations six products are treated as net export (X): sugar, coffee, palm oil, bananas, cut flowers and to a lesser extent plantains which have a small volume of trade; four products are treated as net import (M): rice, maize, pigmeat and poultry; for the remaining products: milk, beef, and eggs are considered non-internationally traded.

Producer prices: Average prices received by producers at farm gate level, except for sugar for which wholesale prices were used. This information has been provided by MADR-AGRONET sourced from DANE-SIPSA-EVA and farmer associations.

External reference prices: Average export unit values registered at the border were used for sugar, coffee, palm oil, bananas, cut flowers and plantains and sourced by DANE. For rice and maize average import unit values at the border were also used. Import unit values for pigmeat and poultry were not sufficiently consistent across the period which prompted the use of USA producer price adjusted (added) by international transportation costs from the USA to Colombia. International trade for beef, eggs and milk (skim milk powder and butter) is very small and does not generate reliable trade unit values. Therefore, for eggs USA producer prices were used, for beef Brazil's producer prices were used, and both prices were adjusted by international transportation costs to Colombia. Lastly, for milk the reference price was USA border prices (export unit values) for both butter and skim milk powder.

Box 6.2. Colombia's PSE calculation (cont.)

Marketing margins: Marketing margins are estimations of processing, handling and transportation costs for a given commodity. Marketing margin adjustment to the reference prices is required to make those prices comparable with domestic prices measured at the farm gate. For most of the products margins were expressed as a percentage of the farm gate prices. For a few products registered data on processing and transportation costs were used, as well as the difference between the farm gate and the wholesale price, ensuring that prices were expressed in the same weight terms. These margins estimations were given by MADR-CADENAS calculated using data from processors, traders and farmer associations. For products where farm gate producer prices of other countries were used as the reference prices (pigmeat, beef, poultry, and eggs) no margin adjustments were made except for international transport costs and the deduction of transportation cost from border to wholesale. For milk, the processing margin of butter and SMP from one tonne of raw milk is an average margin of four major milk exporters Australia, New Zealand, the European Union and the United States.

Price gap estimates. The “zero price gap” assumption for exported products like flowers and bananas was used, as no relevant policy like export subsidies is in place. For palm oil, plantains, and beef the price gap was set to zero when negative gaps were obtained, as the estimated negative price gaps reflects factors other than agricultural policies. For coffee the price gap was also set to zero when negatives were found. For eggs, the annual average tariff rate was used to estimate the price gap for the period 2007-13. The price gap for maize was calculated with a weighted average of yellow and white maize.

2) Budgetary Support

Budgetary support originates from government revenues. Budgetary information for 1990-2013 was provided by DNP and covers federal budgetary expenditure undertaken by MADR and several other ministries and agencies like the Ministry of Environment, and Sustained Development Ministry of Transport, Ministry of Education, SENA, INVIAS. It does not include budgetary allocation at the departmental or municipal levels. The implicit subsidy arising from preferential credit interest rates is also estimated.

was very low until the second half of the 2000s, and accounted for only a small share of producer support, but became more important in the second half of the 2000s. Colombia's %PSE for the period 2011-13 is estimated at 19%, indicating that almost a fifth of gross receipts of agricultural producers is generated by support policies (Figure 6.1 and Tables 6.1 and 6.2).

Colombia's PSE indicator has been more or less constant during the period 1992-13 (around 20%), except for the 2003-04 period, when support fell significantly owing to strong exchange rate depreciation. Support is predominantly given through market price support (MPS). However, since 2007 there has been a clear trend towards increasing levels of budgetary support to the sector, particularly for 2013 when outlays more than doubled.

Colombia's aggregate level of support (%PSE) is slightly above the OECD average (Figure 6.2). Colombia's PSE in 2011-13 was close to that of Turkey (19%), EU27 (19%) and Indonesia (19%), but much lower than that of highly protected agricultural sectors such as those of Japan (54%) or Norway (57%).

Table 6.1. Estimates of support to agriculture in Colombia, COP million

	1992-94	1999-2001	2005-07	2011-13	2011	2012	2013p
Total value of production (at farm gate)	8 866 128	22 569 855	37 096 333	50 525 176	49 844 000	49 696 000	52 037 529
of which share of MPS commodities (%)	67	79	77	78	78	78	77
Total value of consumption (at farm gate)	6 220 873	17 183 115	29 018 664	43 542 311	40 342 923	44 122 956	46 161 054
Producer Support Estimate (PSE)	1 719 150	4 893 890	6 336 932	10 204 126	8 738 158	10 854 466	11 019 754
Support based on commodity output	1 614 709	4 666 430	5 643 909	8 739 344	7 733 995	9 405 627	9 078 410
Market Price Support ¹	1 613 909	4 666 430	5 634 375	8 206 863	7 715 995	9 337 507	7 567 087
Payments based on output	800	0	9 533	532 481	18 000	68 120	1 511 323
Payments based on input use	104 236	227 460	693 023	1 378 221	1 004 163	1 448 838	1 681 662
Based on variable input use	80 474	189 925	420 158	1 076 634	870 197	1 072 552	1 287 154
with input constraints	69 980	172 177	245 025	701 133	483 810	599 248	1 020 342
Based on fixed capital formation	9 706	23 357	145 220	186 269	70 766	244 544	243 496
with input constraints	2 858	2 554	86 421	72 925	34 233	68 829	115 712
Based on on-farm services	14 057	14 179	127 645	115 318	63 200	131 743	151 012
with input constraints	0	800	69 513	45 876	26 667	47 404	63 557
Payments based on current A/An/R/I, production required	205	0	0	86 561	0	0	259 682
Based on Receipts/Income	0	0	0	0	0	0	0
Based on Area planted/Animal numbers	205	0	0	86 561	0	0	259 682
with input constraints	205	0	0	86 561	0	0	259 682
Payments based on non-current A/An/R/I, production required	0	0	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	0	0	0	0	0	0	0
With variable payment rates	0	0	0	0	0	0	0
with commodity exceptions	0	0	0	0	0	0	0
With fixed payment rates	0	0	0	0	0	0	0
with commodity exceptions	0	0	0	0	0	0	0
Payments based on non-commodity criteria	0	0	0	0	0	0	0
Based on long-term resource retirement	0	0	0	0	0	0	0
Based on a specific non-commodity output	0	0	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0	0	0
Miscellaneous payments	0	0	0	0	0	0	0
Percentage PSE (%)	19	22	17	19	17	21	20
Producer NPC (coeff.)	1.19	1.25	1.17	1.20	1.17	1.23	1.21
Producer NAC (coeff.)	1.24	1.27	1.20	1.24	1.21	1.27	1.25
General Services Support Estimate (GSSE)	194 298	309 130	658 204	1 777 634	1 346 953	1 847 596	2 138 354
Agricultural knowledge and innovation system	40 214	93 894	163 279	398 944	413 956	404 313	378 562
Inspection and control	11 973	19 152	42 977	115 048	86 960	104 413	153 772
Development and maintenance of infrastructure	142 111	194 431	451 948	1 258 066	846 037	1 330 381	1 597 780
Marketing and promotion	0	0	0	5 576	0	8 490	8 239
Cost of public stockholding	0	0	0	0	0	0	0
Miscellaneous	0	1 653	0	0	0	0	0
Percentage GSSE (% of TSE)	10.3	5.9	9.4	14.7	13.4	14.5	16.3
Consumer Support Estimate (CSE)	-1 421 934	-4 379 416	-5 935 354	-8 858 142	-8 161 509	-10 034 686	-8 378 233
Transfers to producers from consumers	-1 356 386	-3 914 938	-5 019 914	-7 907 228	-7 077 890	-9 224 327	-7 419 468
Other transfers from consumers	-73 749	-485 949	-962 989	-988 002	-1 135 320	-840 182	-988 505
Transfers to consumers from taxpayers	0	0	0	0	0	0	0
Excess feed cost	8 200	21 472	47 549	37 089	51 701	29 824	29 740
Percentage CSE (%)	-22	-26	-21	-20	-20	-23	-18
Consumer NPC (coeff.)	1.29	1.35	1.26	1.26	1.26	1.30	1.22
Consumer NAC (coeff.)	1.29	1.35	1.26	1.26	1.25	1.29	1.22
Total Support Estimate (TSE)	1 913 449	5 203 020	6 995 136	11 981 760	10 085 111	12 702 062	13 158 107
Transfers from consumers	1 430 135	4 400 888	5 982 903	8 895 231	8 213 210	10 064 510	8 407 973
Transfers from taxpayers	557 063	1 288 081	1 975 222	4 074 532	3 007 221	3 477 735	5 738 639
Budget revenues	-73 749	-485 949	-962 989	-988 002	-1 135 320	-840 182	-988 505
Percentage TSE (% of GDP)	3.14	2.56	1.83	1.80	1.62	1.91	1.88
GDP deflator (1995-97 = 100)	53	186	285	375	370	380	n.a.

p: provisional, n.a.: not available.

NPC: Nominal Protection Coefficient.

NAC: Nominal Assistance Coefficient.

A (area planted), An (animal numbers), R (receipts), I (income).

1. MPS commodities for Colombia are: rice, maize, sugar, coffee, palm oil, plantains, bananas, cut flowers, milk, beef, pigmeat, poultry meat and eggs. Market Price Support is net of producer levies and Excess feed cost.

Source: OECD, PSE/CSE Database (2014a).

StatLink  <http://dx.doi.org/10.1787/888933181989>

Table 6.2. Estimates of support to agriculture in Colombia, USD million

	1992-94	1999-2001	2005-07	2011-13	2011	2012	2013p
Total value of production (at farm gate)	11 525	11 105	16 571	27 482	26 969	27 635	27 842
of which share of MPS commodities (%)	67	79	77	78	78	78	77
Total value of consumption (at farm gate)	8 065	8 442	12 981	23 688	21 829	24 537	24 698
Producer Support Estimate (PSE)	2 240	2 425	2 835	5 553	4 728	6 036	5 896
Support based on commodity output	2 105	2 313	2 522	4 758	4 185	5 230	4 857
Market Price Support ¹	2 104	2 313	2 518	4 472	4 175	5 193	4 049
Payments based on output	1	0	4	285	10	38	809
Payments based on input use	135	112	314	750	543	806	900
Based on variable input use	104	93	192	585	471	596	689
with input constraints	91	85	110	380	262	333	546
Based on fixed capital formation	12	12	65	102	38	136	130
with input constraints	4	1	39	40	19	38	62
Based on on-farm services	18	7	57	63	34	73	81
with input constraints	0	0	31	25	14	26	34
Payments based on current A/An/R/I, production required	0	0	0	46	0	0	139
Based on Receipts/Income	0	0	0	0	0	0	0
Based on Area planted/Animal numbers	0	0	0	46	0	0	139
with input constraints	0	0	0	46	0	0	139
Payments based on non-current A/An/R/I, production required	0	0	0	0	0	0	0
Payments based on non-current A/An/R/I, production not required	0	0	0	0	0	0	0
With variable payment rates	0	0	0	0	0	0	0
with commodity exceptions	0	0	0	0	0	0	0
With fixed payment rates	0	0	0	0	0	0	0
with commodity exceptions	0	0	0	0	0	0	0
Payments based on non-commodity criteria	0	0	0	0	0	0	0
Based on long-term resource retirement	0	0	0	0	0	0	0
Based on a specific non-commodity output	0	0	0	0	0	0	0
Based on other non-commodity criteria	0	0	0	0	0	0	0
Miscellaneous payments	0	0	0	0	0	0	0
Percentage PSE (%)	19	22	17	19	17	21	20
Producer NPC (coeff.)	1.19	1.25	1.17	1.20	1.17	1.23	1.21
Producer NAC (coeff.)	1.24	1.27	1.20	1.24	1.21	1.27	1.25
General Services Support Estimate (GSSE)	254	147	294	967	729	1 027	1 144
Agricultural knowledge and innovation system	52	46	73	217	224	225	203
Inspection and control	16	9	19	62	47	58	82
Development and maintenance of infrastructure	186	91	202	684	458	740	855
Marketing and promotion	0	0	0	3	0	5	4
Cost of public stockholding	0	0	0	0	0	0	0
Miscellaneous	0	1	0	0	0	0	0
Percentage GSSE (% of TSE)	10.3	5.9	9.4	14.7	13.4	14.5	16.3
Consumer Support Estimate (CSE)	-1 830	-2 181	-2 655	-4 826	-4 416	-5 580	-4 483
Transfers to producers from consumers	-1 750	-1 952	-2 244	-4 310	-3 830	-5 130	-3 970
Other transfers from consumers	-90	-239	-431	-537	-614	-467	-529
Transfers to consumers from taxpayers	0	0	0	0	0	0	0
Excess feed cost	11	10	21	20	28	17	16
Percentage CSE (%)	-22	-26	-21	-20	-20	-23	-18
Consumer NPC (coeff.)	1.29	1.35	1.26	1.26	1.26	1.30	1.22
Consumer NAC (coeff.)	1.29	1.35	1.26	1.26	1.25	1.29	1.22
Total Support Estimate (TSE)	2 494	2 571	3 130	6 520	5 457	7 064	7 040
Transfers from consumers	1 840	2 191	2 676	4 847	4 444	5 597	4 499
Transfers from taxpayers	744	619	886	2 211	1 627	1 934	3 070
Budget revenues	-90	-239	-431	-537	-614	-467	-529
Percentage TSE (% of GDP)	3.14	2.56	1.83	1.80	1.62	1.91	1.88
GDP deflator (1995-97 = 100)	53	186	285	375	370	380	n.a.

p: provisional, n.a.: not available.

NPC: Nominal Protection Coefficient.

NAC: Nominal Assistance Coefficient.

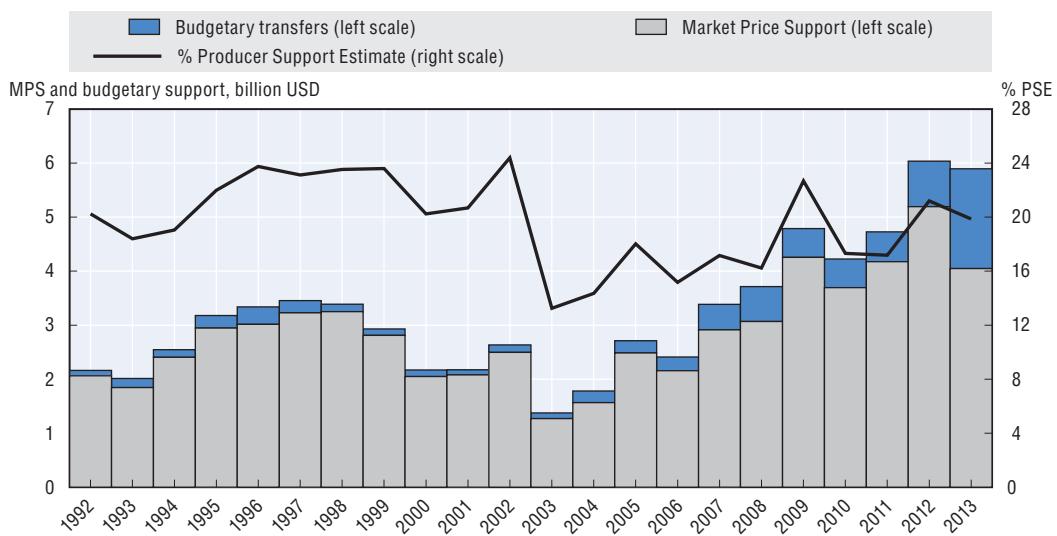
A (area planted), An (animal numbers), R (receipts), I (income).

1. MPS commodities for Colombia are: rice, maize, sugar, coffee, palm oil, plantains, bananas, cut flowers, milk, beef, pigmeat, poultry meat and eggs. Market Price Support is net of producer levies and Excess feed cost.

Source: OECD, PSE/CSE Database (2014a).

StatLink  <http://dx.doi.org/10.1787/888933181995>

Figure 6.1. Level and composition of Producer Support Estimate in Colombia, 1992-2013

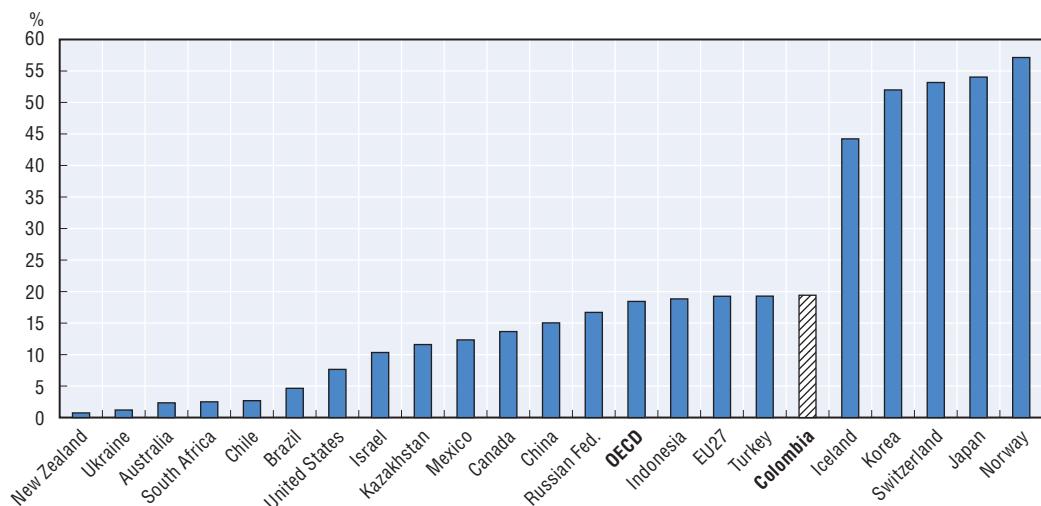


Source: OECD, PSE/CSE Database (2014a).

StatLink <http://dx.doi.org/10.1787/888933181973>

Figure 6.2. Producer Support Estimate in Colombia and selected countries, 2011-13

Per cent of gross farm receipts



1. The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.
2. The OECD total does not include the non-OECD EU member states.
3. 2010-12 average for Brazil, China, Indonesia, Kazakhstan; Russian Federation, South Africa and Ukraine.

Source: OECD, PSE/CSE Database (2014a).

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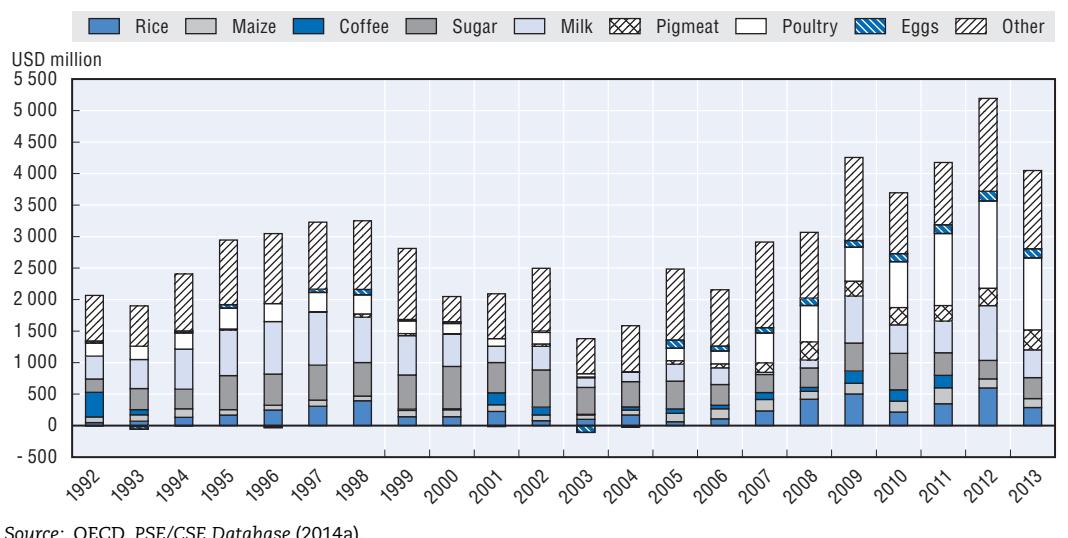
Composition of producer support

Besides the level of support, it is also necessary to analyse the way support is provided to farmers. For instance, support may be given through market price support (MPS) or may be provided through input subsidies, it may take the form of a payment per hectare or per animal, or as compensation to producer income. These distinctions are important as

support delivered in these various ways has a different impact on agricultural production, trade and agricultural incomes. Market price support is directly linked to commodity output and can have a significant effect on production. For this reason, this type of support is qualified as trade distorting; moreover, MPS is less effective in increasing producer income than other type of support like direct payments to farmers which is less attached to commodity output. Market price support also imposes additional costs on domestic consumers. On the other hand, support which is not based on commodity output, such as payments per hectare or direct income support, can be more effective to improve farmer incomes, to achieve environmental or rural development objectives, as well as have less spill-over effects on international trade (OECD, 2008).

MPS is the predominant component of producer support in Colombia (90% on average for the period 1992-2013). Products like rice, maize, poultry, sugar, milk and pigmeat have been major components of the MPS. This estimation greatly coincides with Colombia's use of the Andean Price Band System for some of these products (Figure 6.3).

Figure 6.3. Level and composition of Market Price Support in Colombia, 1992-2013, selected products



Source: OECD, PSE/CSE Database (2014a).

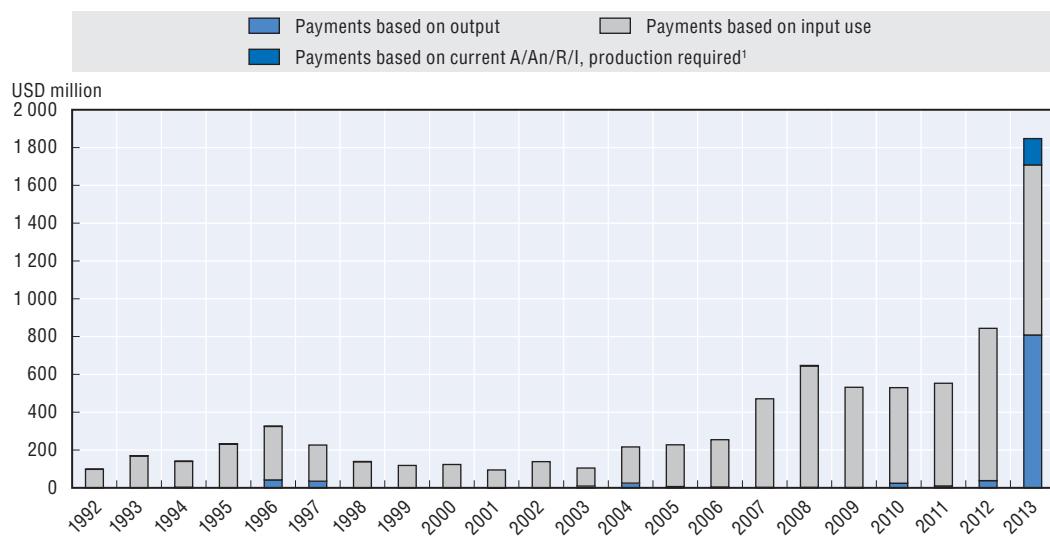
StatLink <http://dx.doi.org/10.1787/888933182010>

Budgetary transfers have been relatively small when compared to MPS and were more or less constant from 1992 up to 2006 accounting, on average, for only 10% of the PSE for the period 1992-2013. Nevertheless, for the past seven years, outlays have increased considerably, particularly for the year 2013 when expenditures more than doubled, and payments based on output for the coffee sector were provided. Budgetary support has mostly been provided through payments to farmers based on input use (Figure 6.4), of which around 14% have been given based on fixed capital formation, 73% on variable input use and 13% on on-farm services.

