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**Characterization of the global value chains of organic products in Rio de Janeiro,  
Brazil: case study in Cachoeiras de Macacú and Nova Friburgo**

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## Acronyms and Abbreviations

AAO	Associação de Agricultura Orgânica de São Paulo / Organic Agriculture Association of São Paulo
ABIO	Associação de Agricultores Biológicos do Estado do Rio de Janeiro / Biological Farmers Association of the State of Rio de Janeiro
ANC	Associação de Agricultura Natural de Campinhas e Região / Natural Farming Association of the State of Campinhas and Region
APEX	Agência Brasileira de Promoção de Exportações e Investimentos / Brazilian Trade and Investment Promotion Agency
APTA	Associação de Programas em Tecnologias Alternativas com atuação no Espírito Santo / Association of Alternative Technology Programs operating in Espírito Santo
BCS	BCS Öko-Garantie Gesellschaft mit beschränkter Haftung / German Company of organic certification
BLUMEN	Biodiversity in Integrated Land Use Management for Economic and Natural System Stability in the Mata Atlântica of Rio de Janeiro
CCFO	Circuito Carioca de Feiras Orgânicas / Carioca Circuit of Organic Farmers Markets
CIOrg	Centro de Inteligência em Orgânicos / Intelligence Center in Organics
CM	Cachoeiras de Macacu
CNPOrg	Comissão Nacional de Produção Orgânica / National Commission for Organic Production
CEASA	Central de Abastecimento / Center of Sales and Distribution
COAGRE	Coordenação de Agroecologia do MAPA / Agroecology Coordination of MAPA
COMPERJ	Complexo Petroquímico do Rio de Janeiro / Petrochemical Complex of Rio de Janeiro
COOLMEIA	Cooperativa Ecológica COOLMÉIA / Ecological Cooperative COOLMÉIA
COONATURA	Associação Harmonia Ambiental Coonatura (RJ) / Harmony Environmental Association Coonatura (RJ)
CPOrg-RJ	Comissão de Produção Orgânica no Rio de Janeiro / Organic Production Committee in Rio de Janeiro
CPOrg-UF	Comissão de Produção Orgânica nas Unidades da Federação / Organic Production Committee in the Federation Units
CSAO	Câmara Setorial da Agricultura Orgânica / Sectorial Chamber of Organic Agriculture
DAP <sup>1</sup>	Declaração de Aptidão ao PRONAF / Declaration of Aptness for PRONAF
DINARIO	Climate Change, Landscape Dynamics, Land Use and Natural Resources in the Atlantic Forest of Rio de Janeiro
ECOCERT	Inspection and Certification Body for Sustainable Development
EMATER-CM	Empresa de Assistência Técnica e Extensão Rural em Cachoeiras de Macacu / Corporation for Technical Assistance and Rural Extension in Cachoeiras de Macacu
EMATER-NF	Empresa de Assistência Técnica e Extensão Rural em Nova Friburgo / Corporation for Technical Assistance and Rural Extension in Nova Friburgo

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<sup>1</sup> Detailed information may be found at: <http://comunidades.mda.gov.br/portal/saf/institucional/aeclaracaoaptidaopronaf>