Commodity profile of producer support

Producer Single Commodity Transfers (SCT) show the extent to which agricultural policies are commodity specific. Figure 6.5 shows Colombia's %SCTs for all 13 products included in the PSE. These estimations principally reflect MPS. Poultry, pigmeat, rice,

Figure 6.4. Level and composition of budgetary transfers in Colombia, 1992-2013



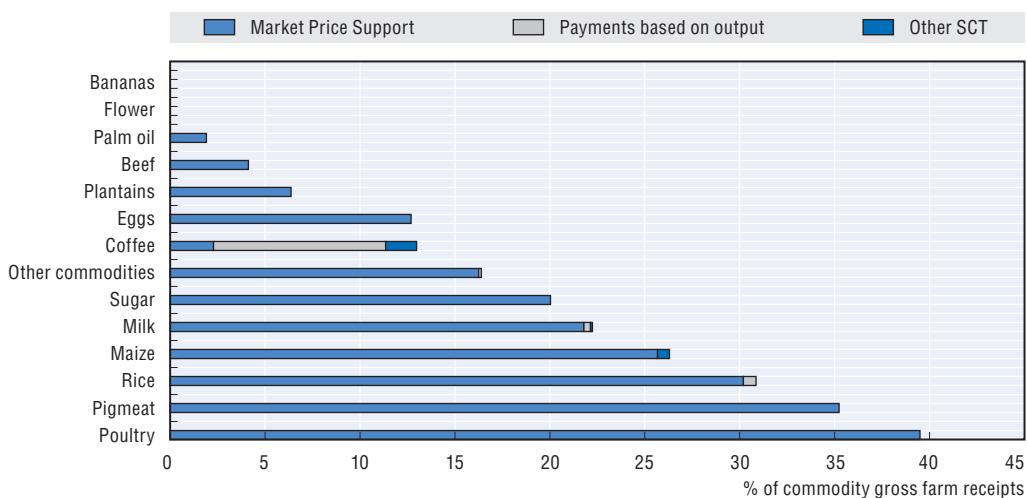
1. A (area planted), An (animal numbers), R (receipts), I (income).

Source: OECD, PSE/CSE Database (2014a).

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Figure 6.5. Producer SCTs for products in Colombia, 2011-13

Per cent of commodity gross receipts



Source: OECD, PSE/CSE Database (2014a).

StatLink <http://dx.doi.org/10.1787/888933182035>

maize, milk, sugar, and coffee have the highest % SCT, reflecting border measures, such as the Andean Price Band System and payments based on output, particularly on coffee. In the case of sugar, palm oil, milk and beef, the effect of price stabilisation funds by farmer associations is also captured in the estimations.

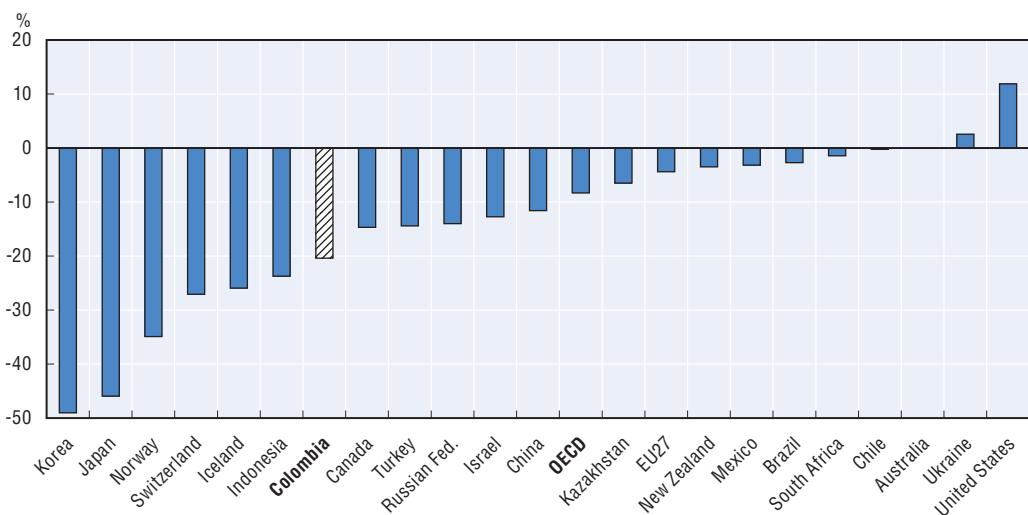
Support to consumers of agricultural commodities

The **Consumer Support Estimate** (CSE) measures the cost to consumers arising from market price support policies and it is measured at the farm gate level. A negative CSE indicates an implicit tax on consumers, i.e. they pay higher domestic prices than

international prices; a positive CSE suggests an implicit support, i.e. consumers pay cheaper domestic prices than international price. In the OECD methodology, the consumer is understood as the first buyer of these products. In the absence of consumer support policies, CSE generally mirrors MPS. Similar to the PSE, the CSE can be expressed in relative terms as a percentage of consumption expenditures (%CSE). The average %CSE for Colombia is estimated at -19% in 2011-13, indicating that policies to support agricultural prices increased consumption expenditure by 19% on aggregate (Figure 6.6).

Figure 6.6. Consumer Support Estimate in Colombia and selected countries, 2011-13

Per cent of consumption expenditure at farm gate



Notes: The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

The OECD total does not include the non-OECD EU member states.

2010-12 average for Brazil, China, Indonesia, Kazakhstan; Russian Federation, South Africa and Ukraine.

Source: OECD, PSE/CSE Database (2014a).

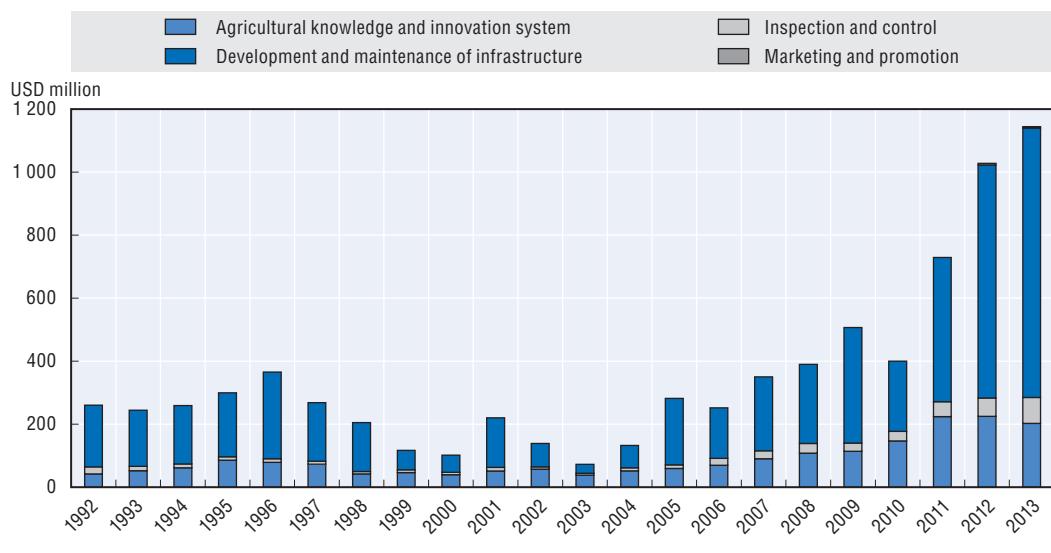
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Support to general services for agriculture

In addition to support provided to producers individually, the agricultural sector is assisted through the financing of activities that provide general services, such as the agricultural knowledge and innovation system, inspection and control services, development and maintenance of infrastructure, etc. This support is measured by the **General Services Support Estimate** (GSSE) indicator.

Government expenditures for the GSSE have been relatively small. Development and maintenance of infrastructure has been the most important category of GSSE during the period covered, accounting for 66% of expenditures (Figure 6.7). Agricultural knowledge and innovation systems have also accounted for a significant share of GSSE spending.

Figure 6.7. Level and composition of General Services Support Estimate in Colombia, 1992-2013



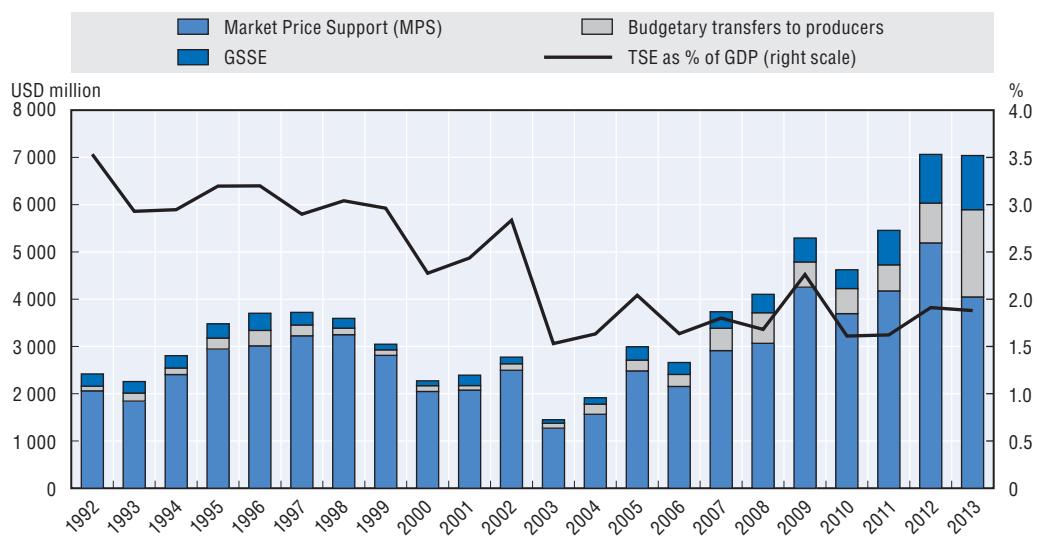
Source: OECD, PSE/CSE Database (2014a).

StatLink <http://dx.doi.org/10.1787/888933182053>

Support to the agricultural sector as a whole

The **Total Support Estimate** (TSE) is the broadest indicator of support, representing the sum of transfers to agricultural producers individually (PSE) and collectively (GSSE), and direct budgetary transfers to consumers (CSE). Expressed as a percentage of GDP the %TSE provides an indication of the cost that support to the agricultural sector places on the overall economy. Its value depends on the degree to which the agricultural sector is supported in a country, the size of the sector and its relative importance to the economy. Colombia's large variation in %TSE results from large variations in MPS. The aggregate TSE for Colombia averaged nearly USD 6.5 billion in 2011-13 (Figure 6.8).

Figure 6.8. Level of the Total Support Estimate in Colombia, 1992-2013

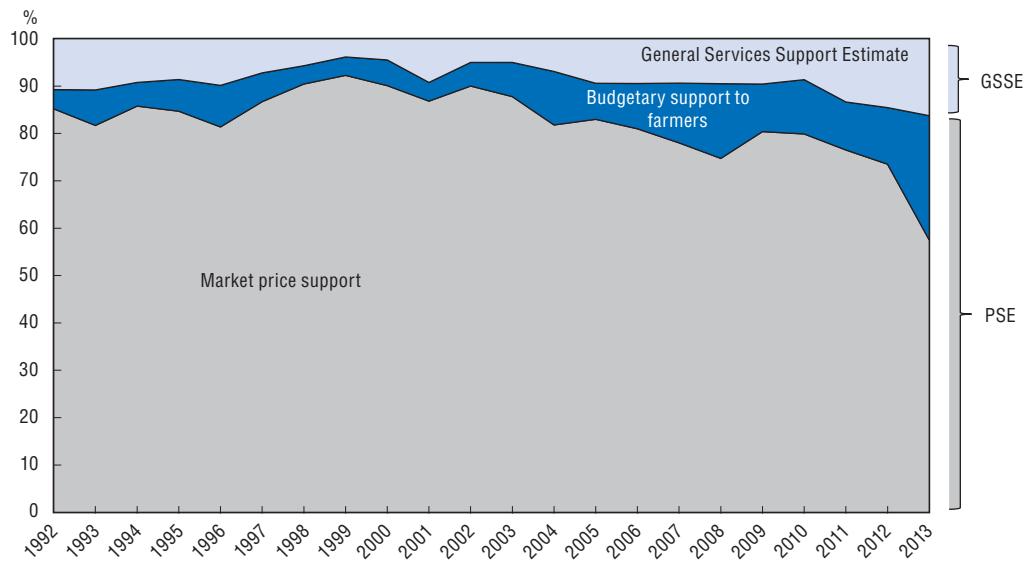


Source: OECD, PSE/CSE Database (2014a).

StatLink <http://dx.doi.org/10.1787/888933182062>

Figure 6.9 shows the composition of the TSE for the period 1992-2013, where levels of MPS have contributed the most, and where budgetary transfers and GSSE have been relatively small. Outlays for the GSSE in Colombia have been quite small, around 9% on average of TSE, for the period 1992-2013. Budgetary transfers have accounted for an additional 9% of TSE over the same period, while 82% of agricultural support in Colombia has been and continues to be provided in the form of MPS, a way that strongly distorts markets. In comparison, areas that are critical for agricultural development in both the short and long term, such as infrastructure and extension services, have been receiving little support.

Figure 6.9. Composition of Total Support Estimate in Colombia, 1992-2013



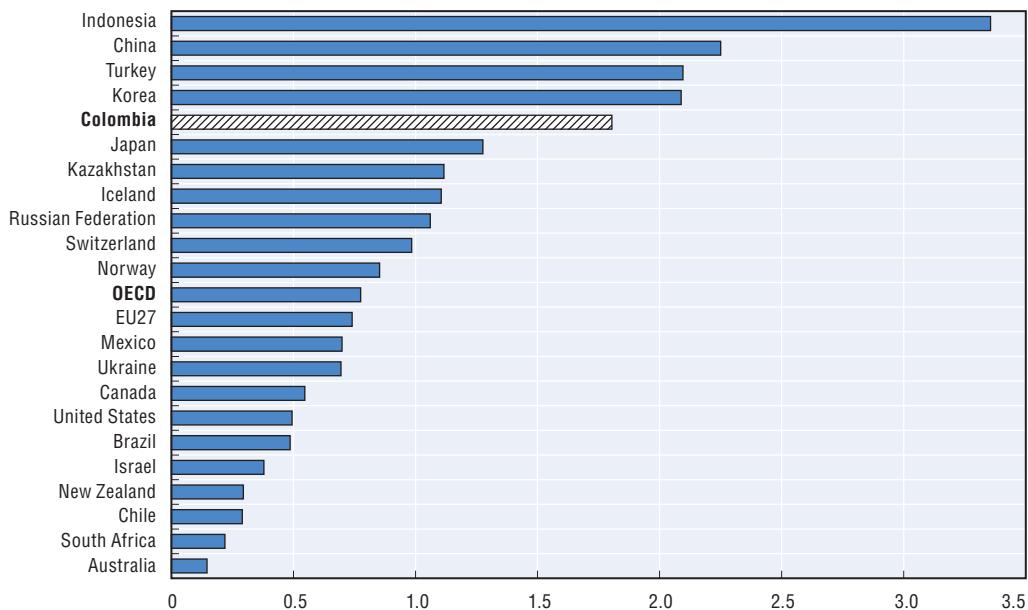
Source: OECD, PSE/CSE Database (2014a).

StatLink <http://dx.doi.org/10.1787/888933182075>

The level of total support (TSE) provided to agriculture in the period 2011-13 was 1.8% of GDP, twice the OECD average of 0.8%. This is lower than in China or Indonesia, but much higher than in Mexico or Brazil, and is roughly comparable to that of Korea (1.9%). Colombia's total agricultural support represents a significant cost to the economy and society as a whole (Figure 6.10).

Figure 6.10. Total Support Estimate in Colombia and selected countries, 2011-13

Per cent of GDP



Notes: The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

The OECD total does not include the non-OECD EU member states.

2010-12 average for Brazil, China, Indonesia, Kazakhstan; Russian Federation, South Africa and Ukraine.

Source: OECD, PSE/CSE Database (2014a).

StatLink <http://dx.doi.org/10.1787/888933182080>

Summary

- The level of producer support, as measured by the %PSE, was constant and positive during 1992-2013. In 2011-13, agriculture support policies generated around 19% of gross receipts of agricultural producers.
- The variations in producer support level were driven mainly by sharp fluctuations of its market price support component. Budgetary transfers have had an impact on changes in support only in the most recent years 2012-13.
- Producer support in Colombia is based predominantly on the most distorting forms of support, as a major component of agricultural support has been market price support for different crops and livestock products. Border protection such as the Andean Price Band System has been a major determinant. Market price support (MPS) accounted for 81% of the PSE for the period 2011-13.
- Products such as poultry, pigmeat, rice, maize, milk, sugar and, more recently, coffee attract high levels of support. Nevertheless, the estimated market price support transfers, whether positive or negative, reflect not only policy factors but also market weaknesses which generate additional implicit price taxation or protection to domestic producers.
- Budgetary transfers have been growing in recent years. Payments based on input use have dominated, although in 2013 large transfers based on output were given to coffee producers.

- General services for the agricultural sector have been neglected. Critical areas such as infrastructure, agricultural knowledge and agricultural knowledge transfer, farm restructuring continue to receive limited or no support.
- Total support to agriculture represents an important burden on the economy and society in general. The cost of the policies to consumers (through market price support) and, to a lesser extent, taxpayers (through outlays) is relatively high.

ANNEX 6.A1

A brief description of the products covered in the PSE calculations

Rice

In Colombia, rice is the most important short-cycle crop and it extends over 400 000 hectares of land located across 22 municipalities. Five main areas of production can be identified: the Eastern Plains (including departments such as Meta, Casanare, Arauca, Cundinamarca), the central region (including departments such as Tolima, Huila, Cundinamarca, Caldas, Boyacá, Cauca, Valle del Cauca), the lower Cauca region (departments such as Antioquia, Bolívar, Córdoba, Sucre, Chocó, the region of Urabá), the north coast (departments such as Cesar, Atlántico, Magdalena, Guajira) and the departments of Santander and Norte de Santander). Rice production is dominated by small and medium farms. The average farm size is estimated to be between 7 and 10 ha. There are about 60 mills across Colombia. Nevertheless, the milling industry is dominated by four large mills that absorb between 50% and 75% of sales (MADR, 2014).

Maize

Maize is mainly cultivated in regions where coffee is produced, as well as in the Santander, Tolima, Córdoba, Valle del Cauca, Meta, and Cesar departments. Maize is cultivated in 260 000 hectares. Around 85% of total consumption is satisfied by imports, particularly yellow maize used for animal consumption. White maize is destined to human consumption. Around 85% of the maize production is produced by small farmers (with less than 5 ha). There are approximately 200 000 producers of maize (MADR, 2014).

Sugar

Sugar production is located in the Cauca Valley (south-east of the country). The crop covers about 230 000 ha across 47 municipalities, from the northern part of the Cauca department, the central strip of the Cauca Valley until the south of the Risaralda department. Around 24% of this area is owned by sugar mills, while the remaining 76% is owned by sugar cane growers (around 2 750 producers) who supply the mills. Due to favourable agro-climatic conditions, it is possible to plant and harvest sugar cane during all months of the year. The average farm size is 92 ha. Around 22% of producers are considered to be medium (10 to 100 ha), while 57% are large producers (more than 100 ha). There are 13 mills in Colombia (12 companies). Approximately 26% of the sugar produced in Colombia is directed to the industry (e.g. sugar confectionery and soft drink companies), 46% is exported and the remaining 28 % goes to household consumption (MADR, 2014).

Coffee

Coffee areas cover approximately 974 000 ha across 592 municipalities, located mainly in the departments of Antioquia, Boyacá, Caldas, Cauca, Cesar, Caquetá, Casanare, Cundinamarca, Guajira, Huila, Magdalena, Meta, Nariño, Norte de Santander, Quindío, Risaralda, Santander, Tolima and Valle del Cauca. Colombian coffee is the 100% Arabica coffee variety. There are 564 000 coffee producers. In Colombia, coffee production relies on a structure of small size plantations that account for 71% of national production. About 96% of producers have less than 5 ha (small producers), 3% hold between 5 and 10 ha (medium producers, 12% of total production), and only 1% are large producers with over 10 ha (17% of total production). The collection of the grain is performed manually and this is one of the relevant determinants (alongside with weather and altitude conditions) of the Colombian coffee quality. The post-harvest phase is divided into two stages: wet processing and dry processing, both carried out mostly by farmers themselves to obtain the parchment coffee. There are 36 coffee co-operatives and about 541 points of collection centres where farmers sell their product. This structure is supervised and managed by the Federation of Coffee Growers (FEDECAFE). These co-operatives continue with the processing part to obtain green coffee, which is then exported (MADR, 2014).

Palm oil

There are approximately 476 781 ha cultivated with palm oil, spreading across the eastern part of the country (municipalities located in the departments of Casanare, Meta and Cundinamarca) and the northern and central part of Colombia (the departments of Antioquia, Bolívar, Cesar, Córdoba, Magdalena and Santander). The number of farmers producing this crop is around 8 000. Around 80% of producers are small (with plots up to 50 ha), 16% are considered medium (50-500 ha), while 4% are large producers (more than 500 ha). Colombia is the fifth producer at the world level, following Indonesia, Malaysia, Thailand and Nigeria, but represents only 1.6% of world production (MADR, 2014).

Plantains

The plantain is one stable food product in the Colombian household food basket. Approximately 394 000 hectares are devoted to plantain production, located across various departments in the Andean region, Atlantic coast and the Eastern Plains, with the bulk of production in the Andean-western area of the country (departments of Antioquia, Arauca, Córdoba, Caldas, Risaralda, Quindío, Casanare, Huila, Meta, Tolima, Valle del Cauca). There are about 185 000 producers, of which 85% of producers hold areas of plantation between 1 and 5 ha (smallholders), 10% of plots range from 5 to 15 ha, while only 5% have more than 15 ha. The domestic market is largely characterised by fresh plantain consumption (MADR, 2014).

Bananas

Two varieties of banana are produced in Colombia: banana for exports and for domestic consumption (*banano criollo*). The production area of banana for domestic consumption is approximately 14 000 ha located in the departments of Valle del Cauca, Tolima and Antioquia. Banana for export is produced in 49 000 hectares by around 633 producers. Regions such as the Gulf of Urabá and the north-east of Magdalena department are major production areas of bananas for exports (MADR, 2014).

Cut flowers

Approximately 6 892 hectares are currently cultivated with flowers (departments of Cundinamarca, Antioquia, Boyaca, Caldas, Cordoba, Quindio, Risaralda, Sucre, Valle del Cauca). The number of farmers is estimated at 1 484. There are around 4 899 planted hectares in Cundinamarca, mainly near the capital Bogota, followed by 1 593 planted hectares in Antioquia particularly in Rio Negro, followed by a significant distance of departments such as Boyacá (61 ha) or Valle del Cauca (29 ha). The rose is the most important variety covering 38% of the total area, followed by carnation with 16.8%. Other varieties include alstroemerias, hydrangeas, pompons and chrysanthemums. It is estimated that the sector generates approximately 80 000 direct jobs. Small farms cover up to 10 ha (3 706), medium farms between 10 and 20 ha (126), and large producers more than 20 ha (39). There are approximately 350 companies engaged in the production and export of flowers. These are mainly located in the Bogota savannah, Rio Negro and La Ceja in Antioquia and Piendamó in Cauca. About 95 % of flowers production is exported (MADR, 2014).

Milk

From the national cattle inventory of 2012, 38.5% of the cattle is oriented to dual-purpose system, 11% to milk production and 49.6% to meat production. Milk production is concentrated in the Atlantic Coast and the Central Region, particularly in the departments of Cundinamarca (18.6%), Antioquia (16.8%), Boyacá (11.5%), Magdalena (7.7%), and Cesar (6.5%). The dual-purpose livestock system generates 468 000 permanent jobs while the specialised milk production system generates 110 000 jobs. There are 400 000 milk producers across the country. The milk sector is characterised by a large informal market. It is estimated that of the total national milk production, 43% is marketed informally, while industry collects 32%, 15% is collected by intermediaries and co-operatives and the remaining 10% is destined to self-consumption. There are 650 companies registered as processors, but the top 25 companies collect 79% of the milk production. Colombia is self-sufficient on milk (MADR, 2014).

Beef

The national cattle inventory for 2012 estimated a total of 20 432 140 heads, of which 49.6% are used for meat production. The Departments with the largest number of cattle are Antioquia, Meta, Casanare, Santander and Cordoba (45.5% of the registered inventory), followed by the Departments of Cesar, Magdalena and Cundinamarca (representing 19.6% of the inventory). The processing industry of beef by-products is not developed as it encounters technological and infrastructure difficulties. An important level of informality in the meat industry is observed, as 34% of the domestic beef market is processed in informal meat slaughterhouses that do not comply with sanitary requirements (MADR, 2014).

Pigmeat

In 2012 there were registered approximately 29 000 farms dedicated to this activity. As in the cases of milk and beef, the pigmeat subsector has also an important informal market. About 82% of pig animals are sold alive. There are around 40 deboning plants authorised in the country. Efforts have been made to develop infrastructure for the storage and maintenance of the cold chain and strengthen inspection and supervision controls in retail centres. Around 13% of national consumption of pigmeat is imported (MADR, 2014).

Poultry

Poultry production is concentrated in the departments of Cundinamarca, Tolima, Huila and Boyacá (32%), followed by the departments of Santander (26%), Valle del Cauca (16%), Antioquia (9%), the Atlantic Coast (9%) and coffee producing regions (7%). About 60% of poultry production is certified with bio-safety standards that ensure good animal health management. According to the 2002 sector census, 3 010 commercial poultry farms were registered, 1 883 of which dedicated to fattening chicken, 961 to egg production and 166 to breeding. Overall, these establishments count with 30 646 chicken warehouses. Colombia is a net importer of poultry products, the main suppliers being the United States and Canada (MADR, 2014).

Eggs

Egg production in 2012 was of 10 605 million units (equal to 636 343 tonnes). Around 91% of the eggs produced are brown and used for direct human consumption. The remaining 9% is used as input for the pastry industry. Egg production in Colombia is scattered among a large number of producers, with scales ranging from 500 to over 500 000 laying hens and distributed across the Central Region of the country (32%), the Santander (24%), Valle del Cauca (24%) and Antioquia (12%) departments, the coffee region (4%) and the Atlantic Coast (4%) (MADR, 2014).

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PART III

Agricultural innovation in Colombia

PART III

Chapter 7

The agricultural innovation system in Colombia

This chapter provides an overview of the main actors in the Colombian Agricultural Innovation System and their roles in creating the institutional framework to spur innovation, including institutions that ensure the governance of the system. The chapter also presents the framework developed at OECD to analyse the role of the government in fostering innovation in the food and agricultural sector. In Colombia, there is a diversity of institutions involved in innovation, with different mechanisms for defining priorities and monitoring activities. The chapter thus identifies the key challenges in terms of governance and co-ordination.

Policy drivers of innovation

The main objective of Colombian economic and innovation policies since the 1980s has been to improve the country's competitiveness at the international level. In recent years, these policies have placed increasing emphasis on improving total factor productivity in all sectors. In the agricultural sector, higher productivity translates into increased production and higher income for producers, which in turn can generate multiplier effects in other sectors and contribute to increased GDP, particularly in countries or regions where agriculture plays a significant role in the economy.

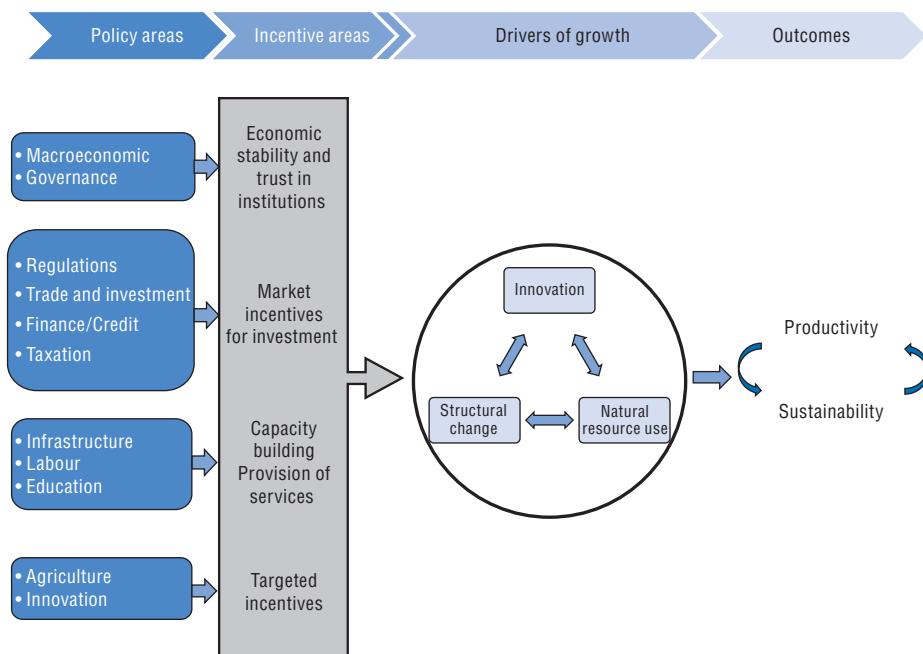
Structural change and innovation are the main drivers of productivity growth. Structural changes improve productivity through economies of scale and by facilitating the adoption of innovation (OECD, 2011, 2013). The adoption of new technologies and practices can improve production and/or save input use, including natural resources.

This review¹ of the Colombian agriculture innovation system outlines its strengths and indicates areas where improvements are needed. The OECD framework to analyse the role of the government in fostering innovation in the food and agricultural sector was applied (OECD, 2013, 2014) (Figure 7.1). Policies affect these drivers through four main channels or incentive areas:

1. Economic stability and trust in institutions (justice, security, property rights), which are essential to attract long-term investment in the economy.
2. Private investment, which in turn requires a transparent and predictable environment that balances the interests of investors and society.
3. Capacity building, including provision of essential public services.
4. Targeted incentives for innovation, structural change and sustainable resource use in the food and agricultural system.

The first three policy areas, which shape the enabling environment for the food and agricultural sector, are reviewed in Chapters 2 and 3. Agricultural policy, which is the focus of Part II, provides direct incentives and disincentives to adoption of innovation. Part III focuses on direct incentives to agricultural innovation through innovation institutions and policy, and discusses agricultural policy incentives to adoption of innovation in Chapter 9.

Figure 7.1. Policy drivers of innovation, productivity and sustainability in the agriculture and agri-food sector



Source: Adapted from OECD (2014), "Analysing Policies to Improve Agricultural Productivity Growth Sustainably: Revised Framework", available at: <http://www.oecd.org/tad/agricultural-policies/innovation-agricultural-knowledge-systems.htm>.

Agricultural innovation system: Actors, roles and governance

Agricultural innovation systems include a variety of actors – government at the federal and provincial levels, public and private research agencies, agribusiness, universities, technical assistance services, agricultural producers, information providers, and non-governmental organisations (NGOs) – whose actions and interactions lead to the creation and diffusion of knowledge. Good governance, including the identification of priorities, co-ordination of activities, and evaluation of outcomes is essential to ensure that innovation systems function correctly.

A fragmented institutional framework

In Colombia, agricultural innovation, which includes biotechnology, environmental science, and maritime science, among others, is a national priority. Several actors and institutions play important roles in the agriculture innovation system. Table 7.1 provides an overview of the key players and their main roles, while Figure 7.2 illustrates the relationship between them.

The **Colombian Institute for the Development of Science and Technology (Colciencias)** co-ordinates the national innovation system and innovation policy (Box 7.1). It is responsible for defining the government's administrative and financial arrangements to promote and allocate funds to science and technology (S&T). Colciencias also coordinates the boards of national S&T programmes. Since 2009, it heads the Agricultural Programme Board, which was previously headed by the Ministry of Agriculture and Rural Development (MADR). Members of this board include MADR's Directorate for Technological Development and Sanitary Protection. Thus, responsibility for co-ordinating the

implementation of innovation priorities in the agricultural sector falls to both MADR and Colciencias. The main role of this board, however, is to allocate funds.

The **Colombian Corporation for Agricultural Research (Corpoica)** oversees research and technology transfer activities in the agricultural sector. It is by far the largest agency involved in agricultural R&D in Colombia. It is a joint programme between MADR and several producer associations, universities, and regional institutions. It co-ordinates research activities, advises the government, and links regional priorities with national priorities as set out in National Development Plans (Box 7.1). Many other actors also play important roles in the co-ordination, planning, and implementation of innovation policies at the regional and municipal levels (Corpoica-Colciencias, 2013).²

National Development Plans (PNDs) define sectoral priorities for public investment. Within this framework, MADR and the National Planning Department (DNP) design agricultural policies, including those related to innovation. MADR also implements and assesses innovation policies in the agricultural sector.

Table 7.1. Main actors in the agricultural innovation system and their respective role

Role	Actors	Public	Private	Mixed
Co-ordination of the national innovation system (SNCTI)	Colciencias oversees the national innovation system (SNCTI), which includes the agricultural innovation system (SNCTA).	X		
Policy design, implementation and assessment	Ministry of Agriculture and Rural Development (MADR) , which covers agricultural policies including those related to innovation.	X		
Co-ordination of agricultural innovation system (SNCTA)	Corpoica plays an increasing role in the co-ordination of the SNCTA and provides policy advices in the areas of science, technology, and innovation in the agricultural sector, at both the national and regional levels.			X
Research and development (R&D)	Corpoica Public and private universities Private technological development centres Research groups and centres specialised in an agricultural supply chain (e.g. CENIs, Box 7.1) Non-governmental organisations (NGOs) Public and private companies	X	X	X
Technical assistance	Epsagros at provincial level, UMATAs at municipal level, Provincial Agribusiness Management Centres (CPGAs), regional governments, universities, CENIs, producers associations, private companies providing farm inputs and services, among others	X	X	
Education and training	Public and private universities, National Service for Learning (Sena) and Associations	X	X	
R&D funding	MADR and other ministries (e.g. education and training) Colciencias Local governments and municipalities, foreign governments International agencies for science, technology and innovation (STI) Foreign STI ministries and other co-operation bodies Parafiscal funds for specific supply chains on the basis of the volume of production and voluntary direct fees from producers (Box 8.1) General System of Royalties (GSR) (Annex 8.A2).	X	X	
Support	Chambers of Commerce, Bancoldex, ProColombia (Former Proexport), Icfes and Ictex ¹	X	X	

1. Bancoldex: Foreign Trade Bank of Colombia; ProColombia: Tourism, Investment and Export Promotion; Icfes: Colombian Institute for Assessment in Education; Ictex: National Colombian Institute for Educational Loans and Technical Studies Overseas.

Research is carried out by a variety of **research centres**, both public and private. These include Corpoica research centres and experimental stations, which provide the largest volume of research outputs, universities, private research institutes, and research centres

set up by producer associations that specialise in research for a specific agricultural commodity sector (Box 7.1). With the exception of these private research institutions, agricultural research in private companies is virtually non-existent. If it occurs at all, it consists of co-financing agreements with research centres and universities that are often financed by Colciencias. Other agencies do not conduct research but provide **technical assistance** services to municipalities (UMATAs), agricultural secretariats at the department level, provincial agribusiness management centres (CPGAs), and private professional organisations (Epsagros) (Annex Figure 7.A1.1).

Box 7.1. Producer association research centres

Research activities conducted by producer associations are funded through commodity taxes levied on private sector production or exports, which are called parafiscal funds in this report (Box 8.1). Thirteen producer associations are involved in agricultural research. Research activities are organised in various ways:

- Some producer associations have their own research facilities, called “supply chain research centres” (CENIs), and conduct their own research. The four main research centres are:
 - ❖ Coffee Research Centre (CENICAFFE) established in 1938 by the National Federation of Coffee Producers (FEDECAFE)
 - ❖ Palm Oil Research Centre (CENIPALMA) which is managed by the National Federation of Palm Oil Producers (FEDEPALMA)
 - ❖ Sugar Cane Research Centre (CENICAÑA) created in 1977 by the Association of Sugar Cane Producers (ASOCAÑA)
 - ❖ Federation of Rice Producers (FEDEARROZ) established in 1948 to provide technical assistance, and which started significant research activities in 1968.
- Other associations employ their own professional staff to test varieties and assist in transferring technologies developed largely by Corpoica. Examples include the Virtual Technological Development Centre for the Potato Agro-Food Chain (CEVIPAPA) and the National Federation of Cacao Producers (FEDECACAO).
- Other producer associations import most of their technologies from abroad, and conduct only limited research of their own. The Colombian Centre for Innovation in Floriculture (CENIFLORES) is an example.

Source: Stads and Romano (2008), www.asti.cgiar.org/pdf/Colombia_CB39.pdf (accessed 1 December 2013).

There is a large and diverse group of **R&D funders**, although the national system's resources are mostly received from the national budget, external loans, and international co-operation resources. MADR provides the largest share of national government funding for agricultural innovation, but other ministries contribute. Other public funders include local governments and municipalities, foreign governments, and international and foreign agencies for science, technology, and innovation (STI). Parafiscal funds provide important contributions (Box 8.1). Royalties from non-renewable resources are another source of funding. Since 2011, 10% of royalties collected in the General System of Royalties (SGR) are allocated to the Fund for Science, Technology, and Innovation, which funds projects proposed by municipalities and regions throughout the country (Figure 8.1).³ Agriculture has benefitted from a large share of these funds. In addition, international and regional

organisations such as the United Nations Development Programme, Food and Agriculture Organisation, Inter-American Institute for Cooperation on Agriculture, World Bank, and the Inter-American Development Bank (IDB) also provide financing, as well as evaluation, administrative and technical support, information, and networking (Fonseca-Martinez and Rugeles, 2004).

Co-ordinating the establishment of priorities and funding of activities in Colombia given the number and diversity of actors and institutions (Table 7.2) presents an important challenge, as will be discussed in the following sections.

Table 7.2. Typology and number of organisations in the National System for Agricultural Science and Technology (SNCTA)

Categories	National	International	Grand total
Companies	642	45	687
Public Agencies (National)	25		25
Public Agencies (Territorial)	807		807
International Co-operation Agencies	5	38	43
Unions and Associations	389	1	390
NGOs and Support Agencies	463	5	468
Producer Organisations	2		2
Universities, Research Centres	143	193	336
Grand total	2 476	282	2 758

Source: SNCTA observatory, baseline of organisations linked to Siembra (2013).

Governance framework for innovation

The promotion of STI is an important component of Colombia's competitiveness policy. In practice, however, the institutions that are in charge of competitiveness policy are different from those that are in charge of innovation policy. This creates an overlap between the national system to promote competitiveness and the national innovation system, although Colciencias, which co-ordinates innovation, and the National System for Competitiveness (SNC) are members of the same commissions and other advisory bodies.

The SNC is responsible for all the norms, activities, recommendations, resources, and programmes, as well as the public and private institutions that plan and promote productivity and competitiveness policy guidelines. It was created to oversee efforts related to the formulation, implementation, and follow-up of policies that affect the country's competitiveness, including STI.

Priority setting for agricultural innovation

Colciencias oversees the National System for Agricultural Science and Technology (SNCTA) with MADR. General government priorities for innovation in the agricultural sector are defined in the **SNCTA's Strategic Plan**, which itself is based on priorities established for sectoral public investment in quadrennial national development plans and in documents issued by the **National Council of Economic and Social Policy (CONPES)**, which define the national development strategy in the medium and long term. The agricultural part of the national development plans is jointly created by MADR and the National Planning Department.

Within this framework, each funding organisation defines its own priorities. These strategic plans take into consideration the abilities and competences of different research centres with the intention of strengthening the centres' capabilities over time.

Since 2006, priorities for public investment in organised supply chains, and for some private investment, have been established by **national research agendas** (*Agendas Prospectivas de Investigación y Desarrollo Tecnológico*). These agendas are established by supply chains (e.g. national research centres, CENIs, or producer associations) to align publicly funded research projects with the needs of producers and society. Research agendas have been partially implemented for 36 supply chains (comprising 52 different products) (Corpoica, 2013a).

The Siembra network, administered by Corpoica, manages information on research activities in supply chains.⁴ It will aid communications between technology users and technical assistance experts, on the one hand, and experts and research institutions on the other hand. The network registers R&D requests from an increasing number of supply chains. Each chain identifies areas where innovation is needed and defines its objectives, possible solutions, beneficiaries, educational disciplines required, technological gaps, possible impacts and other aspects. Co-ordinating the sectors' research requests with work being done in private research centres (by Conif and Cenipalma, for example) avoids duplicating research.

General Plans for **Technical Assistance** (PGATs) are created once the supply chains' initial requests have been defined and research priorities by chain and by product have been established based on development plans for each regional and municipality. Corpoica developed the methodology and supported the institutions that are responsible for designing and developing these plans, which then feed into its R&D activities.

In addition, Colciencias develops strategic plans to strengthen the institutional, human and research capacity of the agricultural innovation system. Priorities are given to the co-ordination, implementation and evaluation of innovation policy; the strengthening of human capital for research and innovation and networking activities; and the promotion of innovation for the development of the sector.

Several criteria are set to prioritise projects funded by **royalties** (Annex 8.A2), with the aim of "spreading the wealth", both in terms of money and capacity building. Important criteria include regional coverage (it is preferable if projects are identified as priorities by more than one department), regional equity, impact on development, existing capabilities in STI, potential competitiveness, high-performance sectors, interdisciplinary ability, risk management and the ability to transfer innovations across sectors. The governance of the STI Royalties Fund is currently being reviewed to ensure these criteria are used in practice (Proyecto de Ley de Acto Legislativo 014 of 2014).

Universidad Nacional, Colombia's largest university, establishes its own research priorities, including in agricultural sector-related STI areas in what the university calls its Agenda for Agricultural Sciences and Rural Development (**Agenda CADR**). The university includes some national research priorities in its own list of priorities (Universidad Nacional de Colombia, 2012).

Co-ordination of the national priorities for innovation and their implementation

Co-ordination of priorities for research in S&T at the national level ensures that the use of public funds reflects social priorities and those of the users of such technologies. An accurate definition of roles is a necessary precondition to achieving this co-ordination. For

the agricultural sector, as noted above, this higher level of co-ordination is managed through national development plans, which define public investment priorities.

Co-ordinating the implementation of innovation priorities in the agricultural sector is the responsibility of MADR and Colciencias through the SNCTA Board. In the case of multi-purpose technologies, co-ordination is carried out by the Advisory Board of SNCTI.

Each organisation has a different mechanism to define, co-ordinate and implement its own priorities (Box 7.2). Drawing on different national and international experiences, in 2011 MADR identified a need to build a National Agenda for Research, Development and Innovation for the Agricultural Sector, with the participation of all actors in the supply chains. This task was assigned to Corpoica. The supply chain networks are now the mechanism used to keep the National Agenda updated.

Box 7.2. Co-ordination mechanisms by organisation

Supply chains

In the case of supply chains with a clear territorial focus, co-ordinating the implementation of innovation priorities is carried out by Corpoica through Siembra. In this instance, the actions of all actors in the 36 supply chains are co-ordinated. MADR, with the support of Corpoica, has set in motion the formulation of PGATs by municipalities. These plans co-ordinate the investment priorities and their implementation in municipalities and constitute a prerequisite for MADR co-financing of municipal technical assistance. In addition, the PGATs allow activities and resources at the local level to be organised to comply with the objectives of the direct rural technical assistance services and ensure the progressive increase in coverage, quality and relevance.

Each supply chain research centre (CENI) co-ordinates research priorities and the implementation of innovation plans with its registered producers. The CENIs also co-ordinate some of their priorities with the government inasmuch as they may have access to public resources, or co-participate in Corpoica-funded research activities or their outcomes. However, the main source of financing for CENIs remains parafiscal funds.

In the case of other supply chains, specifically those not included in Siembra or in the CENIs, the co-ordination and implementation of priorities are directly carried out by MADR.

Regional priorities in supply chains

For products included in a supply chain, in regions that have Regional Chain Boards in place, officials of the supply chains are responsible for the co-ordination of priorities and their implementation within each chain, with the support of Corpoica through the Siembra network. Each supply chain group is assigned an innovation manager at Corpoica (Espinal, 2012).

For other products and supply chains that do not have the support of either Corpoica or the CENIs, the co-ordination of regional research priorities and their implementation is carried out in the Collegiate Management and Decision Body of the National Royalty System (OCAD), which includes the central government, local governments, and academic institutions. This body decides the allocation of resources from royalties. OCAD, with the support of specialist panels from Colciencias, ensures that the projects reflect the priorities established in the regulations and set by regional governments in their development plans. The co-ordination of the implementation is assigned to the entities of the central government that are in charge of the monitoring and control of projects approved in the National Development Plan and Colciencias.

Box 7.2. Co-ordination mechanisms by organisation (cont.)

Colciencias and universities

When public resources are distributed to **research projects** through calls for projects, Colciencias is in charge of the co-ordination and implementation of priorities. The different sections at Colciencias evaluate projects submitted to ensure that these fulfil all required conditions, not only in terms of their adherence to established priorities, but also in terms of competency and quality. During the execution phase, projects are monitored to ensure that their implementation occurs within set timeframes and under the conditions authorised. Evaluation and monitoring are assigned to peer researchers.

Regarding **universities**, the priorities defined in their STI plans are adjusted to match the priorities of the government because the co-financing of said plans is carried out through their participation in the calls for projects of MADR and Colciencias, as well as through agreements signed with government bodies at the national or regional level.

Evaluation of innovation in the Colombian agricultural sector

Colciencias's evaluation focuses on the institutional framework and the functioning of the system that provides support to the research and development of agricultural technologies (as well as other sectors and SNCTI), the capabilities for research and the numerical outcomes achieved primarily through calls for projects. Evaluation is mainly based on research outcomes, considering achievements (i.e. results) relative to objectives and goals, and including time and cost as additional factors.

Projects approved by Colciencias are evaluated on the basis of objectives, strategies, quantitative goals and indicators that are defined within the project when submitted, progress reports submitted by researchers and, once the project has been completed, outcomes of researchers and project leaders' work (Colciencias, 2011).⁵

Annex 7.A2 contains a number of management and product indicators used by Colciencias to evaluate the performance of the general innovation system (Table 7.3) and specific programmes and projects, which are collected mostly, inasmuch as achievements are concerned, by the STI Observatory. Colciencias also keeps an inventory of peer evaluators in its Red Scien TI, who can be used as supervisors in the partial and final evaluations of projects. Table 7.3 also describes the process used to select projects and the information it generates for evaluation.

Colciencias' evaluation system does not include quantitative indicators of the economic and social impacts of different programmes and projects co-financed by Colciencias, but efforts are being made in this direction (Box 7.3).

The SNCTA Board is in charge of the global evaluation of the agricultural innovation system, in co-ordination and co-operation with Colciencias and MADR.

Evaluations carried out by Colciencias for the SNCTA rely on data (generated internally or via contractors) based on documents and studies created within the system. It also uses public information networks such as the Colombian Observatory on Science and Technology (OCyT),⁶ the *Observatorio Laboral para la Educación*, and the National Administrative Department of Statistics (agro-industry) (Table 7.4).

Systematic methods and tools for monitoring and evaluating policies related to the agricultural and agro-industrial sector are, however, generally not available. The

Box 7.3. Colciencias and the evaluation of the impact of STI programmes

Policies relating to STI include the promotion of a civic and democratic culture in science, technology and innovation among the youth population through a programme called Research as a Pedagogic Strategy (IEP). In this context, programmes that promote STI education, such as *Programa Ondas*, need to be monitored to measure their impact and to develop guidelines for future public investment.

Colombia has received a loan from the Inter-American Development Bank (IDB, 2013) to increase investment in STI and to strengthen the National System for Science, Technology, and Innovation (SNCTI). Some of these funds were assigned to conduct an evaluation of *Programa Ondas*. The objective is to strengthen the capabilities of Colciencias and other key actors in SNCTI to carry out monitoring and impact evaluations of programmes.

Source: www.colciencias.gov.co (accessed 10 November 2013).

formulation of policies, plans, programmes and projects is not sufficiently precise, partly due to the dispersion of information sources on their objectives and characteristics, and on the recording and monitoring of implementation. In addition, the technical weakness of some of the executing entities makes it difficult to transfer important data such as indicators, baselines, and goals, among others, which would allow for the development of an evaluation process of products, results and impacts. This problem is particularly obvious with regard to innovation, where the recording and supply of data from the private sector is virtually non-existent (Corpoica, 2013b).

There are some important and increasingly frequent exceptions where monitoring and evaluation activities are carried out to measure the impact of the introduction of new technologies to a region or supply chain on products, farmers, and the socio-economic environment. The appearance of this type of evaluation has been increasing in the research agendas of CENIs. In CENIs, the evaluation and feedback processes are defined for specific supply chains and include an evaluation of research outcomes and impacts on crops and the surrounding socio-economic environment. Boxes 7.B.1 and 7.B.2 include two examples of CENIs.

Corpoica developed a participative *ex ante* evaluation methodology for the possible economic and social impact of STI activities based on the preparation of a general plan for rural technical assistance (rural PGAT) for each supply chain and each specially defined territory included in the municipal development plans. These plans are supported by Corpoica through the Siembra network. The formation of integrated chains in the Siembra network ensures there is sufficient technical and financial capacity, as well as availability of data, to carry out these evaluations. PGATs also provide a foundation that could be used in the future by the public sector, which is required for the feedback processes by decision-making authorities on STI policies. More information on methods to evaluate PGATs is available in Annex 7.A2.

Universidad Nacional has included evaluation activities in all of its STI research projects and programmes, specifically in its agricultural research through its Agenda CADR. These focus in particular on assessing the impact of research activities on the population, underlining the emphasis the university places on the areas of rural development and extension.

In **Colciencias**, the evaluation of programme and project outcomes, which are carried out by peer-registered researchers, is based on the diagnoses, strategies, and goals as set out in the projects submitted to the institution (Annex 7.A2).