EMATER-RJ	Empresa de Assistência Técnica e Extensão Rural do Rio de Janeiro / Corporation for Technical Assistance and Rural Extension of the State of Rio de Janeiro
EMBRAPA	Empresa Brasileira de Pesquisa Agropecuária / Brazilian Agricultural Research Corporation
EMBRAPA Agrobiologia	Centro Nacional de Pesquisa em Agrobiologia / Embrapa Agrobiology - National Center of Agrobiology Research
FAPERJ	Fundação Carlos Chagas Filho de Amparo à Pesquisa do Estado do Rio de Janeiro / Carlos Chagas Filho Foundation for Research Support of the State of Rio de Janeiro
GAO	Grupo de Agricultura Orgânica / Group of Organic Agriculture
IAPAR	Instituto Agrônomo do Paraná / Agronomic Institute of Paraná
IBD <sup>2</sup>	Associação de Certificação Instituto Biodinâmico (IBD) / Brazilian Agricultural and Food Inspections and Certifications
IDEC	Instituto Brasileiro de Defesa do Consumidor / Brazilian Institute of Customer Protection
IFOAM	International Federation of Organic Agriculture Movements
IMO	Institute for Marketecology / Institut für Marktökologie
INMETRO	Instituto Nacional de Metrologia, Qualidade e Tecnologia / National Institute of Metrology, Quality and Technology
INT	Instituto Nacional de Tecnologia / National Institute of Technology
ISO 65	International Organization for Standardization: Guide 65 for Bodies Operating Product Certification Systems
MAPA	Ministério da Agricultura, Pecuária e Abastecimento / Ministry of Agriculture, Livestock and Supply
MDA	Ministério do Desenvolvimento Agrário / Ministry of Agricultural Development
MIDC	Ministério do Desenvolvimento, Indústria e Comércio Exterior / Ministry of Industry, Development and International Affairs
NF	Nova Friburgo
NGI	Non-Governmental Institution (represented by Participatory Conformity Assessment Bodies and Private Industries of Processing and Distribution)
NGO	Non-Governmental Organization
OCS	Organização de Controle Social para Venda Direta/ Social Control Organization for Direct Sales
OAC <sup>3</sup>	Organismo de Avaliação da Conformidade para Certificação por Auditoria / Conformity Assessment Organism - Certification by Audit
OECD	Organização para a Cooperação e Desenvolvimento Econômico / Organization for Economic Co-operation and Development
OPAC <sup>3</sup>	Organismo Participativo de Avaliação da Conformidade / Participatory Conformity Assessment Body
PAA <sup>4</sup>	Programa de Aquisição de Alimentos / Food Purchase Program

<sup>2</sup> Evolution of IBD may be found at: <http://www.biodinamica.org.br/apresentacao.htm>

<sup>3</sup> Detailed information may be found at: Detailed information may be found at: the Decree Nº 6.323 of 27th December, 2007. Chapter III, Section I, Article 29, Second paragraph which calls by legal denomination: Participative Organic Quality Assurance System to what is called OPAC in this research and Certification by Audit to what is called OAC in this research: [http://www.prefiraorganicos.com.br/media/45812/decreto\\_6.323\\_ingles.pdf](http://www.prefiraorganicos.com.br/media/45812/decreto_6.323_ingles.pdf)

<sup>4</sup> Detailed information may be found at: <http://www.mds.gov.br/segurancaalimentar/alimentoseabastecimento/paa>

PAIS	Produção Agroecológica Integrada e Sustentável / Sustainable and Integrated Agroecological Production
PAC	Programa de Aceleração do Crescimento / Growth Acceleration Program
PESAGRO	Empresa de Pesquisa Agropecuária do Estado do Rio de Janeiro / Agricultural Research Corporation of the State of Rio de Janeiro
PNATER	Política Nacional de Assistência Técnica e Extensão Rural / National Policy of Technical Assistance and Rural Extension
PNAE <sup>5</sup>	Programa Nacional de Alimentação Escolar / National School Feeding Program
PPP	Institutions of Public Private Partnership
PRONAF <sup>6</sup>	Programa Nacional de Fortalecimento da Agricultura Familiar / National Program of Family Agriculture Strengthening
Pro-Orgânico	Programa de Desenvolvimento da Agricultura Orgânica / Programme for the Development of Organic Agriculture
PSS	Permanent Stores and Supermarkets
REBRAC	Rede Brasileira de Avaliação da Conformidade / Brazilian Network for Conformity Assessment
SBCO	Brazilian Organic Conformity Assessment
SDC/MAPA	Secretaria de Desenvolvimento Agropecuário e Cooperativismo / Secretariat for Agricultural Development and Cooperativism
SEBRAE-NF	Serviço Brasileiro de Apoio às Micro e Pequenas Empresas de Nova Friburgo / Brazilian Service of Assistance to Micro and Small Enterprises of Nova Friburgo
SEBRAE-RJ	Serviço Brasileiro de Apoio às Micro e Pequenas Empresas do Estado do Rio de Janeiro / Brazilian Service of Assistance to Micro and Small Enterprises of Rio de Janeiro
SEDES	Secretaria Especial de Desenvolvimento Econômico Solidário da Prefeitura do Rio de Janeiro / Special Secretariat of Solidary Economic Development of the Rio de Janeiro Prefecture
SFA	Superintendência Federal de Agricultura / Federal Superintendence of Agriculture
SisOrg	Sistema Brasileiro de Avaliação da Conformidade Orgânica / Brazilian Organic Conformity Assessment System
SNA	Sociedade Nacional de Agricultura / National Agricultural Society
SPG <sup>7</sup>	Sistema Participativo de Garantia / Participatory Guarantee System
UFRJ	Universidade Federal do Rio de Janeiro / Federal University of Rio de Janeiro
UFRRJ	Universidade Federal Rural do Rio de Janeiro / Federal Rural University of Rio de Janeiro

<sup>5</sup> Detailed information may be found at: [http://gestao2010.mec.gov.br/o\\_que\\_foi\\_feito/program\\_60.php](http://gestao2010.mec.gov.br/o_que_foi_feito/program_60.php)

<sup>6</sup> Detailed information may be found at: <http://www.mda.gov.br/portal/saf/programas/pronaf>

<sup>7</sup> Participative Organic Quality Assurance Systems, by legal denomination:  
[http://www.prefiraorganicos.com.br/media/45812/decreto\\_6.323\\_ingles.pdf](http://www.prefiraorganicos.com.br/media/45812/decreto_6.323_ingles.pdf)

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## **Abstract**

The scientific project on Climate Change, Landscape Dynamics, Land Use and Natural Resources in the Atlantic Forest of Rio de Janeiro (DINARIO) incorporates as part of its Module IV of participative research in rural development, the economic and ecological evaluation of land-use systems which promote sustainable practices. DINARIO is located in six municipalities from which two were recognized as the most diverse in terms of elevation and climatic conditions to identify the implementation of practices that foster sustainable land use alternatives. The system of study was the organic agriculture and the approach was through the identification of the organic value chains available for these municipalities.

This research took place in the Municipalities of Cachoeiras de Macacu (CM) and Nova Friburgo (NF) as study case to characterize their global value chains of organic products, aiming to: identify organic farmers and their available production quality; analyze advantages and disadvantages faced by stakeholders which are related to these value chains and assess the programs, projects and institutions working on organic agriculture on the municipalities under study. These objectives were addressed by a value chain analysis through semi structured interviews made on 76.8% of all stakeholders from both municipalities, which were divided for study purposes in six groups.

There were identified 14 organic farmers who commercialized their products through three main value chains, which named by the final market are: supermarkets and specialized stores, farmers markets, and home delivery baskets. Farmers from CM receive from 23% to 36% share of the final value of organic products while, farmers from NF receive from 54% up to 73% share of the final value depending on the chain used. Farmers markets showed the widest variety of products which went from 51 to 104 crops.

The weaknesses perceived by most stakeholders were lack of technical assistance, small production and instable volume of organic products. The major threats were characterized by high transportation costs and poor awareness of organic agriculture among potential consumers. The Carioca Circuit of Organic Farmers Markets was perceived as the most important strength for most stakeholders, and the organization of farmers as the most important opportunity for sales enhancement.

Public support towards organic agriculture is represented by food acquisition programs fostered by federal institutions and credit lines managed by local institutions. However, most the organic farmers of the municipalities under study cannot access those programs because the farmers do not depend on organic agriculture as strong part of their income.

In general terms, organic agriculture is developing in a healthy pace on these municipalities, in which the focus of value chains needs is moving from identification of commercialization niches to production planning of organic crops. The research found that despite the weaknesses and threats to overcome, the matrix of stakeholders have an important mixture of public and private entrepreneurs who are developing production planning strategies to foster a bigger and more diverse commercialization.

## Resumen

El proyecto de investigación científica sobre Cambio climático, Dinámicas de Paisaje, Uso de Suelo y Recursos Naturales en la Selva Atlántica de Río de Janeiro (DINARIO) incorpora como parte de su Módulo IV de Investigación participativa en desarrollo rural, la evaluación económica y ecológica de los sistemas de uso de suelo que promueven prácticas sustentables. DINARIO está localizado en seis municipios de los cuales dos fueron reconocidos como los más diversos en cuanto a elevación y clima para identificar la implementación de prácticas adecuadas que promueven alternativas sustentables de uso de suelo. El sistema de uso de suelo identificado fue el de agricultura orgánica y el enfoque utilizado fue a través de la identificación de cadenas de valor de productos orgánicos disponibles en estas municipalidades.