Summary

- The Colombian agricultural innovation system includes a wide diversity of actors. This presents a challenge in terms of ensuring good governance and co-ordination. A first issue in terms of co-ordination is the overlap between the national system to promote competitiveness and the national innovation system.
- The agricultural innovation system (SNCTA) and the general innovation system (SNCTI) are linked through joint participation on general and sectoral boards, but there is no permanent and efficient mechanism to identify systemic failures related to multi-purpose technologies and to propose solutions to these failures.
- Institutions have different mechanisms for defining priorities and monitoring activities. The Board of the SNCTA is in charge of establishing policy priorities for innovation in the agricultural sector, but does not entirely fulfil this task since these policies are in practical terms defined by various other institutions. Corpoica was created to generate stronger links between the actors and to create mechanisms to match supply, including research, extension and technical assistance, with demand for agricultural innovation.
- Mechanisms are in place for systematic evaluation of both the general system and of individual projects. However, evaluation focuses on research outcomes rather than on impact. Moreover, evaluation suffers from the lack of agriculture-specific indicators. There is no single free-access, free-of-charge network for all actors to share information on efforts and outcomes of publicly funded agricultural research and innovation. This makes monitoring and evaluation particularly difficult and incomplete.

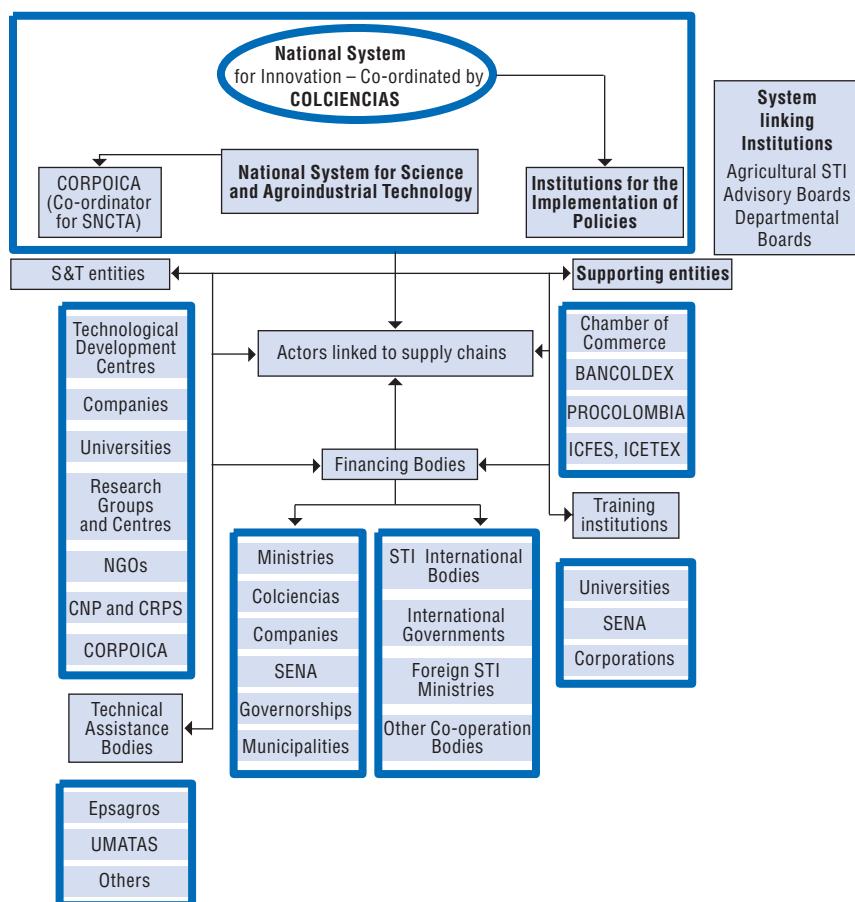
Notes

1. Chapters 7, 8 and 9 are based on a consultant report prepared by Luis Alberto Zuleta J. and Lino Jaramillo G., who reviewed the literature and statistics issued by the public and private sectors, and interviewed members of the Ministry of Agriculture and Rural Development ; Ministry of Commerce, Industry and Tourism; National Planning Department; Colciencias; Corpoica; and Cenired.
2. At the regional level, they include: local governments and provincial secretariats of agriculture; departmental councils for agricultural development (CONSEA); regional competitiveness commissions (CRC); university-company-state committees (CUEE); departmental committee for science, technology, and innovation (CODECTI); and producer organisations. At the municipal level, they include: town halls and municipal councils for rural development (CMDR).
3. Before the 2011 GSR reform, royalties benefitted only the regions they originated from and no funds were earmarked for STI.
4. See the Siembra network database at: www.siembra.co/siembra/main.aspx. This network is at an advanced stage of its structuring process. It is financed by the MARD and developed and managed by Corpoica. The Siembra platform will be the main database for information on innovation and will cover the last ten years.
5. The number of reports or releases that each project is required to issue, as well as the timetable of submission of these reports to Colciencias, are specified in the Memorandum for the Preparation of Contracts (Memorando de Elaboración de Contrato), which each individual responsible for a project receives together with a copy of the contract duly finalised.
6. <http://ocyt.org.co/en-us/> with added indicators for science and technology in Colombia and www.colciencias.gov.co/scienti with the inventory of research groups, researchers and peer researchers (CVs), as well as indexed magazines, publishers and PhD study programmes.

ANNEX 7.A1

Co-ordination of innovation policy

Figure 7.A1.1. Policy-generating bodies



Note: See list of acronyms.

Source: Based on Corpoica (2014).

StatLink <http://dx.doi.org/10.1787/888933182099>

ANNEX 7.A2

Evaluation mechanisms and criteria

Indicators used by Colciencias

Table 7.A2.1 presents some of the criteria and indicators used by Colciencias to evaluate the results of its STI policy (Colciencias, 2011; Colciencias and DNP, 2012).

Regarding indicators for supplies and products, and in order to evaluate specific products, Colciencias talks about *management (supplies)* and *product evaluations* of the programmes and projects, including those related to the agricultural sector, to which the available resources are assigned by means of calls for projects.

Management indicators for STI programmes and projects are those that “quantify physical, human and financial resources used in the development of action; these indicators measure the number of actions, processes, procedures and operations carried out during the implementation stage” (DNP, 2009).

Among the general management indicators in Table 7.A2.1, the following are used for projects and programmes relating to the agricultural sector (or any other economic sector) (DNP, 2009):

- Number of alliances subscribed in the framework of project development for the development of STI activities.
- Number of co-operation agreements currently in execution that have been subscribed in the context of the development of the project to be implemented.
- Number of departments (political geographic regions) receiving annual financial support to prepare the STI Departmental Strategic Plan (*Plan Estratégico Departamental de CTI*).
- Number of departments using resources to finance STI activities with the support of Colciencias.
- Number of evaluations financed in the context of calls for investment projects. These are preliminary evaluations to determine whether or not the project is compatible with established priorities.
- Number of STI regional funds supported.
- Number of modules in the information system that are updated/integrated as part of the investment project.
- Number of proposals submitted: that fulfil the requirements; that were assessed by peers; that were recommended by peers; and that were approved at the close of the calls for projects carried out as part of the investment project.

Table 7.A2.1. Selected indicators used to evaluate the performance of the general innovation system

Strategic objectives	Operational objectives	Some indicators
I. Co-ordinated design, evaluation and execution of the national STI policy for SNCTI and for SNCTA	a. The Ministry of Agriculture and other bodies in the agricultural sector co-ordinate their innovation policies with Colciencias	Number of evaluations (documents) performed on the STI programme of the agricultural sector Number and name of the institutions co-ordinating their STI policy with Colciencias in the CNCTA (Board) Number of CONPES documents to evaluate and modify the STI policy in the agricultural sector Number of agricultural sector plans designed by the National Agricultural S&T Board Number of prospective studies and technological vigilance studies performed Progress made, expressed in percentages, in the implementation of an integrated information system in sectoral STI
	b. Public and private participation in STI investment in the agricultural sector	Absolute figures and percentages
II. Increase and linkage of human capital to research and innovation in the agricultural sector	Support to advanced training in the areas of research and innovation in the agricultural sector	Number of fellowship recipients Number of postdoctoral stays by Colombians or foreigners in this country in the framework of R&D projects Number of PhDs engaged through the labour absorption programme to develop research tasks in companies Number of countries with which co-operation agendas have been established with programmes linking the Colombian scientific diaspora, etc.
III. Promotion of knowledge and innovation for the development of the agricultural sector	a. Creation of interdisciplinary networks that perform research programmes. b. Consolidation of the research infrastructure and the scientific community c. Integration of different areas of knowledge and interchange of knowledge in the resolution of issues d. Promotion of innovation in strategic areas	Number of programmes and number of experiences Number of researches per million inhabitants Number of articles by Colombian researchers in publications indexed in SCI and SSCI per million inhabitants Number of patents obtained; number of companies doing research certified by a Chamber of Commerce; number of investigation centres that fulfil the standards of Colciencias Percentage of groups or research centres that have developed projects with native or vulnerable communities Growth in value and number of companies that have benefitted from innovation instruments Percentage of exports with high added value; percentage of innovative companies Number of initiatives for the creation of technology-based companies Number of calls to finance projects for the improvement of competitive abilities Number of calls to finance sectors based on the incorporation of higher knowledge with high-yielding products Number of research and innovation networks set up to support the agricultural sector
	Creation and consolidation of regional platforms to provide support to innovation in the agricultural sector	Number of platforms and regional networks supported Number of projects generated in university/business/state-type business conferences.

The **product indicators** for STI programmes and projects “quantify goods and services (intermediate and final) produced and/or provisioned for after a particular intervention as well as the changes generated by it that are pertinent for the achievement of the direct effects” (DNP, 2009). In the case of Colciencias, the following product indicators are used to evaluate the annual outcomes of the management of programmes and projects carried out with the resources supplied by the institution in the calls for projects:

- Number of technological management centres created or supported.
- Number of research centres of excellence supported.
- Number of technological research and development centres supported or created.
- Number of technological parks created or supported.

- Number of productivity centres created or supported.
- Number of recipients of non-refundable grants for PhD studies in the country or abroad.
- Number of recipients of credits granted for graduate studies in subjects oriented toward research in the country or abroad.
- Number of regional STI funds created.
- Number of participants in training programmes (in person or virtual) focused on the management of knowledge and innovation.
- Number of research groups supported or created.

Information for evaluation generated by the project selection process

In **Colciencias**, the evaluation of programme and project outcomes, which are carried out by peer-registered researchers, is based on the diagnoses, strategies and goals set in the projects submitted to the institution in the calls for projects held on a regular basis (a kind of *ex ante* evaluation without a projection of impact on the affected populations). Some projects may present goals regarding populations affected by the project, but most of them focus on quantitative goals about the number of individuals assisted or possibly affected in a positive manner. Colciencias provides applicants with a manual on how to prepare projects to be submitted to the institution (Colciencias and DNP, 2012).

The projects will generate information for forthcoming evaluations (not focused on economic and social impacts for the time being) performed by Colciencias via registered evaluators.

The outline of projects submitted to Colciencias includes data on several assessable aspects, which are in turn based on targets:

- Formulation of the programme or project: This includes the contribution of the project to public policy, as well as the identification and description of the problem to be faced and the state-of-the-art solution.
- Population affected by the problem that was identified: Regions, municipalities or departments and target population of the project.
- Specific objectives of the project: Definition of indicators to be used to measure the scope of the specific objectives.

The forms provided by Colciencias for this process depend on the type of evaluation chosen, as well as the objectives, goals and management, outcome and impact indicators used for measuring the project, among other points. All indicators are numerical. In the case of a quantitative evaluation of a project, a whole set of indicators are to be taken into account. It is important to reiterate that Colciencias does not perform economic and social impact evaluations, but rather achievement evaluations based on the goals of STI activities proposed by researchers.

Corpoica and PGATs

Corpoica developed an evaluation methodology *ex ante* to examine possible economic and social impacts of science, technology and innovation activities. This methodology was based on the preparation of a General Plan for rural Technical Assistance (rural PGAT) for each supply chain and each specially defined territory to be included in the Municipal Development Plans.

In order to evaluate the social and economic impact of municipal (but territorially applied) PGATs,¹ these plans must apply to supply chains included in the Siembra network and be designed to include the following seven key aspects (Gallego-Gómez, 2013):

- *Territorial focus*, with homogenous territory and internal social cohesion, shared history, and traditions, sense of common identity, etc. This is a key precondition.
- *Bottom-up focus* (economic and social interest groups and representative institutions, both public and private).
- *Focus on local associations and organisations to promote rural development*. Organisation of public and private actors supporting PGAT and equipped with a technical team, the authority to make decisions, and a budget.
- *Innovation*. The actions taken must be innovative.
- *Integrated approaches*. Linked and co-ordinated with actions and projects emanating from the different actors and the economic, social, cultural and environmental sectors present in the territory.
- *Networking and co-operation between territories*. Exchange and circulation of data and dissemination and transfer of innovation between territories.
- *Local financing and management*. OLDERs still have a large percentage of responsibility in decision-making regarding financing and management, depending on the specific organisational and local context.

In **Corpoica**, the *ex ante* impact evaluations of technical assistance are supported by surveys and the collection of data carried out by technical assistants among the different producers. These evaluations are performed each time the PGATs are updated, i.e. each time departmental and municipal plans are updated. When these evaluations are performed *ex post*, they help when reconsidering changes in priorities within the respective chains.

Surveys are another important source of STI information to evaluate the results and impact of STI research. These require a census to determine the level of representativeness in all the supply chains or, alternatively, information representative of a union or association of producers. Agricultural surveys are difficult to carry out and costly due to the need to visit all regions, public order issues in some of them, and the difficulty in obtaining the necessary data. Surveys are nevertheless vital in evaluating the impact of research projects. An example of an interesting survey and its analysis was carried out by the Universidad Jorge Tadeo Lozano (UJTL), a private institution. In 2011, it undertook a survey of six supply chains in six regions. This survey (named ENIAGRO) (Rugeles et al., 2012) was taken directly from the agricultural producers and, in its first stage, had a limited range and focused on the level of innovation of these supply chains, as well as its relation with the types of transactional models used by the producers (to some extent reflecting the influence of incertitude on innovation), the level of complexity of the technology applied, and the level of linkage between producers and the knowledge networks, research groups, universities, among others.

The National Administrative Department of Statistics (DANE) carried out an extensive survey on innovation in the manufacturing industry some years ago and is currently starting another survey centred on several services. It is expected that after concluding the Agricultural Census, DANE will be able to design a survey on the agricultural sector (including its science and technology component) based on supply chains but delimitated geographically by territories as defined in the PGATs performed by Corpoica.

Evaluation in national research centres (CENIs)

CENIs, or private research centres, carry out all the stages related to innovation planning, from the setting up of research priorities to the evaluation of impact on property and on the economic and social environment, with the resulting feedback communicated to those who define priorities and have the power to change the institutional framework or to adjust it. Those centres specialising in a specific supply chain have access to the unified data and their activities are driven by cost-benefit criteria with which, in most cases, the research outcomes and their social and economic impact are monitored and evaluated.

Two examples of evaluation are shown in Box 7.A2.1 and 7.A2.2.

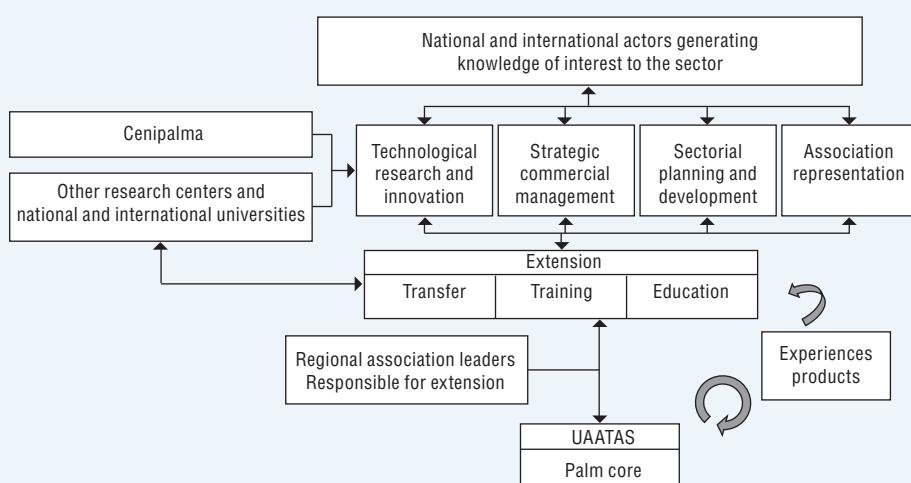
Box 7.A2.1. Palm Growers Research Centre (CENIPALMA)

Cenipalma is the palm growers' research centre. It is financed with parafiscal resources and through fiscal incentives made available to palm oil producers to convert palm oil into biodiesel.

In Cenipalma, the extension programme is in charge of the transfer of technology and provides technical assistance through independent companies. The creation and strengthening of these companies is promoted by Cenipalma in the different palm grower groups. These companies are called technical, environmental, and social assistance units (*Unidades de Asistencia Técnica Ambiental y Social – UAATAS*) and interact directly with the producers, although producers can contact Cenipalma directly as well.

The Department for the Transfer of Technology (*División de Transferencia de Tecnología*) at Cenipalma is in charge of developing links between researchers and palm growers, developing pilot tests to validate technologies and their transfer, and educating and training the UAATAS regarding these technologies. This Department likewise seeks to ensure the appropriate formulation of research projects, including the statistical analysis of their outcomes. It also attempts to support the projects of Cenipalma in terms of the economic analysis of research outcomes and to promote “competitive referencing”, i.e. impact evaluation, in the agro-industry.

Figure 7.A2.1. Structure of the research and extension activities at CENIPALMA



Source: www.cenipalma.org/menu-extension (accessed 12 December 2013).

Box 7.A2.1. Palm Growers Research Centre (CENIPALMA) (cont.)

In addition, the Department of Specialised Technical Services at Cenipalma (*División de Servicios Técnicos Especializados de Cenipalma*) assesses, diagnoses, and analyses specific subjects required by the palm growers and develops specific plans according to the needs of companies.

In summary, Cenipalma's Extension Plan (*Programa de Extensión de Cenipalma*) attempts the following:

- Identifying and characterising strategic allies (palm oil producers) and their needs.
- Acting as a “unit” to provide technical assistance in internal and external areas.
- Strengthening the technical assistance teams according to the area of the strategic partners.
- Establishing baselines for the adoption of technologies for each of the strategic allies.
- Creating strategic extension plans to the different palm grower groups to bridge productivity gaps and propose action plans with goals and indicators”. Such plans are essential for future evaluations.
- Providing technical monitoring and “offering” services to strategic allies.
- Applying methods and techniques of extension to improve communication among technicians and their interactions with strategic partners.
- Provide feedback on the extension service, through UAATAS, to the researchers and to the *División de Servicios Técnicos Especializados*.

Box 7.A2.2. Research Centre of Coffee Growers (CENICAFÉ) and Federation of Coffee Growers (FEDECAFÉ)

CENICAFÉ is financed with funds from the National Federation of Coffee Growers (FEDECAFÉ – a private body) and from the National Coffee Fund (Fondo Nacional del Café), a semi-public body.

CENICAFÉ has eight experimental stations where the outcomes of research projects are tested. For instance, in 2012 the outcomes of a research project on a device for the manual harvesting of coffee were presented to 304 coffee growers and 28 collectors in 7 departments. Extension activities for the transfer of the Castillo-type coffee were carried out in 75 acres of the experimental stations and in 45 coffee grower farms certified by CENICAFÉ.

As a complement to this and other research tasks, several issues of five different types of publications sponsored by CENICAFÉ were published: *Avances Técnicos, revista Cenicafé, Boletín Técnico, Brocartas, and Alertas Cafeteras*.

In the course of 2012, some economic research was carried out in CENICAFÉ in connection with the impact of the research. These are mentioned below as an example of field researches performed by CENICAFÉ and the FEDECAFÉ:

- Economic evaluation of three coffee production systems. Economic effect of seeding distance and the number of plants of the Colombia variety.
- A survey of 228 coffee growers carried out in the coffee-growing region of Colombia (*zona cafetera*) to get to know the soil-conserving practices and their technological level.
- Study on the rate of use of pesticides in 72 coffee-growing farms in Cundinamarca and Santander by means of surveys and interviews.

FEDECAFÉ has its own extension service financed with resources by the National Coffee Fund and a new agreement with MADR, which provides support and consulting services to coffee growers on all types of technological, technical, economic, or other issues relating to farming, property, coffee-growing regions, and legal framework in coffee production.

Box 7.A2.2. Research Centre of Coffee Growers (CENICAFÉ) and Federation of Coffee Growers (FEDECAFÉ) (cont.)

The organisational structure of the extension service is comprised of leaders, “extensionists” and support personnel in 18 departments, 98 sectional areas and 588 municipalities in the coffee-producing area. A total of 1 669 professionals and technicians comprise the extension service at the national and regional level. Table 7.A2.2 shows some figures on the extension service of FEDECAFÉ.

Table 7.A2.2. Workforce in the extension service of the Colombian Coffee Growers Federation, 2012

Department	Co-ordinating Department Leaders and Administrative Assistants	Extension workers and national programmes	Subtotal Extension Service	Other Technical Assistance programmes	Total workforce
Antioquia	38	133	171	21	192
Boyacá	6	15	21	0	21
Caldas	61	74	135	25	160
Cauca	32	74	106	45	151
Cesar – Guajira	14	24	38	10	48
Cundinamarca	20	64	84	36	120
Huila	20	101	121	6	127
Magdalena	8	10	18	0	18
Nariño	18	40	58	56	114
Norte de Santander	14	37	51	15	66
Quindío	26	39	65	6	71
Risaralda	36	47	83	84	167
Santander	22	51	73	29	102
Tolima	33	106	139	8	147
Valle del Cauca	47	85	132	11	143
Caquetá	2	5	7	0	7
Casanare	2	4	6	0	6
Meta	3	6	9	0	9
Total	402	915	1 317	352	1 669

Source: www.cenicafe.org (accessed 12 December 2013), www.federaciondecafeteros.org (accessed 12 December 2013), Federación Nacional de Cafeteros, “Informe del Gerente General”, Caficultura Sostenible LXXVII Congreso Nacional de Cafeteros 2012.

Content and timespan covered in the existing databases

There are quantitative databases that contain the actions of science and technology on SNCTA. Since 2007, and based on these databases, the Colombian Observatory of Science and Technology (Observatorio de Ciencia y Tecnología, OCyT) (www.ocyt.org.co) has been performing quantitative evaluations of SNCTI, shedding some light on the SNCTA, although a complete, comprehensive, and regular evaluation is still lacking. This information is published annually and covers the quantitative capabilities in STI without determining whether the quantitative changes have had a bearing on national production or on the incomes of the recipients of the projects and programmes.

In 2013, OCyT published (independently from the document on indicators, although based on this document, and with full access to all the OCyT) a 428-page book where

several aspects of SNCTI are analysed (OCyT, 2013). These include the following indicators, many of which include figures for the agricultural or agro-industrial sectors:

- Co-authorships in the Web of Science.
- Production of scientific documents in the emerging departments.
- Regional capabilities for research.
- Human resources linked to research groups in Colombian universities.
- Autonomous I+DT centres from the areas of science and technology.
- Outcomes of surveys on technological development and innovation in the manufacturing industry.
- Software production in the Colombian scientific community.
- Public perception of STI in Colombia.
- Social appropriation of STI in the light of *Programa Ondas*.
- Public support to innovation: the Colciencias experience.
- Main results of the royalty system for STI.

It is clear that none of these studies evaluates the SNCTI, but they do constitute elements of an evaluation as they are steps forward in the building of new indicators specific to their studies, in addition to those included in the basic document on indicators published by OCyT, presenting what they observe from different angles and shedding light on some achievements (as well as failures) of the agricultural innovation system in absolute terms and in terms relative to SNCTI.

Table 7.A2.3 shows the main dataset available on innovation in the agricultural sector and the periods covered.