Esta investigación tomó a los Municipios de Cachoeiras de Macacu (CM) y Nova Friburgo (NF) como casos de estudio a fin de caracterizar las cadenas de valor globales correspondientes a su producción orgánica, con el propósito de: identificar agricultores orgánicos y la calidad de sus productos; analizar ventajas y desventajas enfrentadas por los involucrados en las cadenas de valor y evaluar las instituciones, programas y proyectos relacionados con agricultura orgánica presentes en los dos municipios. Estos objetivos se delinearon de acuerdo al análisis de cadena de valor por medio de entrevistas semi-estructuradas que cubrieron al 76.8% de los involucrados; los mismos que fueron divididos en seis grupos para facilitar su estudio.

Se identificaron 14 agricultores orgánicos que comercializan sus productos principalmente por tres cadenas de valor, que nombradas de acuerdo al mercado final son: supermercados y tiendas especializadas, mercados de productores y, cestas de entrega a domicilio. Los agricultores de CM reciben entre 23% y 36% del valor final de sus productos, mientras agricultores de NF entre 54% y 73% del mismo, dependiendo de la cadena utilizada. Los mercados de productores mostraron la mayor variabilidad de productos la cual va desde 51 hasta 104 tipos de cultivos.

Las debilidades percibidas por la mayoría de involucrados son: falta de asistencia técnica, pequeña producción y, la no continuidad en el volumen de productos; Las principales amenazas identificadas fueron los altos costos de transporte y el poco conocimiento de agricultura orgánica por parte de potenciales compradores. El Circuito Carioca de Ferias Orgánicas fue percibido como la mayor Fortaleza actual, mientras que la organización de agricultores para la venta de productos fue la oportunidad más importante. El apoyo gubernamental para la agricultura orgánica en Brasil está representado por programas de compra de alimentos que son promovidos por instituciones federales y líneas de crédito manejadas por instituciones locales. Sin embargo la mayoría de los agricultores orgánicos de las municipalidades bajo estudio no tienen acceso a estos programas ya que no dependen de la agricultura orgánica como fuente importante para sus ingresos.

En términos generales, la agricultura orgánica se desarrolla a un paso saludable en estas municipalidades, en las cuales el enfoque de necesidades de las cadenas de valor está cambiando de la identificación de nichos de comercialización hacia la planificación de la producción, se encontró que a pesar de las debilidades y amenazas por superar, la matriz de stakeholders tiene una importante mezcla de empresas públicas y privadas que están desarrollando estrategias de planeación de la producción a fin de implementar una más grande y diversa oferta de comercialización.

## Zusammenfassung

Das wissenschaftliche Projekt zum Klimawandel, zur Dynamik der Landschaft, der Nutzung des Landes und natürlicher Ressourcen im atlantischen Wald von Rio de Janeiro (DINARIO) enthält als einen Teil seines Moduls IV der Teilnehmerforschung in ländlicher Entwicklung, der ökonomischen und ökologischen Bewertung des Land-Nutzungs-Systems mit Förderung der nachhaltigen Praktiken. DINARIO befindet sich in sechs Gemeindeverbänden. Zwei von ihnen sind die unterschiedlichsten in Elevation und klimatischen Bedingungen für die Identifizierung der Implementierung von Praktiken, die Alternativen zur nachhaltige Landnutzung fördern. Das Studiensystem war die biologische Landwirtschaft und die Annäherung war durch die Identifikation der biologischen Wertschöpfungskette erreichbar in allen besagten Gemeindeverbänden.

Diese Untersuchung fand in den Gemeindeverbänden von Cachoeiras de Macau (CM) und Nova Friburgo (NF) statt als ein Fallbeispiel zur Charakterisierung der globalen Wertschöpfungskette der biologischen Produkte, die auf folgendes abzielen: Identifizierung biologischer Bauern und ihrer zur Verfügung stehenden Produktqualität; Analyse der Vor- und Nachteile, denen sich die Anspruchsgruppen gegenüber sehen, die der Wertschöpfungskette verbunden sind und die die Programme, Projekte und Institutionen bewerten, die an biologischer Landwirtschaft und den Gemeindeverbänden der Studie arbeiten. Diese Grundsätze entstammen einer Analyse der Wertschöpfungskette, durch zur Hälfte strukturierte Interviews, die an 76,8 % der Interessensgruppe von beiden Gemeindeverbänden durchgeführt wurden, die zu Studienzwecken in sechs Gruppen unterteilt wurden.