Table 7.A2.3. Main dataset on innovation in the agricultural sector in Colombia, 2013

	Basic content	Data availability
SIEMBRA	Results of research on technology, technology demand and supply, technological gaps, and available technical assistance, among other data.	
RIDAC	Network promoting access to bibliographical, scientific, technical, and academic documentation on the agricultural sector in Colombia.	
OCyT	Data on research capabilities and products in science and technology in Colombia.	Data for science and technology available since 1998.
AGRONET	Data and communication network between the actors of SNCTA on the organisational and production aspects of the supply chains. Contains basic information on innovation.	Data available in MADR since 2009.
RED DE C&T AGRICOLA	Sub-network in science and technology from AGRONET.	
SECOPI	Shared intellectual property service for the protection, management and commercialisation of research outcomes in the agricultural area.	n.a.
RENATA	Network connecting, communicating, and promoting co-operation between the academic and scientific community in Colombia and the international academic and scientific community.	n.a.
Observatorio Laboral de la Educacion	Data on higher education and its relationship with the labour market.	Data available for the period 2001-12.
DANE Agroindustria	Results of a survey conducted of manufacturing companies on the subject of innovation, including agro-industrial companies.	Data available for the period 2004-11.

n.a.: not available.

Source: Data made available by institutions in charge or obtained from their respective webpages.

Note

1. This means that each municipality will have as many PGATs as the number of territories with certain features included in it. These will constitute the PGAT of the municipality.

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PART III

Chapter 8

Investment and co-operation in innovation

This chapter highlights key challenges related to investment and co-operation in agricultural innovation. The public sector continues to be the main source of funding for agriculture R&D, whether performed by public or private organisations. The chapter provides an overview of the diversity of sources for public funding of R&D activities in Colombia, which are complemented by significant contributions from parafiscal funds (producer associations' commodity funds) and royalties, and highlights the challenges as regards their co-ordination. It goes on to look at the mechanisms through which funds are being allocated. There is also a discussion of mechanisms facilitating the sharing of knowledge and co-operation at national and international level.

Investment in innovation

Priority areas for public funding

Established priorities are expected to guide the allocation of public funds for agricultural R&D and technology transfer. As priorities differ by organisation, so does the allocation of funds to different topics. Sanitary and phytosanitary management, genetic improvement and agro-industry receive the largest shares of funds by both Colciencias and Corpoica.

According to the Strategic Plan (PEPNCTA) and in accordance with the development expectations of the supply chains, the direct R&D priorities for the supply chains are focused on the following areas:

- **Food safety:** Through the development and application of methods for the identification, detection, and sampling of pathogens in foodstuffs; development of good agricultural practices, with emphasis on methods to improve the quality of processed water and product disinfection; also, methods for the identification, detection and sampling of toxic wastes, heavy metals, antibiotics, and microtoxins in foodstuffs.
- **Conservation, characterisation, and utilisation of phytopathogenic and zoogenetic resources** for agriculture and for food consumption.
- **Plant health:** Development of resistance and tolerance to pests and diseases in agricultural crops; methods for the detection of quarantine-significant viruses; methods for the certification of non-existent or low sanitary risk of the main products for export.
- **Post-harvest management** of crops and quality control of fresh products.
- **Animal health:** methods for the detection of adulterants, toxic residues, and metals in meat and dairy products; recording methods and traceability systems.
- Application of **biotechnology** in the improvement and added-value generation in agricultural systems, livestock, forestry, and the food industry.
- **Social and institutional innovations** supporting the modernisation of the different chains in terms of associativity, vertical and horizontal integration between echelons and advancements in organisational, corporate and commercial management (Colciencias, 2005).

These direct priorities are complemented with the traditional lines of research and technology transfer to: 1) improve agricultural and forestry production systems to obtain higher yields and lower costs; 2) reduce production costs and improve the efficient use of supplies in the livestock sector; and 3) increase the efficiency of processing in the food-related or food-unrelated agro-industry (Colciencias, 2005).

According to R&D areas financed by MADR through direct allocation to Corpoica during the period 2002-10, research activities under national research plans focused on the development and adaptation of technologies for export products such as cocoa, palm oil, and fruits and vegetables, as well as basic food products such as corn and soya; and on strategic research projects, including research on biological start materials; good practices

and clean production; evaluation of laboratories performing quality control tests on milk marketed in Colombia; research on castor (*higuerilla*) oil as a raw material for the production of biofuel; and development of technologies for the exploitation of products such as wheat and *panela* (unrefined whole cane sugar) (Uribe Galvis et al., 2011).

Through the use of tenders, MADR supported research in technologies for the supply chains and a number of cross-cutting themes, such as climate change. According to the number of projects, the main co-financed research areas were: seeding materials and genetic improvement (26%), integrated management (19%), sanitary and phytosanitary management (19%), post-harvest management and transformation (17%), physiology/alimentation and nutrition (9%), soil and water management (6%), and quality and safety of products (4%) (Uribe-Galvis et al., 2011).

Annex 8.A1 presents information on the allocation of resources by thematic area (Figure 8.A1.1), by main research organisation (Figure 8.A1.2) and by type of institution (Figure 8.A1.3).

Sources of funding

The main sources of public financing for science and technology activities in the agricultural sector are:

- Colciencias resources allocated to calls for projects, with some exceptions where there is a direct invitation to specialists.
- MADR resources directed to Corpoica through a budget assigned to research in supply chains (inter-chain decisions and intra-chain decisions).
- MADR Tender Fund and the various instruments providing support to small farmers (mainly DRE programme), but also non-refundable loans for the rural young studying agricultural science and technologies.
- Resources derived from mining and hydrocarbon sector royalties assigned to innovation.
- SENA and its financing fund Emprender.
- ICA, INCODER and AUNAP.
- Regional resources for local universities.
- Tax incentives for business innovation.
- Icetex resources for education.
- Bancoldex Credit resources for entrepreneurship and business innovation.
- National Guarantee Fund (*Fondo Nacional de Garantías*): Innovation projects and business development for SMEs.

In addition, agricultural producers fund in part innovation activities related to their supply chain through parafiscal funds, direct contributions or partnerships (Box 8.1). No information is available on how the agro-industry funds R&D in private or public institutions.

Box 8.1. Funding by producers of agricultural innovation

Some agricultural subsectors are partly financed with so-called **parafiscal funds**, which are mandatory contributions by the producers established by Law 101 of 1993. Although these resources are not part of the national general budget, they are considered public

Box 8.1. Funding by producers of agricultural innovation (cont.)

resources collected among producers in order to benefit the subsector providing the contribution through investment programmes. MADR presides over all supply chain boards that decide on the use of these funds, part of which must be dedicated to R&D or other public goods. Parafiscal funds also fund technical assistance.

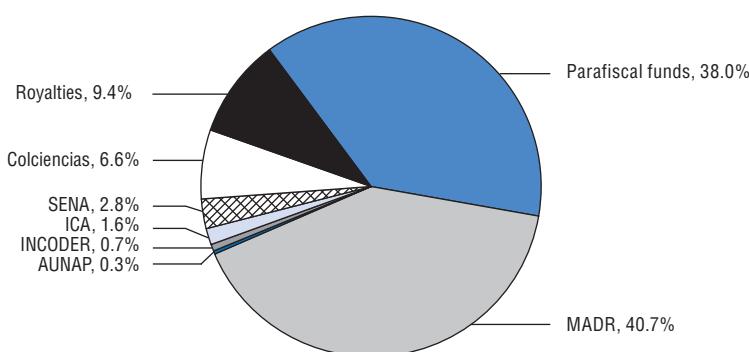
The following subsectors are entitled to receive these funds: cotton, rice, poultry, cacao, natural rubber, grains, soya beans, livestock, vegetables and fruit, legumes, palm, sugar cane, swine, and tobacco. Some institutions in these subsectors use the co-financing model for R&D through agreements with other entities.

Other agricultural subsectors are financed with contributions from producers other than parafiscal funds and/or through partnerships with third parties and/or through participation in competitive funds, as well as through direct support from the central government.

- Cenicafé, through contributions from coffee-growers and the government (mediated by the National Fund for Coffee) and through partnerships with other national and international entities.
- Cenicaña, through producers in the sector.
- Conif, through consultancy services.
- Genibanano, with producer contributions and partnerships with other institutions, both national and international.
- Ceniacua, through partnerships with other institutions and through public competitive funds.
- Ceniflores is a virtual centre that acts as a link between research entities and producers. Asocolflores finances research projects from third parties and participates in them through partnerships.
- Cevipapa is a virtual centre and was at some point in the past financed by MADR.
- Cenicel, a research centre for the grain and legume subsectors, is financed through parafiscal funds and partnerships with other entities.

Figure 8.1 shows that MADR resources and parafiscal funds accounted for the largest shares of total public investment, including parafiscal funds,¹ over the period 2000-12.

Figure 8.1. Public sources of funding for agricultural science and technology, 2000-12



Note: AUNAP: National Authority for Aquaculture and Fisheries; INCODER: Colombian Institute for Rural Development; ICA: Colombian Institute of Agriculture; SENA: National Agency for Learning.

Source: Corpoica (2013a), "Lineamientos de política en materia de inversión pública para la I+D+I en el sector".

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Reviewing trends in public expenditure for agricultural R&D from 1980 to 2006, Stads and Romano (2008) found that: “the share of Corpórica in total Colombian agricultural R&D spending and capacity has gradually declined over the past decades in favour of producer associations, other government agencies, and the university sector.”

The Colombian Congress approved Law 1731 of 2014 to increase the resources of Corpórica. It instructed that such resources be directly allocated from the national budget through a direct transfer from MADR’s annual budget. Once this bill is implemented, government investment in R&D can be distributed over the medium and long term. In addition, this law will assign a permanent budget base to Corpórica, allowing for increased support to supply chains and broader inclusion of farmers with smaller holdings in their ranks.

Funding allocation mechanisms

In the case of **Colciencias**, nearly all financing funds are assigned through tenders based on an evaluation made by external peers and a review and recommendation by the Agricultural Programme Boards, if applicable, or by the National S&T Board in the case of tax incentives. The different instruments can be grouped as follows:

- Financing for research and development projects (Corpórica, 2013c):
 - ❖ **Contingent recovery** for research and technological development projects, where the outcomes, due to their very nature, do not generate immediate economic benefits.
 - ❖ Incentives for technological innovation via **loans** (mandatory reimbursement loans): this model applies to innovation and technological development projects presented by public or private companies, where the expected results create real monetary value for the recipient institution and generate economic profit. They are funded by the Colciencias – Bancoldex and Colciencias – FINAGRO budget lines.
 - ❖ **Co-financing** of collaborative projects: the company applies to co-operative research and technological development projects executed through strategic alliances between beneficiary entities (companies and organisations producing goods and services) and executing entities (schools of higher learning, research centres, technological development centres and other similar technological centres). Under this model, Colciencias finances part of the total value of the project according to the contingent recovery principle, while the recipient institution co-finances the complementary portion proportionally and depending on the size of the beneficiary.
 - ❖ Shared technological risk for companies.
 - ❖ Guarantees for innovation and technical development projects: Agreement between Colciencias and the National Guarantee Fund.
- Financing for human resource training:
 - ❖ Educational loans.
 - ❖ Young researchers and innovators.
- Other support: Financing of patent registrations or technologies that can be protected.

With the exception of credit lines with an incentive to develop technological innovation, applications for financial resources from Colciencias are normally made through open calls.² In order to assign funds directly to specific topics, Colciencias also carries out a number of closed tenders directed at researchers who are directly invited by the institution to submit proposals in their area of speciality.

MADR resources assigned to **Corpoica** come from the National General Budget (*Presupuesto General de la Nación*). Decisions on the total amount are negotiated between MADR and the Ministry of Finance. The total amount depends to some extent on the current fiscal conditions in the country. The distribution of resources by supply chain reflects PGAT priorities, as well as the observable progress in the building and current operation of their respective research agendas.

Resources from **royalties for innovation** are distributed to the administrative regions by the Republican Congress (*Congreso de la República*), based on a number of indicators such as regional per capita GDP, thus allowing differentiation leading to greater equity. The capacity to absorb these funds varies greatly by region. Agricultural projects received 45% of royalty funds for innovation in 2013. For more information on the allocation process, see Annex 8.A2.

Public universities use calls for projects, contracts and co-operation agreements to allocate funds to research projects. They favour projects that focus on supply chains and basic research themes. According to a Colciencias report: “*In some cases, universities set up strategic alliances with the private sector. In this sense, operative units become the option to link together research and training. Their regional and local presence turns them into a strategic factor because of the increased opportunity they have to get to know local realities. Through their thesis, graduate and undergraduate students become an additional strategic capability for research*” (Colciencias, 2005).

When allocating funds, public agencies take into account the “state-of-the-art” with regard to nationally or internationally available technologies and innovations (Colciencias and DNP, 2012). Colciencias does this through its calls for projects, Corpoica through research work and technical assistance for technological transfers, and the public universities through research work financed by the national budget. This subject is undergoing a consolidation process as research agendas by supply chains are being developed, and the pertinent information networks are being built or until they become fully utilised (Siembra, Ridac, Renata, etc.).

In the case of Corpoica, a full diagnosis of the technological agenda is prepared in the PGATs held by municipality (and by neighbourhood); this diagnosis includes the current usage level and technological needs, on the one hand, and the national and international availability of the specific technology on the other. This makes it possible to determine what and where the technological gaps are – by product, farm, neighbourhood and municipality. The Siembra network includes a technological capability module that identifies for each unmet need in a supply chain, and for which universities, research centres, technical development centres and other national and international institutions can provide support in finding a solution (Siembra network, 2013;³ Corpoica-Siembra, 2013a and 2013b).⁴

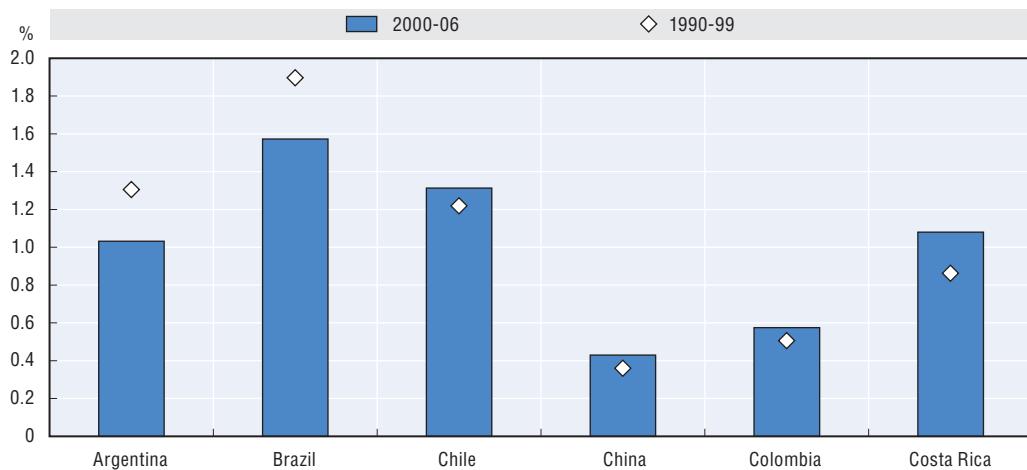
Universidad Nacional has included a chapter on the international agricultural science and rural development research scenario in its Agenda CADR: “*Such research is undertaken based on the review of prospective documents and technological vigilance data published internationally.*” (Universidad Nacional de Colombia, 2012)

Trends in public spending on agricultural R&D

Colombia maintained an average public investment of 0.5% of the sector’s GDP between 1981 and 2006. This is a relatively low figure compared to agricultural leaders in the region such as Uruguay, Brazil, Chile and Argentina, where average public investment

in agricultural R&D over the same period was 2%, 1.7%, 1.2% and 1.3% of agricultural GDP, respectively. Public investment in agricultural R&D in Colombia is comparable to the average investment made in countries such as Panama, United Republic of Tanzania, People's Republic of China (hereafter "China"), Honduras, Nigeria and India (Corpoica-Colciencias, 2013). Figure 8.2 illustrates some of these findings.

Figure 8.2. Public investment in agricultural R&D as a percentage of agricultural GDP in selected countries, 1990-2006

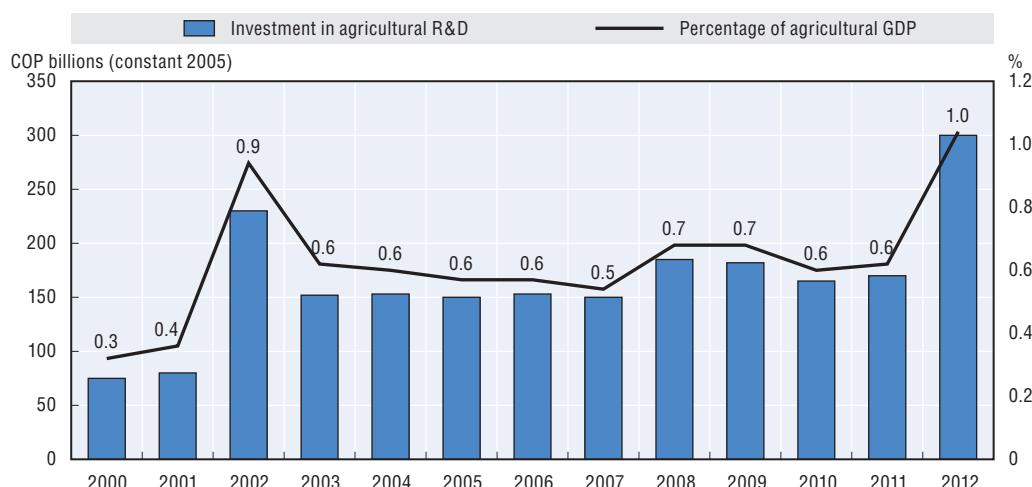


Source: ASTI Database (2014), www.asti.cgiar.org.

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According to recent information, public investment in science and technology activities for the agricultural sector accounted over the period 2000-12 for 0.6% of agricultural GDP, with an average annual growth rate of 2.1% (Figure 8.3). However, there is no clear trend over the period. Both in 2002 and 2012, research intensity (expenditure as a

Figure 8.3. Public investment in science and technology activities in the agricultural sector as a percentage of sectoral GDP, 2000-12



Note: Data for 2012 are budget data, including new funding from royalties. They are not actual expenditures.

Source: Corpoica-Colciencias (2013), "La Gobernanza del SNCTA. Diagnóstico y Propuestas para su Mejoramiento".

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percentage of agricultural GDP) was around 1%; in between these years it oscillated between 0.5% and 0.7% of agricultural GDP. It is not clear whether the 2012 figures include royalty funds as projects were approved in December 2012, but executed – totally or partially – in the course of 2013.

Co-financing and co-operation between public and private sector

No consolidated information is available on the total value of private investment in R&D in the agricultural sector. Data on parafiscal funds, which accounted for 38% of total funding over the period 2000-12, and government incentives such as the rural capitalisation incentive (ICR) or fiscal incentives for investments in innovation, could be used for reference. In the case of Colciencias and MADR, the private co-financing that complements government funds needs to be taken into account. Similarly, the part of investment made by the private sector in public-private consortiums, agreements, partnerships and alliances should be included.

Figure 8.4 shows that in recent years the counterpart of Colciencias funds represented about 55% of the total on average for the main recipients – research centres and public universities, with co-financing rates varied by type of agency. Private contributions to Colciencias-funded projects, however, accounted for 39% of the total in 2012 and 45% in 2013.

In terms of distribution between public and private actors, Figure 8.A1.3 and Figure 8.4 show that public universities are the main recipients of Colciencias funds, followed by private or mixed research centres. Figure 8.7 also indicates that in 2013 the concentration of funds in these two types of agencies increased compared to 2012, with public universities receiving more than half of all Colciencias funds.

Figure 8.4. Distribution of Colciencias funds for agriculture by institution, 2012-13



Source: Consultants calculations based on data provided by Colciencias (2014).

StatLink <http://dx.doi.org/10.1787/888933182140>

There are no apparent barriers to co-operation between researchers working for the government and private-sector researchers. Poor co-ordination and lack of specific incentives to co-operate can limit co-operation and lead to duplication of efforts.

Both Colciencias and Corpórica have mechanisms for co-operation between researchers. While Colciencias does not explicitly support collaboration efforts between government and non-government researchers, its financial support mechanisms promote the creation of partnerships or agreements between companies and technological

development centres or university research groups. This co-financing mechanism supports the performance of strategic programmes or research, innovation and development jointly carried out in the framework of the agreement or association. Colciencias grants a subsidy equivalent to a certain percentage of the total value of the project. Other SNCTI entities such as Sena offer the same model of credit support.

Colciencias also promotes international co-operation more specifically with a programme called corporate technological missions (*misiones tecnológicas empresariales*). With this programme, Colciencias contributes up to 80% of the total value of each proposal.

Its work with supply chains necessitates collaboration with private research centres or at least that researchers make an attempt at co-operation among themselves. The Siembra network was set up by Corpoica to identify which entities (either public or private, national or international) could lend their research experience to help solve specific problems identified in specific chains.

In January 2014, the Siembra platform contained projects carried out by Corpoica (partnerships, agreements, alliances, etc.) with the following entities:⁵

- Fedecacao
- Universidad Nacional de Colombia
- Ciat
- The Swiss Federal Institute of Technology (ETHZ)
- Alquería S.A.

The Cacao Grower Federation is involved in numerous projects, as is Alquería S.A., a private company involved in milk product pasteurisation and marketing. Corpoica (2012) notes that the institution has worked on research in partnerships with CENIs (Cenicafé, Cenicaña, Cenipalma, Ceniflores, Cenibanano, Ceniacua and Conif) and the Colombian Farmer Society (SAC) (Research committee).

Table 8.1 shows the entities or international companies with which Corpoica signed agreements between 2007 and 2013, including several private sector foreign companies (oil and tire companies, and Prophyta).

Table 8.1. Agreements with international companies signed by Corpoica between 2007 and 2013

Companies or agencies	Number of agreements
Meta Petroleum Corp	3
CIAT: Centro Internacional de Agricultura Trópical	8
Prophyta	2
IRD: Institut de Recherche pour le Développement	1
ABC: Agencia Brasileña de Cooperación y otras de Brasil	3
BID: Banco Interamericano de Desarrollo	2
CIP: Centro Internacional de la Papa	2
Sementes Farroupilha	1
IICA: Instituto Interamericano de Cooperación para la Agricultura	1
IRPAT: Instituto para la Reconversión ProduSTIva y la Agricultura Tropical	1
IPES: Promoción del desarrollo sostenible	1
CIRAD: Centre de coopération internationale en recherche agronomique pour le développement	1
MFPM : Manufacture Française des Pneumatiques Michelin	2

Source: Corpoica (2014).

Siembra states that the Universidad Nacional carries out research projects with foreign universities (Hohenheim, Germany; ETHZ in Switzerland), government agencies (United States Department of Agriculture [USDA]) and public agencies (Corpoica; ICA and CIAT). The only commercial company is Vecol, a company with mixed capital, specialised in the production and investigation of veterinary products (mainly for the control of foot-and-mouth disease in livestock) and pest control in agriculture. The institution states on its webpage that research activities are carried out for some of its products.

Cenired, a network grouping the CENIs, created a shared service for intellectual property, Secopi Agro Colombia, under the auspices of Colciencias and the Shared Intellectual Property Service in the Agricultural Sector in Colombia (OMPI). In addition to the CENIs, Secopi includes various public universities (including Universidad Nacional) and other public (Corpoica) and private institutions.

There is no evidence readily available to evaluate the level of co-operation between public and private researchers. The most important experience in terms of co-operation between the public and private sectors has been through parafiscal funds, which finance supply-chain related innovation activities. The governing board of each supply-chain fund includes officials from MADR to ensure that the resource allocations match the objective of the funds.

Public support to private companies

Colciencias does not discriminate between public and private entities when allocating resources. The financing of projects is granted to legal entities, public, private, or mixed, to nationals or foreigners residing in Colombia. It is assumed that almost all the calls made by Colciencias include a subsidy component.

Tax benefits are used to promote investments and donations in science, technology and innovations that will enhance competitiveness and productivity in companies. “Under this modality, if a company liable to submit an income tax declaration and complementary declarations in the country makes investments in research and innovation projects, a tax deduction equivalent to 125% of the amount invested during the taxable period when the investment was made can be granted, but not in excess of 20% of the net revenue (before subtracting the value of the investment).⁶ The same rule may apply when the company makes a donation to a research centre or a technological development centre (non-profit organisation) or to a research centre or research group belonging to an institution of higher learning acknowledged by Colciencias.” (Corpoica, 2013b)

Moreover, research centres may avail themselves of a VAT exemption on the importation of appliances to be used in projects rated as scientific, technological or innovative according to certain criteria and conditions (Corpoica, 2013b).

Other **credit support** instruments are available for SMEs and for the training of human resources. Regarding SMEs, credit for projects of technological innovation and development can be guaranteed by the National Guarantee Fund, with coverage of up to 80% of the credit. FINAGRO has individual and associative loans for producers to invest in technical or productive modernisation. These loans have the benefits of other FINAGRO loans, including Agricultural Collateral Fund (FAG).