Es wurden 14 biologische Landwirte identifiziert, die ihre Produkte durch drei zentrale Wertschöpfungsketten vermarkteten. Nach dem letzten Markt benannt wäre dies: Supermärkte und spezielle Läden, Landwirtschaftliche Märkte und Körbe für Hausverkäufe. Landwirte aus CM erhalten zwischen 23% und 36% der letzten Wertschöpfung der biologischen Produkte während Landwirte aus NF zwischen 54% und 73% der letzten Wertschöpfung, abhängig von der angewandten Wertschöpfungskette, erhalten. Landwirtschaftliche Märkte zeigen die größte Variation von Produkten, von 51 bis 104 Saaten.

Schwächen, die die meisten Interessensgruppen erhalten sind technische Assistenz, kleine Produktion und instabiles Volumen der biologischen Produkte. Die großen Gefährdungen sind charakterisiert durch hohe Transportkosten und wenig Aufmerksamkeit für biologische Landwirtschaft durch die potentiellen Kunden. Die Carioca Circuit der biologischen landwirtschaftlichen Märkte wird wahrgenommen als die wichtigste Stärke für die meisten Interessensgruppen und die Organisation der Farmer als die wichtigste Möglichkeit für die Erhöhung der Verkäufe.

Öffentliche Unterstützung für die biologische Landwirtschaft wird vertreten durch Nahrungsmittel Abnahme Programme gefördert von förderalen Institutionen und Dispositionskrediten gemanaget von lokalen Institutionen wie EMATER und Gemeindeverbänden. Nichts desto Trotz können die meisten biologischen Landwirte dieser Gemeindeverbände aus der Studie nicht an diesen Programmen teilnehmen, weil sie nicht abhängig von biologischer Landwirtschaft, als stärkster Teil ihres Einkommens, sind.

Zusammenfassen kann man sagen, dass biologische Landwirtschaft sich in einer gesunden Art entwickelt in diesen Gemeindeverbänden, in denen der Fokus der Wertschöpfungskettenbedürfnisse sich bewegt, von Identifikation der kommerziellen Nischen zu Produktionsplanung von biologischen Saaten. Die Nachforschungen fanden heraus, das neben der Schwäche und überwundenen Bedrohungen, die Matrix der Interessensvertreter einen wichtigen Mix von öffentlichen und Privaten Unternehmern haben, die Produktplanungsstrategien entwickeln, um größere und diverserer Kommerzialisierung zu entwickeln.

## Resumo

O projeto científico sobre “Mudanças climáticas, dinâmica da paisagem, uso da terra e recursos naturais na Mata Atlântica do Rio de Janeiro” (DINARIO) incorpora como parte de seu IV Módulo de pesquisa participativa para o desenvolvimento rural, a avaliação econômica e ecológica dos sistemas de uso da terra que promovem práticas sustentáveis. DINARIO está localizado em seis municípios dos quais dois foram reconhecidos como os mais diversificados em termos de altitude e condições climáticas para identificar a implementação de práticas que promovam alternativas de uso sustentável da terra. O sistema de estudo foi a agricultura orgânica e a abordagem foi através da identificação das cadeias de valor orgânicas disponíveis nesses municípios.

Esta pesquisa foi realizada nos municípios de Cachoeiras de Macacu (CM) e Nova Friburgo (NF) como estudos de caso para caracterizar as suas cadeias de valor global de produtos orgânicos, com o objetivo de: identificar os agricultores orgânicos e a qualidade disponível de sua produção; analisar vantagens e desvantagens enfrentadas pelos segmentos envolvidos com essas cadeias de valor; e avaliar os programas, projetos e instituições que trabalham na agricultura orgânica nos municípios em estudo. Estes objetivos foram abordados por uma análise da cadeia de valor através de entrevistas semiestruturadas realizadas em 76,8 % de todos os segmentos envolvidos de ambos os municípios, os quais foram divididos para fins de estudo em seis grupos.