In the case of human resources, there are non-refundable educational credits available. Young researchers and innovators are given opportunities to connect with

research groups, technological development centres, technologically based company incubators, etc., via scholarships and internships with a duration of one year. Other incentives include: 1) training abroad is given to innovative managers and R&D personnel; 2) exchange of researchers; 3) financing scientific events; 4) contractual linkage of researchers in companies; 5) financing patent registrations or technologies that can be protected; 6) corporate technological missions; and 7) support to national PhD programmes.

Knowledge infrastructure

Knowledge infrastructure is a public good that can facilitate innovation; it includes general research infrastructure (e.g. ICT) and general purpose technologies (e.g. biotechnology) as well as specific knowledge infrastructure such as databases and institutions.

General infrastructure

It is the government's responsibility to establish the regulatory bases, market organisation, and market regulations (institutional framework) to promote the creation and development of knowledge infrastructures. Regulations in such cases are important because generally these are services rendered under conditions of oligopoly or monopoly. Some services are provided directly by the government, in which case they are implemented by local governments, which in turn may provide incentives to encourage private participation.

Colombia lags behind its regional peers and other emerging economies in infrastructure stock and quality, while access to mobile phones, computers and the Internet is lower in rural areas than in urban areas. The government is making significant efforts to improve this, including a recent large policy boost for investment. Examples of successful institutional frameworks directly created by the state or via incentives, or by an effective institutional framework, are the energy system (electricity, gas and coal, and biofuels [with the active participation of farmers and corresponding agro-industries]) and that of the information and communication technologies (ICTs).

ICTs offer farmers of small holdings effective ways to use cell phones and Internet in addition to developing active communication by means of "apps" (software applications) between technical assistants, producer associations, MADR, chain leaders, etc., on the one hand, and the rural population on the other. With the help of an app, it becomes possible, for instance, to send weather forecasts and other data of interest to a farmer's cell phone.⁷

Physical infrastructure for knowledge

The government (at the central and territorial levels, but mainly involving public universities) directly generates and utilises research and the development infrastructure in buildings, laboratories, farms or pieces of land for experimentation, libraries, information systems on available technologies, co-ordination and information networks between different actors (mainly for the supply chains).

- The main governmental entity in charge of this task is **Corpoica**. As noted previously, this institution has several centres and experimental stations with many laboratories throughout the country. It has a major information network, including the Siembra

platform and the Agricultural Library of Colombia (*Biblioteca Agropecuaria de Colombia*), with an information system that includes technological recommendations for 32 agricultural products in ten supply chains.

- **Universidad Nacional** stands out in the provision of self-owned infrastructure for research and experimentation, with branches in several cities. The university has significant agricultural research capabilities: one-quarter of research groups registered in Colciencias in 2011 are from Universidad Nacional. The university has the following research centres connected with the agricultural sector: CECIMAR, Centro de Estudios en Ciencias del Mar (Santa Marta); Marengo, Centro Agropecuario (Mosquera); CIER, Centro de Investigación y Extensión Rural (Bogota); Centro Virtual de Plantas Transgénicas; Centro Experimental de la Universidad Nacional in Palmira; IDEA, Centro de Estudios Ambientales; Instituto de Ciencia y Tecnología de Alimentos; Instituto de Biotecnología.
- One of the main purposes of **Colciencias** is to provide financial and technical support (to the private sector, but also to public universities and public R&D Centres) for the creation and strengthening of research centres and laboratories, technological parks, biological collections, libraries, experimental farms, pilot plants, software programmes, and databases on genetic aspects in plants and animals, networks for climate information and environmental issues, among other aspects.

Poles of excellence

Poles of excellence are knowledge infrastructure which focus resources on specific issues through cross-sector collaboration. At present there are three excellence research centres with some connection to the agricultural sector and which are accredited and supported by Colciencias (Box 8.2).

Box 8.2. Colombian Centres of Excellence

CENIVAM: The core objective of this group is to establish the scientific and technological knowledge needed to develop an essential oils, extract and natural derivative agro-industry that would be geared towards the production of high-yielding goods capable of competing on domestic and world markets. This joint venture includes the following institutions: Universidad Industrial de Santander (public), Universidad de Antioquia (public), Universidad Tecnológica del Choco (public), Universidad de Cartagena (public) and Universidad Tecnológica de Pereira (public).

CIEBREG (Centre for Research and Study in Biodiversity and Genetic Resources): It is expected that the project will develop a methodology supporting the formulation of policies for the payment of environmental services and incentives to local actors who will adopt agroforestry-coffee growing systems, cattle breeding-silvopastoral systems and who will establish agroforestry corridors with bamboo groves. The following institutions are part of the joint venture project CIEBREG: Universidad Tecnológica de Pereira (public), Pontificia Universidad Javeriana (private), Centro para la Investigación en Sistemas Sostenibles de Producción Agropecuaria (private) and Instituto de Investigaciones Alexander Von Humboldt (public-private).

Box 8.2. Colombian Centres of Excellence (cont.)

GEBIX (Genome Platform in External Environments): Explorations are carried out in the National Natural Park of Nevados (*Parque Nacional Natural de los Nevados*), part of the national park system, where little research has been made on microbial diversity. Analysis of diversity: DNA obtained from water and soil samples to assess microbial diversity. Bioprospection: metagenomic libraries of soil DNA have been built and used to detect enzymatic activities. Metagenomic analysis: metagenomic soil DNA of the forest floor and of the El Coquito hot springs have been sequenced and are currently being analysed. Microbial collections: as a complement to the independent analysis of the crops, samples were also collected and different microorganisms were isolated in some of these habitats. Collections are now kept of different microorganisms. Intellectual property rights: work is underway on intellectual property issues and the appraisal of intangibles derived from the work developed. GEBIX is composed of the following universities: Universidad Nacional (public), del Cauca (public), del Valle (public), Pontificia Javeriana (private), de Caldas (public) and de los Andes (private), as well as Corporación Corpogen (private).

Source: www.colciencias.gov.co/noticias/colciencias-mantendr-su-apoyo-los-centros-de-investigaci-n-de-excelencia (accessed 3 January 2014).

Gene banks

Corpoica manages three gene banks for crops (36 000 references), animals and micro-organisms (405 000 references) respectively. They include domesticated or exotic species that are used for farming and which are not covered by the law on the protection of biodiversity.

Knowledge flows: The role of networks and markets

Intellectual property protection, knowledge networks, and knowledge markets are of growing importance in fostering innovation as they stimulate innovation and facilitate co-operation between innovation actors.

Intellectual property rights (IPR) management

Intellectual property protection

Intellectual property rights are protected in Colombia by national norms, shared Andean norms and international norms. Also, the Constitution of 1991 rules, in Article 61, that “the state will protect intellectual property for the defined period and by means of the formalities set in the law”.

- The protection that Colombian law grants to **copyrights** covers any and all forms in which ideas may be conveyed, does not require any type of registration and remains in force for the entire lifetime of the author plus 80 additional years after his/her death, after which time it is transferred to the public domain. Registration is with the National Directorate for Copyrights (which has the sole purpose of providing greater legal safety to the copyright holders).⁸
- In the case of **software**, Colombian legislation draws a parallel with writing a literary work, allowing the source code of a programme to be covered by copyright law.
- **Industrial property** concerning patents is the protection exercised on **ideas that are applicable in any activity of the production or service sectors**, granting protection for a

limited time to ensure its exclusive economic exploitation (around 20 years). In Colombia, formalising such protection requires submitting a formal registration with the Superintendence for Industry and Commerce.⁹

- The **Andean Community** of Nations has a Common System for the Protection of the Rights of Obtainers of Plant Varieties (*Régimen Común de Protección de los Derechos de los Obtentores de Variedades Vegetales*). Decisions grant the obtainer the exclusive marketing rights of the product for a period of 20 to 25 years in the case of grapevines, forest trees, and fruit trees, including their rootstocks. For the remaining species, it is 15 to 20 years counted from the date of its bestowal, as the national authority may determine.
- Colombia has been a member of the International Convention for the Protection of New Plant Varieties (**UPOV**) since 1996. It has approved UPOV 78, but not UPOV 91, which strengthens property rights.
- The **Common System for Access to Genetic Resources** (*Régimen Común sobre Acceso a Recursos Genéticos*) was approved by the Cartagena Agreement Commission in 1996, with the purpose of ensuring the participation of Andean Community countries in the benefits derived from the use of energy resources. According to it, anyone who desires to use or to develop active ingredients contained in plants and microorganisms (which constitute the foundation for research in the pharmaceutical industry and food industry worldwide) must have authorisation and must sign an Access Contract (*Contrato de Acceso*) with the state. The community rule acknowledges expressly the rights to which natives, Afro-Colombians and local communities are entitled regarding their traditional knowledge, innovations and practices associated with energy resources and products derived therefrom.

Figure 8.5 lists the institutions that are part of the intellectual property system. According to the World Economic Forum Global Competitiveness Indicator, intellectual property protection in Colombia is lower than in Brazil, Chile or Mexico, but higher than in Argentina or Peru (Figure 8.6). Patent protection has increased since the mid-1990s and is now similar to that in Argentina, Brazil and Mexico, while plant variety protection is higher than in those countries.

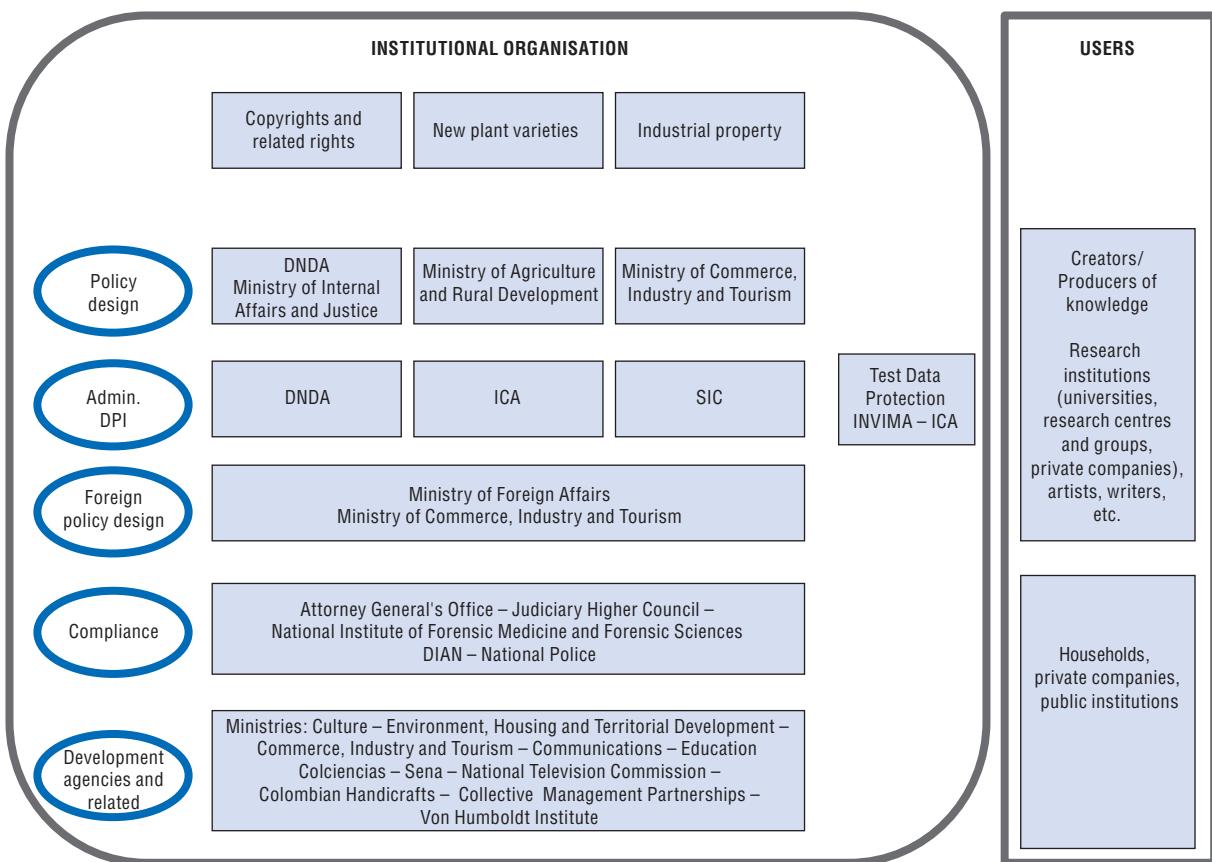
Sharing of Intellectual Property Rights

The Colombian legislation¹⁰ covers the different modalities to engage in partnerships for scientific and technological activities, research projects and the creation of new technologies. They depend on the type of association to be created between state institutions and the private sector. There are also clear rules regarding the handling of IPRs in public universities (see Annex 8.A3 for information on rules governing IPR allocation between partners and between organisations and employees).

Intellectual property management responsibilities

There are, in general, two institutions responsible for intellectual property matters: the National Directorate for Copyrights (DNDA) and the Superintendence for Industry and Commerce (SIC) – Intellectual Property Department. DNDA is the entity in charge of the recording and defence of copyrights. The SIC provides consultation and information services on industrial property. In addition, SIC offers online transaction services for industrial property.

Figure 8.5. Intellectual property system



Note: See list of acronyms.

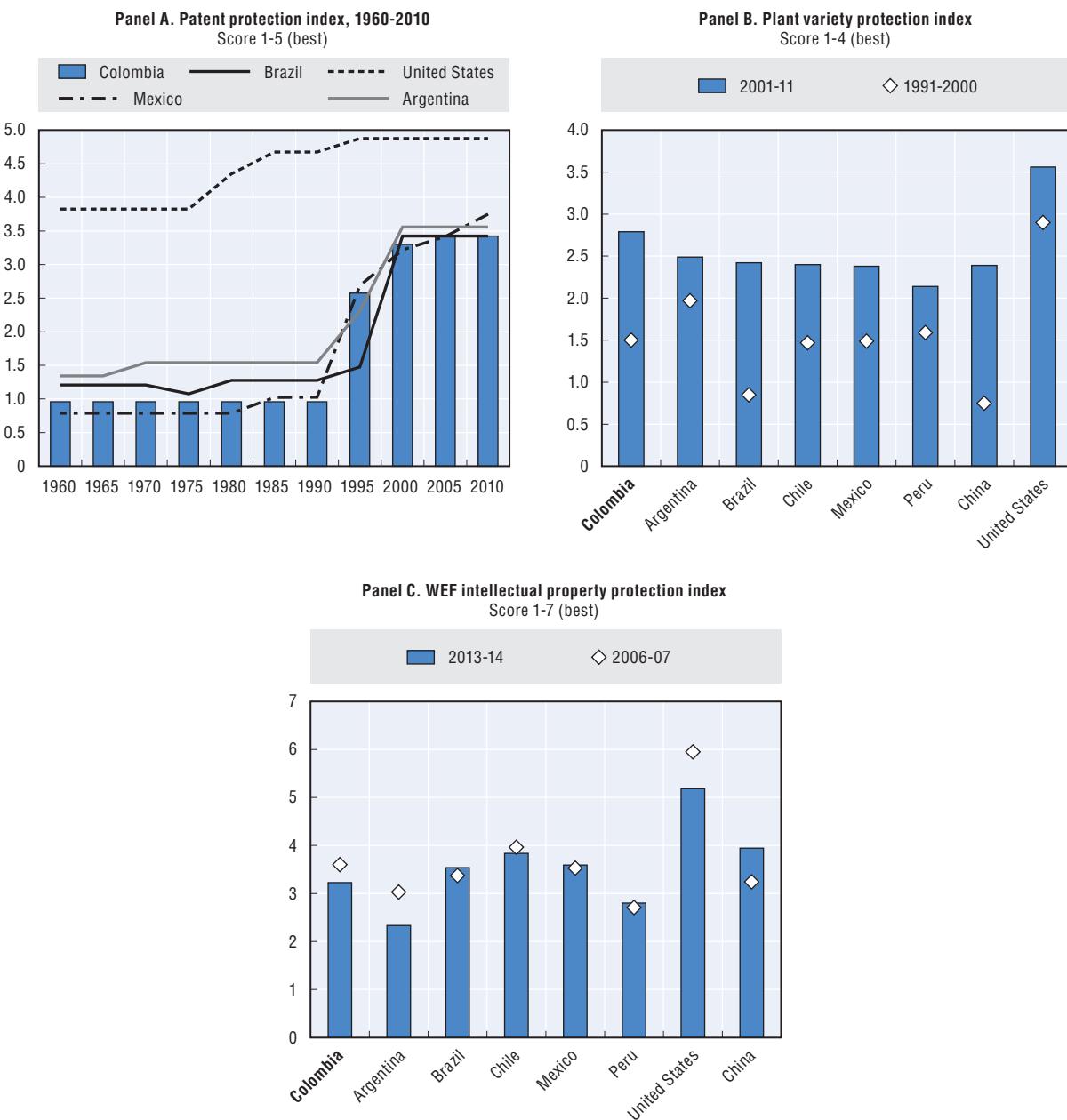
StatLink <http://dx.doi.org/10.1787/888933182155>

For the agricultural sector, Colciencias, MADR, Corpoica, the ICA and other public and private entities can provide advice on matters of copyright and industrial property. Colciencias has an IPR consultant and promotes the Shared Intellectual Property Service in the Agricultural Sector (SECOPI AGRO).¹¹ SECOPI offers training courses in DPI and attempts to achieve the following objectives: 1) facilitate the legal protection of the results of the researches and ensure their ownership; 2) provide support in the management and marketing of the outcomes of the research; 3) promote mutually beneficial public-private associations; 4) stimulate the financing of science, research and teaching.

Sharing of knowledge

Sharing information and reinforcing linkages across participants in the agricultural innovation system (researchers, educators, extension services, farmers, industry, NGOs, consumers and others) can help match the supply of research to demand, facilitate technology transfer, and increase the impact of public and private investments. Partnerships can also facilitate multi-disciplinary approaches that can generate innovative solutions to some problems.

Figure 8.6. Intellectual property protection



Source: Panel A: Unpublished update to the series from Park (2008), "International Patent Protection: 1960-2005".

Panel B: Campi and Nuvolari (2013), "Intellectual property protection in plant varieties: A new worldwide index (1961-2011)", <http://hdl.handle.net/10419/89567>.

Panel C: World Economic Forum (2014), "Global Competitiveness Report 2013-14", www.weforum.org/reports/global-competitiveness-report-2013-2014.

StatLink <http://dx.doi.org/10.1787/888933182164>

Access to knowledge policy

Corpoica has a free-access policy to the outcome of research projects in science and technology; documents describing best practices resulting from the completed research projects can be downloaded from the Siembra network website.

Public universities have a free-access philosophy, but depending on the agreements with other institutions or with private companies, they have restrictions in terms of intellectual property rights. As R&D performers, public universities are entitled to share intellectual property rights as agreed in the partnerships or contracts subscribed with other institutions.

Colciencias is governed by the provisions of Agreement No. 008 of 2008 issued by the National Board for Science and Technology, which ruled, in accordance with the law recorded in the Development Plan for 2010-14, that the intellectual property rights generated in projects financed by Colciencias with resources from the national budget belong to the executing entities, except in areas of special sensitivity. Therefore, Colciencias is entitled to receive licenses free of charge that will allow the institution to exploit such rights, directly or indirectly.

When there are DPI owners involved in STI activities, the agencies responsible for the supply of statistical data are subject to the restrictions imposed by such DPIS. In any case, unless it is a business secret, the data on patents is freely accessible in the Superintendence for Industry and Commerce (SIC), a public institution responsible for the recording and defence of intellectual property rights in Colombia.

Colciencias maintains a list of researchers' curricula vitae, as well as lists of research groups research centres, and technological development centres, on evaluating peers and registered publishing houses. These are free-access, free-of-charge data. For studies and analyses on the status of SNCTI and SNCTA, the Observatory of Science and Technology maintains updated information, which is also free-access and free of charge. In all the above cases, copyrights are to be observed even if the property rights are surrendered.

Information networks and databases

Information networks have multiplied in Colombia and in the agricultural sector. These have a long track record in the country, going back to the 1970s. Some are directly financed by the government (those networks belonging to public entities), while others derive from partnerships or agreements between multiple entities, both public and private. A list of government and other networks is found in Annex 8.A4.

The most important agency in the country in terms of collection, systematisation and publication of statistics on science and technology is the **Colombian Observatory for Science and Technology** (OCyT),¹² a public-private institution. It makes data available free of charge to all SCNTI agents, as well as databases and indicators on, for example, investment and human resources for research, bibliometrics, innovation, industrial property and social appropriation of science and technology.¹³

The **National Administrative Department of Statistics** (DANE) carries out surveys on technology and innovation in some economic sectors (in the manufacturing and service sectors to date). It is expected that it will also cover the agricultural sector as it is currently performing an agricultural census throughout the country; this will facilitate the design of representative surveys. It is DANE policy to publish its statistics, with free access to some. As a result of budget restrictions, the institution charges for the provision of a high percentage of the statistics available.

Corpoica and UPRA are developing with the Geographic Institute an agronomic and socio-economic map of Colombia, which should help identify the potential for agricultural development in each area.

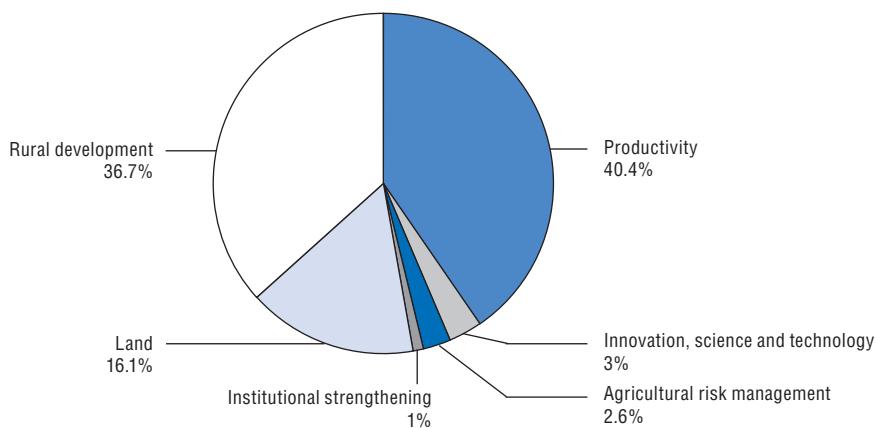
International co-operation

International co-operation on agricultural research and development offers universal benefits. While this is generally true given the public good nature of many innovations in agriculture, it is particularly the case where global challenges are being confronted (as in the case of responding to climate change) and when initial investments are exceptionally high. The benefits of international co-operation for national systems stem from the specialisation it allows and from international spill-overs. In countries with limited research capacity, scarce resources could focus on local specificities.

Strategy for international co-operation

At the end of 2012, MADR designed a strategy for international co-operation for the following three years (MADR, 2013). The areas prioritised for the years 2011 and 2012 are shown in Figure 8.7. According to fund allocation, the main priority is increasing productivity (40%), followed by rural development (37%). Innovation, science and technology received 3% of all co-operation funds.

Figure 8.7. Distribution of funds for co-operation by strategic priority, 2011-12



Source: MADR (2013), “Estrategia de Cooperación Internacional del Sector Agropecuario 2013-2015”.

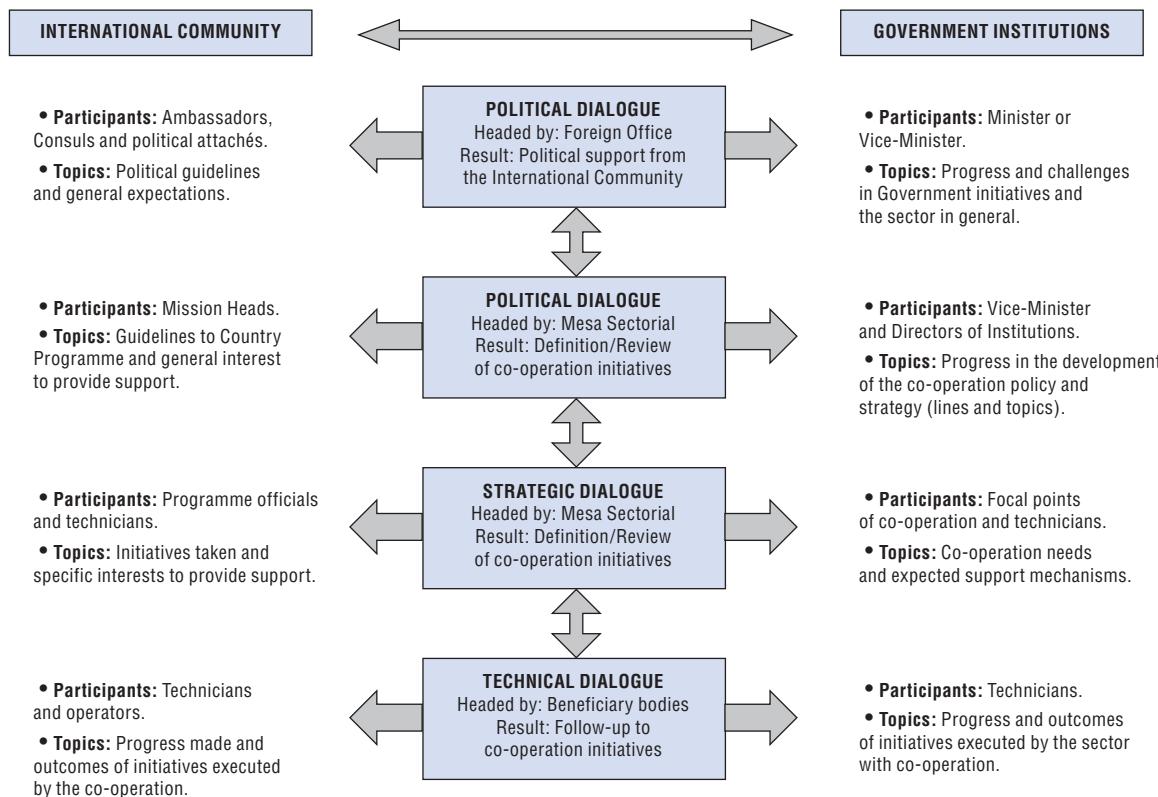
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The following themes have been established in the strategy:

- In productivity: marketing, production and processing activities, integral technical assistance, financing and the fishery and aquaculture sectors.
- In STI: linking of research outcomes to the production sector; access to genetic resources, intellectual property and traditional knowledge; national research agenda; validation of cutting edge technologies in agro-industrial production; sanitary matters; biodiversity; agro-energy; sustainability of the agricultural production; adaptation and mitigation of climate phenomena.

MADR's strategy includes “spaces of dialogue” between the international community and the government institutions, as well as a work path to translate the strategy into co-operation initiatives. These spaces of dialogue include political, policy, strategy and technical facets (Figure 8.8). The work route includes general meetings between the MADR and other entities in the sector mentioned in endnote 13, with a frequency of three times a year, and “Theme Tables” meetings every six months by strategic line, formed by the government entities interested in receiving international co-operation funds.

Figure 8.8. Spaces of dialogue with the international community for international co-operation



Source: MADR (2013), "Estrategia de Cooperación Internacional del Sector Agropecuario, 2013-2015".

StatLink <http://dx.doi.org/10.1787/888933182183>

The private technological research and development centres are totally free to establish agreements or to carry out co-operation projects with foreign institutions. As an example, Cenired states that the CENIs maintain a “narrow contact and co-operate in different projects with other entities in different countries”, citing the following as examples:

- Cenicaña and Consorcio Internacional de Biotecnología de la Caña de Azúcar.
- Ceniacua and Akvaforsk de Noruega, world leader in the genetic improvement of aquatic species.
- Cenicafé with the University of Cornell (molecular biology), the University of Maryland and the IRD in France.

Exchange of researchers

In the Strategy for International Co-operation (*Estrategia de Cooperación Internacional – CI*) of the agricultural sector, one of the functions of the Science and Innovation Theme Tables (*Mesas Temáticas de CI*) (entities interested in receiving CI) is to “formulate, together with the development workers, concerted co-operation initiatives, assuring the link-up of the technical experts in the entities involved”.

Colciencias has its “Colciencias International Group (*Grupo Internacional de Colciencias*) (as) a transversal unit for the management and promotion of Colombian STI before the national and international authorities, (...) has an internationalisation strategy (...)

facilitating the access of national research and technological development groups and Centres to intellectual and financial resources at the regional or international level, thus rendering the inclusion of the Colombian STIs in international nets easier".¹⁴

It should also be remembered that Colciencias has a number of financing instruments for researchers and scientific missions, based on co-operation agreements or partnerships with international entities. The main ones are mentioned below:

Educational Credits: Colciencias has been working together with institutions in other countries to support students desirous to attend high-level studies abroad. Examples of such institutions are the Fulbright Commission of the United States, the German DAAD and LASPAU (*Academic and Professional Program for the Americas*).

Interchange of Researchers: This Colciencias initiative is directed toward foreign teachers or scientists supporting research projects carried out by Colombian professionals in the framework of PhD programmes; these act as jurors or tutors for doctoral theses, or alternatively are linked to national PhD programmes where they give courses or modules as part of their study plan. This applies also to teachers/professors who are researchers in national PhD programmes and who may need to move abroad to develop activities inherent to their research activity, or those who may need to improve their performance abroad to the benefit of the PhD programme.

Scientific Event Financing: National and international scientific and academic events are co-financed by means of public calls directed to SNCTI authorities. This support makes it possible to finance the travel expenses of national and international guest speakers, the advertisement of the event and the publication of event proceedings.

Business Technological Missions (*Misiones Tecnológicas Empresariales*): This programme is aimed at, among other objectives, supporting the transfer of the integral knowledge of international companies and centres known for their excellence; promoting the building of business relations and strategic alliances with the participation of technological centres, researchers and entrepreneurs from other countries; co-financing the participation of researchers and innovators with presentations, systematised experiences and proposals accepted in international technological events.

Researcher Mobility (*Movilidad de Investigadores*): This programme attempts to promote "scientific and technological co-operation by financing (in total or in part) the international air tickets of researchers and innovators who, taking advantage of their attendance to an event outside of their country, will develop complementary co-operation agendas". This includes paying for foreign visitors to travel to Colombia as guest speakers in scientific and technological events, and to pay for Colombian researchers and innovators (resident in Colombia) to attend scientific and technological events held out of the country as guest speakers.

Participation in regional and international networks

Colombia is directly involved in CGIAR through CIAT (International Centre for Tropical Agriculture), a research centre located in Colombia.

Also, Colombia has participated in the Global Forum for Agricultural Research (*Foro Global de Investigación Agropecuaria – FGIA/GFAR*) and in its equivalent for the Americas – FORAGRO.

Colombia is a beneficiary of the activities of the Inter-American Institute for Cooperation in Agriculture (*Instituto Interamericano de Cooperación para la Agricultura*, IICA), which has an office in Colombia (Innovagro).

Colombia is a member of the Tropical Agronomy Centre for Research and Learning (CATIE). It has co-operation partnerships with International Cooperation Centre for Research in Agronomy (CIRAD). Colombia participates in the Consortium for the Sustainable Development of the Andean Ecologic Region (*Consorcio para el Desarrollo Sostenible de la Ecoregión Andina*, CONDESAN) through various national institutions (Universidad Nacional, IDEAM, Inst. A. von Humboldt).

Colombia has been a beneficiary of the International Fund for Agricultural Development (FIDA), which has funded projects in the country.

Colombia is a member of the Regional Fund for Agricultural Technology (*Fondo Regional de Tecnología Agropecuaria*, FONTAGRO) together with other countries: Argentina, Bolivia, Chile, Costa Rica, Ecuador, Spain, Honduras, Nicaragua, Panama, Paraguay, Peru, Uruguay, Dominican Republic, Uruguay and Venezuela. FONTAGRO is an alliance between countries established to finance research and scientific innovation in the agricultural sector.

Colombia also joined the Global Research Alliance on Agricultural Greenhouse Gases launched in 2009.

Promotion of co-operation

Colciencias has several instruments in place to promote co-operation between research centres and groups, as well as between these entities and researchers. The same applies to co-operation activities between the centres mentioned above and public and private universities. These instruments have been described in previous sections.

Also, developments in the private sector have benefitted other private (non-competing) sectors. Just to mention one example, Cenired states that the CENIs “have contributed, not only to the development of their own sectors... but also promoted and strengthened scientific progress in the country”. Other producer associations and the universities “use the experiences gathered (by the CENIs) as a model to obtain the technological support required. As an example, let us mention the cattle ranchers and grain farmers, as well as the producers of bamboo and rubber who, with the mediation of Colciencias, have come to the CENIs to assess successful research models” (Gutierrez, 2013).

In 2012, foreign nationals involved in STI activities in Colombia accounted for close to 5% of the total number of researchers (Table 8.2).

Table 8.2. Number of researchers involved in STI activities in 2012

Degree	Colombians	Foreigners	Grand total
PhD	730	134	864
Master's Degree	1 489	23	1 512
Not defined	1 633	82	1 715
Postdoctoral	17	10	27
Undergraduate/Graduate	1 118	4	1 122
Grand Total	4 987	253	5 240

Source: Information provided by Corpoica, Observatorio del SNCTA (2012).

Summary

- There is a diversity of sources for public funding of R&D activities, which are complemented by significant contributions from parafiscal fund and royalties, but there is little co-ordination between these different sources.
- Priorities for agricultural R&D activities are established to guide the allocation of public funds. A large proportion of funds is allocated to projects through open calls. This mechanism often results in resource allocations being driven by supply, i.e. offers made by researchers or research institutions.
- The co-financing model encourages co-operation between different institutions and there are no apparent barriers to co-operation between researchers or research institutions, whether public or private, national or foreign residing in the country. However, the mechanism used by Colciencias to allocate funds to projects favours competition rather than co-operation between researchers. Moreover, the fragmentation of institutions and poor co-ordination may lead to duplication of efforts.
- There is little information on the contribution of agri-business to research efforts for the agricultural sector. Public support to investment in science, technology and innovation in private companies includes tax benefits and credit support. Credit programmes are also used to support education and training.
- A system to secure and manage IPRs has been established, and continues to be developed, to foster innovation and partnerships, and to improve access to foreign innovation. For example, there are clear mechanisms regarding the sharing of IPRs between partners and between employers and employees. Patent protection is similar to that in neighbouring countries, but lower than in most developed countries, while plant variety protection is co-ordinated at the Andean level. Colombia did not sign the most recent international agreement (UPOV 91). Efforts are being made to share information and assist researchers in handling their IPRs.
- Sharing of knowledge is facilitated through free access to knowledge policy (within the limits of intellectual property protection) and the development of a number of information networks. The multiplication of network databases, however, could be a challenge in terms of access to information by non-experts. Clarifying the mandate and coverage of databases to avoid duplication would facilitate access to information and knowledge flows.
- Co-operation is developed at the national and international levels. There is a government strategy regarding international co-operation that ensures dialogue at various levels of the agricultural innovation system, from policy to strategy to technical levels. It also includes support for exchanges of students and researchers. Colombia hosts a number of international research centres and is a member of international research partnerships and networks. Corpoica and the CENIs are involved in partnership projects with foreign companies, research centres and universities.

Notes

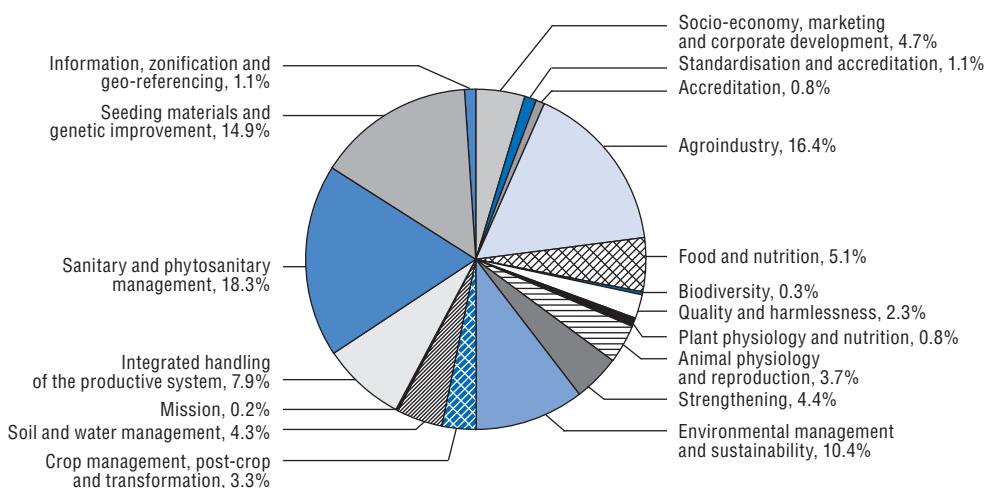
1. There is ample discussion on whether parafiscal funds should or should not be considered public resources: they have a legal origin, yet are nothing short of mandatory contributions made by each producer in a subsector of agricultural production for the benefit of all producers who are part of said subsector.
2. See www.colciencias.gov.co/faq (accessed 12 December 2013).
3. www.siembra.gov.co/siembra (accessed 9 December 2013).
4. This is carried out at the municipal level with the supply chains that were rated as priorities.
5. See Siembra platform, www.siembra.gov.co (accessed 4 January 2014).
6. Tax benefits are regulated by Article 161 of Law 1 607, 2012 (Operating Rule of the National Board for Tax Benefits in Science, Technology and Innovation; CNBT).
7. An app is a programme installed in a mobile device – either phone or tablet – which can be updated so as to add new features as time goes by. The devices provide instantaneous access to a specific topic without the need to search it on the Internet and, once installed, can generally be accessed without having to connect to the Internet.
8. www.derechodeautor.gov.co/ (accessed 1 November 2013).
9. www.sic.gov.co (accessed 1 November 2013).
10. Legislative Decrees 393 and 591 of 1991.
11. Servicio Compartido de Propiedad Intelectual en el Sector Agropecuario, www.secopiagro.org (accessed 5 December 2013).
12. Created in 1999 by public and private initiatives, OCyT is a non-profit organisation having as its objective the production and publication of SNCTI statistics and indicators, http://ocyt.org.co/html/index.php?option=com_content&view=article&id=45&itemid=54&lang=es (accessed 3 January 2014).
13. Its promoters in 1999 were four public institutions – Colciencias, DNP, Universidad de Antioquia, and Universidad del Cauca – and three private institutions – Universidad Javeriana, Universidad de los Andes, and Universidad del Bosque.
14. See www.colciencias.gov.co/programa_estrategia/internacionalizacion-de-la-cti (accessed 10 January 2014).

ANNEX 8.A1

Allocation of public funds by theme, organisation and type of institution

Figure 8.A1.1 shows that over the period 2002-13, the largest shares of Colciencias resources were allocated to: sanitary and phytosanitary management (18%), agro-industry (16%), seed management and genetic improvement (15%), environmental management and sustainability (10%) and production system integrated management (8%).

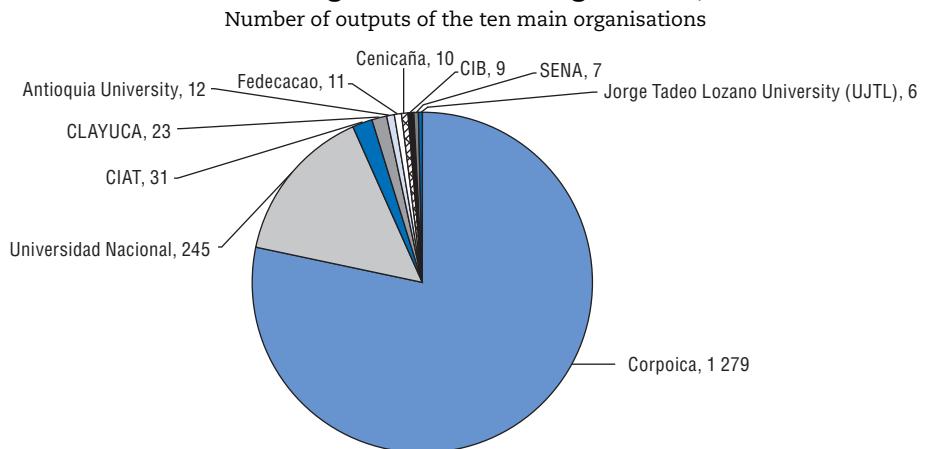
Figure 8.A1.1. Colciencias: Funding rate of agriculture-related R&D by thematic areas, 2002-13



Source: Corpoica (2013a), "Lineamientos de política en materia de inversión pública para la I+D+I en el sector".
StatLink <http://dx.doi.org/10.1787/888933182198>

Regarding the allocation of funds by institution, Figure 8.A1.2 shows that Corpoica dominates funding over three-quarters of the total number of outputs. Among the ten most important organisations dedicated to research in science and technology in 2013, three were universities and one was a centre for research on biological issues from one of these three universities. Out of 1 658 projects completed, 272 were carried out by these universities (16%).¹ However, when considering Colciencias funding alone, public universities receive as much funding as research and technological development centres (either private or mixed), and both types of institutions receive the majority of funds (Figure 8.A1.3).

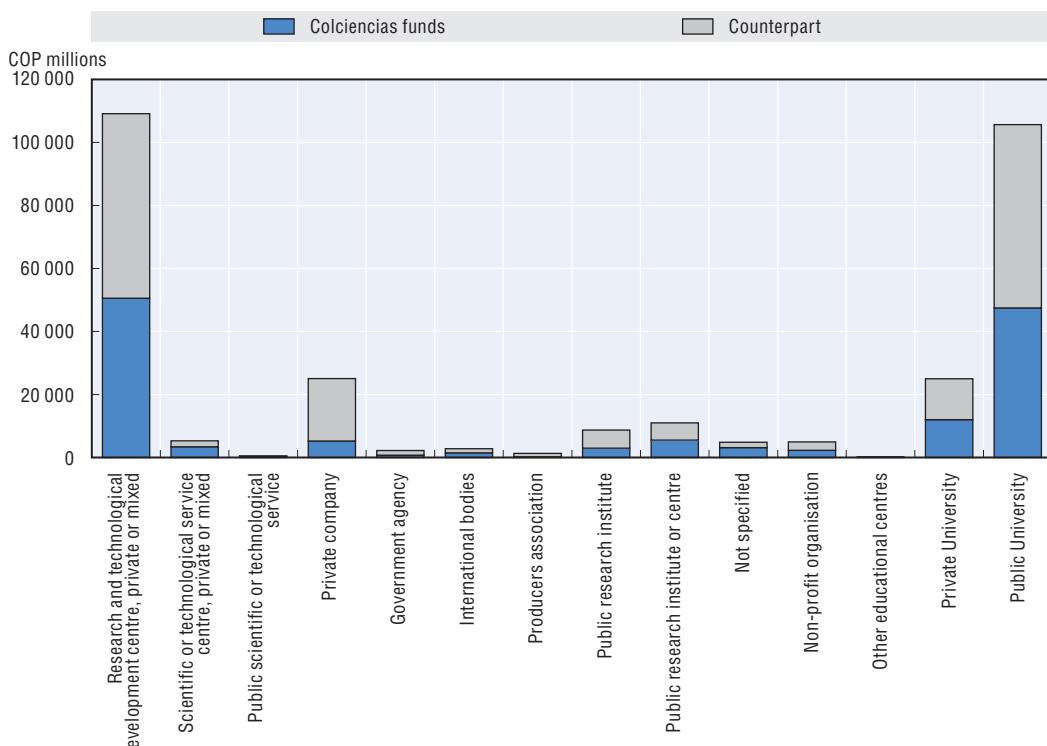
Figure 8.A1.2. SIEMBRA – Main organisations involved in scientific and technological research on agriculture, 2013



Source: Siembra, www.siembra.gov.co/ (accessed 9 January 2014).

StatLink <http://dx.doi.org/10.1787/888933182208>

Figure 8.A1.3. Colciencias budget for agriculture by type of institution, 2011-13



Source: Corpocica (2013a), "Lineamientos de política en materia de inversión pública para la I+D+I en el sector".

StatLink <http://dx.doi.org/10.1787/888933182218>

Note

1. The figures for other universities or higher education institutions are not currently available. There is no processed information available on all the entities involved in and taken into account in the Siembra platform, nor is it known if these are public or private. The handling of such information by computer is very time-consuming given that the data per Project is organised in 166 electronic spreadsheets, each one of these containing data on roughly 20 projects.

ANNEX 8.A2

Allocation of funds from the General System of Royalties (SGR)

The steering committee of the SGR is in charge of establishing general policies, making budget recommendations, and defining processes, procedures, formats and criteria for the functioning of the SGR, as well as analysing SGR evaluation reports (presided by DNP).

The management of SGR resources is by the Ministry of Finance. The monitoring, control and evaluation of SGR are carried out by the DNP, which has the authority to apply preventive, corrective and punitive measures.

The Collegiate Body for Administration and Decisions (OCAD) is the decision-making body that decides on regional projects approved by regional bodies (i.e. regional competitiveness plans, departmental STI plans, regional development plans, etc.). It is composed of four national government representatives, representatives of the local government(s) involved and six representatives of public and private universities. Each of these groups has one vote; Colciencias is in charge of the Technical Secretariat (Laws 1530 and 1606 of 2012).

The criteria used by OCAD to decide whether to authorise a STI project or programme reviewed by the corresponding regional bodies and approved by Colciencias are the following:

- National coverage, with preference for projects or mega-projects with the participation of more than one department.
- Regional equity.
- Impact on regional and national development (PND).
- Existing regional capabilities for STI.
- Existing vocations and potential.
- International projection and competitiveness.
- High-yielding sectors.
- Interdisciplinary capability.
- Capability for cross-sector linkage.
- Risk analysis (institutional agreements, leadership, consensus).

Projects and programmes submitted for approval to the corresponding regional OCAD must fulfil several preconditions:

- Fit into the National Development Plan and the development plans of territorial institutions.
- The technical committees of each OCAD and other relevant actors identify and prioritise in advance via regional planning meetings initiatives and/or projects that could be financed with royalty resources.
- Every natural and legal person, public or private, is entitled to submit investment projects in compliance with the legal formalities required by the corresponding territorial authorities.
- Each project submitted must be based on the methodology defined by the DNP.
- Any investment project submitted and that is to be financed with resources derived from the SGR must be duly checked for feasibility. It is registered in the National Royalty System Programme and Project Bank under the supervision of the National Planning Department or alternatively in the Investment Programmes and Projects of the System administered by the territorial authorities.
- Colciencias verifies that requirements for the approval of investment projects to be submitted to the OCADs have been met.
- The investment projects are then presented by the territorial authorities to the respective OCAD, together with the pertinent studies and background information once these have been reviewed for compliance with the above-mentioned characteristics and harmonisation with the territorial development plans.
- The projects and/or programmes are studied by the OCADs, who make the final decisions.

ANNEX 8.A3

Rules governing the sharing of Intellectual Property Rights in public research institutions

Article 31 of Law 1450 of 2011 on intellectual property rights in partnerships or research agreements financed with national budget resources states that: "In the case of science, technology and innovation projects carried out with national budget resources, the State will yield the intellectual property rights (IPRs) that it may be entitled to have as specified in the contract, except for reasons of national security and national defence. The Parties involved in the Project will decide among themselves about the ownership of the intellectual property rights derived from the outcomes of the execution of resources received from the national budget." For this article to be applicable, it is a requirement that the projects in question be exclusively science, technology and innovation projects and that these be financed by the national budget. This applies to public entities such as Corpoica and Colciencias.

In Agreement No. 008 of 2008 of the National Board for Science and Technology, the clause governing the management of IPRs stipulates that: "The intellectual property rights over the outcomes obtained in the framework of this research or innovation project will belong to the EXECUTING ENTITY OR ENTITIES, unless otherwise agreed by the parties. In the case of research projects in areas considered as sensitive by the National Board for Science and Technology, Colciencias is entitled to receive the licenses, free of charge, allowing it to directly or indirectly exploit the rights mentioned above." "The ownership of the intellectual property rights generated by the outcomes obtained in the framework of the project will belong to the parties proportionately to their participation in the financing of the project" (MinTIC, 2012).

Rules regarding the handling of IPRs in public universities are as follows:

- "Property rights on works created by public servants of the Educational Institution, teachers or non-teachers, in abidance of the constitutional, legal and statutory obligations of his/her office are owned by the Entity by mandate of the law, without prejudice to the provisions of moral rights. Moral rights belong to the teacher or public servant of the Institution."
- The rights on industrial creations generated by teachers and public servants in the Institution in the fulfilment of their constitutional or legal obligations or as a part of institutional research projects are the property of the Institution and the financing bodies. The inventor has the moral right to be mentioned as such in the patent of invention and the utility model, in the industrial design record and in the designs of integrated circuits, and may also oppose being mentioned.

- Property rights on the new plant varieties obtained by teachers and civil servants are with the Institution they work in and/or the financing bodies, in compliance of their constitutional and legal obligations, or as a part of institutional research projects. Moral rights belong to the individuals or groups of individuals who produced the new plant variety.
- The Institution and/or co-operating or financing entity, as established by prior signed contract, is also the proprietor of the outcomes of scientific and technological research projects carried out by its teachers, servants, students, monitors or natural or legal persons hired for that purpose." (MEN, 2010).

ANNEX 8.A4

Information networks available in Colombia

In the agricultural sector, free-access, free-of-charge networks owned by the government include:

- **Agronet:** A strategic information and communication network operated by the MADR, designed to gather all types of data by supply chain (mainly data on actors, programmes and projects, organisational structure, production and price statistics, etc.), including a module on innovation. It is an interactive network for participants.
- **Siembra:** A Corpoica network currently undergoing a consolidation process aimed at collecting all data generated in Colombia regarding research in science, technology and innovation for the different supply chains. It is interactive for actors participating in SNCTA.¹
- **Ridac** (Colombian Agricultural Documental Information Network): A module of Agronet. Agronet has the purpose of promoting “access to bibliographic scientific, technical and academic in the sector”²
- **Linkata:** A module of the Siembra network, with a strategic role in the transfer of new technologies to farmers. Linkata is an “interactive virtual space where technical assistants of the agricultural sector have an active participation to build, share, design and disseminate data and knowledge pertaining to the agricultural sector in the framework of the Sub-system for Technical Assistance (*Subsistema de Asistencia Técnica*).”
- **OCyT:** The Observatory of Science and Technology collects all aggregate data of the National System for Science, Technology and Innovation.
- **Observatorio Laboral de la Educación** records, processes and analyses available data on higher education in Colombia and its relation with the labour market.

Other networks of a mixed nature (public/private) include:

- **Red de C&T Agrícola:** The Colombian Information Network on Agricultural Science, Technology and Related Activities (*Red de Información en Ciencia y Tecnología Agrícola y Afines de Colombia*) is a component of Agronet, created co-operatively by a considerable number of public and private entities³ with the purpose of “articulating a horizontal documental information system capable of ensuring the organisation, recording and dissemination of data.” It also aims at promoting the interchange of documental information and strengthening the institutional data units participating in the network.
- **Renata** is an advanced technology network connecting, communicating and providing co-operation between the Colombian academic and scientific community and the

international academic community and the most advanced research Centres in the world. It is a member of Regional Academic Networks (*Redes Académicas Regionales*), established by regions and including a large number of public and private universities), the Ministry of Education, the Ministry of ICT and Colciencias. Its scope is vast and includes agricultural themes.

- **Network for Intellectual Property Management** (*Red de Manejo de la Propiedad Intelectual*), which aimed at strengthening research capabilities in the agricultural sector and providing services and support to research Centres for the protection, management and marketing of their research outcomes. This network includes **Secopi**, Shared Intellectual Property Services. Both were created in 2010 and are co-ordinated by Cenired with the support of Colciencias, the World Intellectual Property Organisation (WIPO) and the co-operation of the Superintendence in charge of the registration and defence of intellectual property in Colombia (SIC).⁴

Notes

1. Corpoica carries out a double task regarding information on R&D, as it also makes available free of charge, the results of the specific researches but not to aggregate statistics.
2. www.agronet.gov.co/agronetweb1/ridac/QuienesSomos/Objetivos.aspx (accessed 12 December 2013).
3. Created by MADR, Universidad Nacional, Corpoica, FEDEPALMA, Cenicaña, UNIMINUTO, Universidad de Ciencias Aplicadas y Ambientales – Udca y AUGURA, with the technical co-operation of FAO and the Colombian Office of IICA.
4. The network includes the following institutions (2010): Ceniacua, Cenibanano, Cenicafé, Cenicaña, Ceniflores, Conif, Cenipalma, Corporación Colombia Internacional, Corpoica, Corporación Biotec, Universidad Nacional de Colombia, Universidad de Ciencias Aplicadas y Ambientales – Udca, Universidad del Tolima, Universidad Tecnológica de Pereira, Universidad Jorge Tadeo Lozano, Universidad Pedagógica y Tecnológica de Colombia, Universidad de Caldas, Universidad del Quindío and the Ciat.

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PART III

Chapter 9

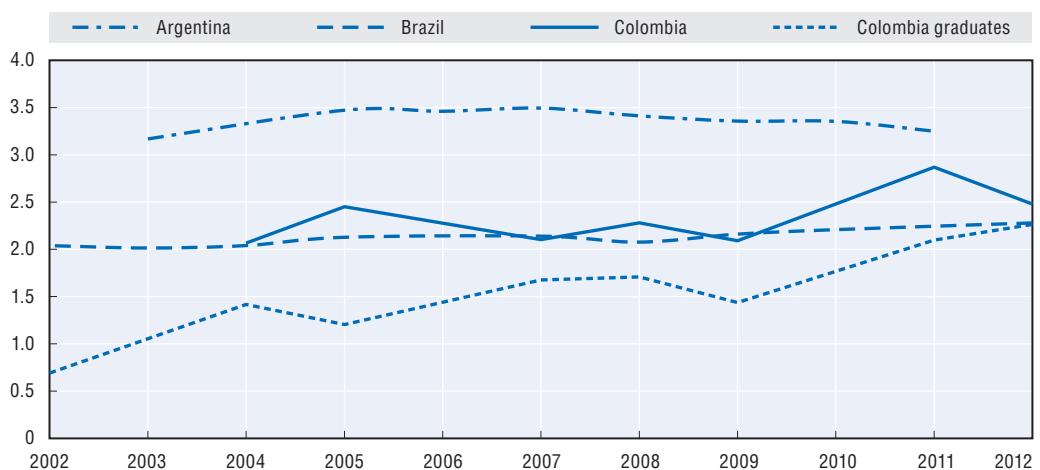
The adoption of innovation

This chapter looks at the capacity and incentives for the adoption of innovation and highlights key challenges. It starts by providing an assessment of technical assistance services. Training and technical assistance are critical to facilitate farmers' access to technology and knowledge and contribute to facilitate farmers' effective participation in innovation networks and ability to formulate their specific demands. In Colombia, technical assistance services are fragmented and lack of a comprehensive framework that could ensure co-ordination of efforts, improve participation and exchanges of information. The chapter then considers the key issues relating to the level of education in the agricultural sector. As in many countries, agriculture-related sciences fail to attract students and enrolments are not commensurate with the importance of the sector for the economy. This does not seem to be linked to inadequate supply of courses and scholarships, but to the lower salaries below PhD level, and the insecurity experienced in rural areas.

Agricultural education

There is no information on the participation of students in agricultural programmes at the secondary level, but evidence on participation at the tertiary level indicates a low participation rate, which is not consistent with the importance of the agricultural sector for the GDP and the huge technological gaps in Colombia. In the 2000s, the share of students enrolled in agricultural programmes at tertiary level has fluctuated between 2% and 2.5% of all students in tertiary education, a level similar to that in Brazil but lower than in Argentina. This share has then increased to 2.9% in 2011 to go back to 2.5% in 2012. Since 2004, the percentage of graduates in agriculture programmes at the tertiary level, very low at the beginning of the 2000s with a success rate of about two-thirds, increased faster than the percentage of enrolment (Figure 9.1).

Figure 9.1. Participation in agriculture programmes at tertiary level, 2002-12
Students enrolled at tertiary level in agricultural programmes as a percentage of all tertiary level student



Source: UNESCO UIS Statistics (2014), *Education and Literacy*, <http://data UIS.unesco.org/>.

StatLink <http://dx.doi.org/10.1787/888933182227>

More detailed data on enrolment from the Colombian Ministry of Education for 2011 and 2012 indicate that there is low demand and negative growth in areas relating to the agricultural sector, such as agronomy and veterinary services (Table 9.1).

Studies in agronomy, veterinary and related studies were the least sought after for MScs abroad and one of the lowest in terms of PhDs undertaken outside the country. Only fine art studies had lower numbers.

For Master's degrees taken in Colombia, the agricultural sector had the lowest numbers of all, except again for fine arts. For PhDs granted in the country, the numbers for the agricultural sector are higher than for economy, administration and accounting and health sciences, and once again fine arts (Table 9.2).

Table 9.1. Students enrolled in university courses, by field of knowledge, 2011-12

	2011	2012		Growth rate
	Number	Number	% of total	%
Economy, administration, accounting and related	93 260	100 867	32.8	8.2
Engineering, architecture, urban planning and related	65 676	66 539	21.6	1.3
Social and human sciences	49 094	52 845	17.2	7.6
Education sciences	38 040	40 140	13.0	5.5
Health sciences	23 437	24 271	7.9	3.6
Fine arts	9 722	10 671	3.5	9.8
Agronomy, veterinary and related	7 764	7 688	2.5	-1.0
Maths and natural sciences	4 686	4 855	1.6	3.6
Total	291 679	307 876	100.0	5.6

Source: MEN (2011), *Observatorio Laboral para la Educación, Encuesta de Seguimiento a Graduados*.

Table 9.2. Number of Master's degrees and PhDs by areas of specialisation, 2012

	Master's degree		PhD	
	In Colombia	Out of Colombia	In Colombia	Out of Colombia
Fine arts	66	40	1	7
Agronomy, veterinary and related	128	24	22	13
Economy, administration, accounting and related	1 615	228	8	17
Health sciences	428	46	13	21
Education sciences	1 255	160	48	73
Social and human sciences	1 652	237	65	79
Maths and natural sciences	562	93	74	76
Engineering, architecture, urbanism and related	1 302	209	79	81
Total	7 008	1 037	310	367
Agronomy, veterinary and related in % of total	1.8%	2.3%	7.0%	3.5%

Source: MEN (2011), *Observatorio Laboral para la Educación, Encuesta de Seguimiento a Graduados*.

In fact, the studies in agronomy, veterinary and related studies are not attracting students in Colombian universities. These fields of specialised knowledge were the only ones showing a contraction in 2012 (versus 2011) in the number of students enrolled, with a reduction rate of 1.0%. In total, Masters and PhD graduates in agronomy, veterinary and related studies account for 2.1% of total graduates.

The rate of graduation in the faculties of agronomy and animal science are the lowest among higher education institutions (23.4%) (SPADIES, 2011) and graduates are the ones taking the longest to find work (18.5% of those recently graduated take more than 12 months to find a job versus the general average of 8.9%) (MEN, 2011).

This low participation rate does not appear to be the result of shortages in the number of education or job opportunities. In this respect, the following should be noted:

- The national programmes for Master's degrees in these subjects have increased from four in 2002 to 19 in 2011.
- The national programmes for PhDs have increased from zero in 2002 to ten in 2011.
- The number of scholarships, credit and credit-scholarships for Master's degrees has increased from an average of three in 2002-03 to 25 in 2010-11.
- The number of scholarships, credit and credit-scholarships for PhDs has increased from five in 2002 and eight in 2003 to 19 in 2010 and 56 in 2011.
- Active research groups increased from 165 in 2002 to 257 in 2011 (OCyT, 2012).

A first approach to the reasons for the low number of degrees points to the greater difficulty to find work and the lower average salaries versus the national averages for higher education. Employment of recent graduates in the formal economy and the initial salaries recorded for 2012 in the case of graduates from programmes connected with the agricultural sector are below the national average at all levels except for PhDs (Table 9.3).

Table 9.3. Employment of recent graduates and average salary in the agro-industrial sector, 2012

Level of education	Agro-industrial		National average	
	Monthly salary	Employed	Monthly salary	Employed
Unit	COP	% of total employees	COP	% of total employees
Professional technician	798 313	34.8	1 003 609	64.4
Technician on adaptation	919 174	42.6	1 069 599	67.9
University graduate	1 293 130	71.4	1 604 583	78.8
Specialist	2 060 648	82.2	2 724 971	92.4
Master's degree	2 846 149	88.8	3 659 083	92.7
PhD	5 540 614	94.0	5 470 376	92.9
Average	1 205 483	57.4	1 814 350	78.7

Source: MEN (2011), *Observatorio Laboral para la Educación, Encuesta de Seguimiento a Graduados*.

Employment and salary data for PhDs in agricultural sciences are similar to the national average, but the number of PhD degrees granted in agricultural sciences is not high. A possible explanation for this, although one not supported by documentary evidence, is the lack of security in Colombia in recent decades, which has had its greatest impact in the rural sector, affecting both the demand and supply of job opportunities.

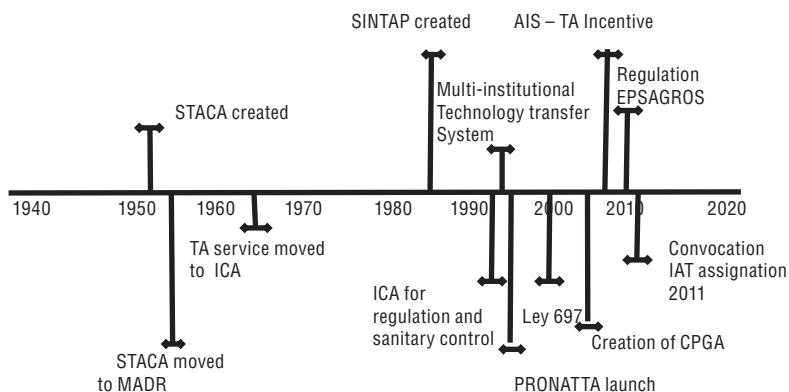
In 2013, the Ministry of Agriculture and Icetex¹ designed a programme to stimulate youngsters from the least well-off socio-economic strata and whose families did not reside in any of the 14 largest cities in the country to enrol in agricultural science programmes in their first academic semester. MADR finances half of the tuition with grants, while Icetex finances the other half with loans.

Technical assistance

The extension services, today referred to as technical assistance, are the Achilles heel of the Colombian agricultural innovation system. As shown in Figure 9.2, many changes were introduced in the Agricultural Technical Assistance Subsystem (SSAT) over time, for two reasons: 1) the system itself did not achieve its objectives; and 2) there were different conceptions of what extension meant.

Initially, there was the belief that technology was universal, and that a technological advance should work out just as well in any part of the world. Innovation was understood to be a chain of links in a straight line, in which technologies being developed would simply go from researchers to producers through extension workers and could be utilised without any problems by the agricultural producers.

This approach has been changing in Colombia due to a paradigm shift regarding technical assistance (Table 9.4). It moved away from the idea of a linear structure that had prevailed since the mid-20th century, to adopt a much more complex, reality-reflecting paradigm that recognises that innovations are successfully disseminated as an outcome of training and co-operation in a context of sustainable agricultural production.

Figure 9.2. Main developments of extension in Colombia

Note: TA: Technical Assistance. See list of acronyms.

Source: Perry (2012), *El Sistema de Extensión Agropecuaria en Colombia*.

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Table 9.4. Names, paradigms, referents and approaches to rural extension

Stage	Name evolution	Emerging paradigms	Referent authors	Coexisting approaches
1945-60	Agricultural extension	Dissemination of innovation	E. Rogers	Dissemination of innovation
1960-90	Transfer of technology and rural extension	Dissemination of innovation. Green revolution.	E. Rogers N. Bourlg	Increase in crop production. Technological package transfers
1960-80	Rural communication	Educational	P. Freire	Structure change
1990	Rural extension and technology transfer, sustainable technical assistance	Educational and constructivist. Dissemination of innovation	Rogers Freire Roling Brundtland	Productive and sustainable intensification, productive system focus
2005	Rural extension and technology transfer, sustainable technical assistance	Educational, constructivist. Dissemination of innovation as a result of learning and co-operation, agro-ecological	Rogers Freire Roling Brundtland Altieri	Productive and sustainable intensification, productive systems and agroecology

Source: Thornton (2006), *Los 90's y el nuevo siglo en los sistemas de Extensión Rural y Transferencia de Tecnología públicos en el MERCOSUR*; Clavijo-Ponce (2008), *Transferencia de Tecnología, Soberanía y Seguridad Alimentaria*; Clavijo-Ponce (2012), *Antecedentes y Nuevas Perspectivas de la Asistencia Técnica en Colombia*.

As a result of the weakness in technical assistance in the 1950s and 1960s, those private producers with a degree of organisation began establishing CENIs and requested government regulations to establish mandatory fees to create the parafiscal funds that finance such centres, and outsource technological research projects, or the provision of technical assistance. As a result, rural extension included two parts:

- “One part, exercised by the corporate bodies of successful companies and products (mainly but not exclusively linked to exportation), assumes the role of agent of technical change in rural extension in an aggressive and committed way, creating their own technical teams linked to research and development processes” (Clavijo-Ponce, 2012).
- Rural extension as practiced by the Ministry of Agriculture, the land access bodies and others charged with promoting technological change out of sync with the conditions needed to take the innovations to a customer base that was, in any case, unable to adopt the changes (González, 2000).

Toward the end of the 1980s, the decentralisation of technical assistance began with the creation of the Municipal Units for Agricultural Technical Assistance (UMATAs). The National System for the Transfer of Agricultural Technology (SINTAP) was created to co-ordinate technical assistance at the national, departmental and municipal levels.

In the 2000s, a process of technical assistance regionalisation was introduced, and SINTAP was replaced by the National Programme for the Transfer of Technology (PRONATTA), which privileges the associative work in municipalities. Provincial centres for agricultural management (CPGAs), as well as the private company Epsagros, were created as sub-regional municipal institutions to offer technical assistance. In addition, CPGAs prepared the General Plans for Rural Technical Assistance (rural PGATs), approving the corresponding programmes and projects, and signing contracts with Epsagros for the direct supply of technical assistance, the idea being to replace the UMATAs, which suffered from a lack of financing and political problems. The expected replacement did not take place and both institutions – Epsagros and UMATAs – continued to work side-by-side.

In 2007, the Agricultural Income Security (AIS) programme, in which the government granted resources directly to the producer to procure his own technical assistance, was introduced in an attempt to privatise the system. The AIS was then restructured as the Equitable Rural Development (DRE) programme with a more integrated conception of the technical assistance processes. As a result, by 2012 there were three co-existing models for technical assistance financed with public resources:

- Technical assistance provided by the UMATAs and CPGAs-Epsagros
- Technical assistance provided by producer associations, mainly with resources from parafiscal funds
- Technical assistance on demand, co-financed by MADR programmes such as DRE, Producer Alliances (*Alianzas Productivas*) and Rural Opportunities (*Oportunidades Rurales*), which have a technical assistance component (Clavijo-Ponce, 2012).

Municipalities are currently in charge of providing technical assistance for small- and medium-sized farms. They develop programmes (PGATs) to receive federal funding and hire a provider among those mentioned above to implement these programmes. The law states that technical assistance for small- and medium-sized farms is the responsibility of state and local governments.

The central government subsidises access to private extension services through, for example, the Economic Incentive to Direct Rural Technical Assistance (IEATDR). This incentive is given to municipalities or to CPGAs for an amount equivalent to 80% of the total assigned to each producer, the remaining portion being contributed by the municipality itself. The total amount that can be received by each municipality is determined by the number of producers enrolled in the Single Record of Direct Rural Technical Assistance Users (*Registro Único de Usuarios de Asistencia Técnica Directa Rural*) and by the cost of execution of the PGAT. The subsidy rate is uniform per producer but variable per municipality. The group of municipalities may pay a larger counterpart, but the contribution of the central government is the same in absolute terms per agricultural producer.

The subsidy covers agricultural producers, cattle breeders, the forestry, aquaculture or fishery sectors, as well as soil studies, development activities, application and use of appropriate technologies, management of credit access, product marketing, and promotion of producer organisation models.

The Equitable Rural Development (DRE) programme provides technical assistance support to small farmers, as part of investment support (see Chapter 5 for more information).

ICT tools are being developed to facilitate access to knowledge: one example is the “consult with an expert” Internet site to which questions can be sent, and Linkata, a tool to share experiences, and mobile devices to send alerts concerning pest and diseases.

Strength and weaknesses of the technical assistance offered

The current technical assistance system is unstable, relatively costly, and disconnected from R&D and education. It also focuses on technical aspects with little consideration for the economic environment, including access to credit, marketing, environmental services, business management, and broader rural development. Technical assistants lack the required skills and would need re-training. Other weaknesses include:

- The policy for rural development has not had an appropriate territorial focus despite the regulatory and institutional changes introduced.
- Technical assistance has had a top down approach in which the researcher defines his/her own priorities and delivers outcomes that are placed at the disposal of the technical assistants.
- There has been no comprehensive approach that includes associations and local organisations for rural development.
- Technical assistance has concentrated on technical innovations created by specialised research centres, and has neglected innovations in terms of new products, new processes, new forms of organisation, and new markets.
- The actions and projects contained in the technical assistance plans are not necessarily linked and co-ordinated as a coherent whole.
- The needed networks for the interchange and circulation of information on “policies for rural development and transfer and dissemination of innovation” either do not exist or are not created or supported.
- The local organisations for rural development do not have an adequate proportion of the responsibility for decision making in financing and innovation management. (Clavijo-Ponce, 2012)

A 2013 Inter-American Development Bank report points to the following weaknesses:

- Financing very concentrated on public resources.
- Absence of monitoring and control mechanisms of the PGATs (although this is in the process of changing, in accordance with the Siembra platform, since there already exists an *ex ante* evaluation, which is the methodological foundation and the basis of information for the *ex post* evaluation).
- Lack of suitable accreditation regarding technical assistants and their training.
- Low co-ordination levels between research and technical assistance, as well as between research and commercial application.
- Very low participation of producers and few plans for the provision of technical assistance services.
- Poor linkage between technical assistants with research centres, universities and government agencies at the local level.
- Erroneous approaches to technical assistance and low availability of basic infrastructure to provide technical assistance services. (Tami-Barrera et al., 2013)

On the other hand, the Colombian SSAT benefits from the redesigning of public policy on technical assistance in the direction promoted by national and international experts, including the definition of research agendas by supply chain and the preparation of General Plans for Municipal Technical Assistance (PGATs). Still missing are evaluations of the social and economic impact of technical assistance provided and feedback to decision-makers on specific topics.

Agricultural policy support to adoption of innovation

Agricultural policies affect farm investments and practices through a variety of instruments, with different impacts on structural change, sustainability and innovation. Measures that distort input and output markets, such as border protection, supply controls, output-based payments and variable input subsidies, reduce producers' incentives to use production factors more productively. As such, they hinder structural adjustment and discourage producers to innovate to become more competitive. These distorting measures can maintain resources in the sector that would otherwise be reallocated to more productive uses; they can encourage more intensive production, sometimes on marginal or fragile land; and they can encourage production practices that do not always take adequate consideration of longer term environmental sustainability.

Agricultural measures that support innovation directly are likely to create stronger incentives and capacity for innovation among agricultural producers and will help structural change. Similarly, agri-environmental payments that target explicitly the desired environmental outcome would steer farmers towards innovative sustainable practices more effectively.

Colombian agricultural policies are reviewed in Chapter 5. In addition to technical assistance and education grants mentioned above, the MADR provides specific support for the adoption of innovation in small-scale agriculture. This includes subsidies to farmers to invest in innovation at all stages of the production process until the final marketing as a way to help resolve the difficulties of the rural populations. MADR also helps peasant population organisation express its needs for innovation, and at the same time promotes the inclusion of rural young people in business or educational opportunities.

In addition, the MADR can lend support, including technical assistance, to large and medium-sized farms to enable farmers to face international competition.

Summary

- Agriculture-related sciences fail to attract students and enrolment is not commensurate with the importance of the sector for the economy. This does not seem to be linked to an inadequate supply of courses and scholarships, but rather to salaries that are too low, except at PhD level, and the insecurity experienced in rural areas. This failure to raise the level of education could have serious long-term implications for the agricultural innovation system.
- Technical assistance is available for free to small- and medium-sized farms. It is under the responsibility of municipalities, who choose among different providers and receive federal support on the basis of PGATs. Services are fragmented at the local level and depend on which programmes are implemented and the diversity of providers that are called upon. There is no comprehensive framework that could ensure co-ordination of

efforts across municipalities, and improve participation and the exchange of information, while also addressing territorial issues.

- Technical assistance services are disconnected from R&D and education, and are not part of an agricultural innovation system. Technical assistance mainly focuses on technical issues and lacks an integrated approach that takes into consideration the technical, economic and environmental aspects of farm management.
- The focus on supply chain excludes the development of new products and markets, the tackling of horizontal issues – such as water management, business management, or organisation innovation – and consideration of the broader rural development context.
- The development of a general plan for rural technical assistance (PGAT) should improve the co-ordination of technical assistance services across regions. The Siembra network will also provide a platform for exchanging information on experiences and producer needs which should benefit technical assistants and producers.
- Investment support facilitates the adoption of innovation. Some programmes are targeted to small-scale farms and include a technical assistance component.

Note

1. Colombian public authority dedicated to the financing of studies abroad.

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