Foram identificados 14 produtores orgânicos que comercializavam seus produtos através de três cadeias de valor principais, que foram nomeadas conforme o mercado final, sendo: supermercados e lojas especializadas, feiras de agricultores e cestas de entrega em domicílio. Agricultores de CM receberam de 23 % a 36 % do valor final dos produtos orgânicos, enquanto que os agricultores de NF receberam de 54% a 73 % do valor final dependendo da cadeia usada. As feiras de agricultores mostraram a maior variedade de produtos que foi de 51 a 104 culturas.

As fragilidades percebidas pela maioria dos envolvidos foram falta de assistência técnica, pouca produção e volume instável de produtos orgânicos. As principais ameaças foram caracterizadas por custos de transporte elevados e pouca sensibilização da agricultura orgânica entre os consumidores potenciais. O Circuito Carioca de Feiras de Agricultores Orgânicos foi visto como a fortaleza mais importante para a maioria dos segmentos envolvidos, e a organização dos agricultores como a oportunidade mais importante para a melhoria de vendas.

O apoio público para a agricultura orgânica é representado por programas de aquisição de alimentos promovidos pelas instituições federais e linhas de crédito administradas por instituições locais. No entanto, a maioria dos agricultores orgânicos dos municípios em estudo não podem acessar esses programas, porque os agricultores não dependem da agricultura orgânica como fonte principal de sua renda.

Em termos gerais, a agricultura orgânica está se desenvolvendo em um ritmo saudável nesses municípios, em que o foco das necessidades das cadeias de valor está se movendo da identificação de nichos de comercialização para o planejamento da produção de culturas orgânicas. A pesquisa observou que apesar das fraquezas e ameaças a serem superadas, a matriz dos segmentos envolvidos têm uma importante combinação de empreendimentos públicos e privados que estão desenvolvendo estratégias de planejamento de produção para promover uma maior comercialização e mais diversa.



## I. Introduction

Initiatives for the development in Brazil of an ecologically based farming movement started in the 1970's -We must understand that as an ecologically based agriculture, we are considering many agricultural methods, including organic, transitional and sustainable; Brazil's ecologically based farming movement is a result of generalized criticism of a model based on monoculture and agrotoxics- It was generically known at first as alternative agriculture. It had its historic roots based on social movements which generally arrived Germany, Swiss and Austria. The ecologically based agricultural systems were also motivated by political organizations which were seeking a new structure for society, a model based on claims for equity and social justice. The debate was intensified since "Silent Spring", a book written by Rachel Carson in 1962 (GTZ, 2007). In 2003 the Brazilian Government published the Law of Organic Production (*Lei da Produção Orgânica* No 10.831) which stated: "Every product called ecological, biodynamic, natural, regenerative, biological, agroecological, permanent culture and others are considered by Organic Law as Organic Product. Since January 2011 all "non-conventional" production systems have being supervised by Organic Legislation for receiving the new seal of the SBCO - Brazilian Organic Conformity Assessment" (Soares, Salman, Aroeira, Fonseca, Silva, & Fagundes, 2012, p. 7). This law compiles information from all organic farmers and entities that are currently working in Brazil, and expects to harmonize data and methodological procedures in organic agriculture.

"Organic agricultural production in Rio de Janeiro has a trajectory of around 30 years, starting in 1979 with the creation of COONATURA. Later; by 1984 ABIO was created with the main objective of facilitating commercialization of natural products in the region" (Posdena, Jansens, & Torrico, 2009, p. 40). Along with ABIO's foundation in 1984, some organic producers that commercialized their products by themselves started to seek: an associative way to sell them, as well as stimulate the knowledge exchange and promote commercialization through a common structure of sale points. (Ministério da Agricultura, Pecuária e Abastecimento [MAPA], 2007) But it was not until the beginning of the twenty-first century that regulations, sale points, organizations and public agencies converged into the scenario that is currently composed by Organic Farmers, Farmers Markets, Permanent Stores and Supermarkets, Government Institutions, Institutions of Public Private Partnership, and Non-Governmental Institutions (these represented by Participatory Conformity Assessment Bodies and Private Industries of Processing and Distribution).

As is mentioned by MAPA (2007), it is around the 1970's when market introduction was a key point for organic farmers, and generation of reliable commercialization chains was the most important tool for strengthening the links among farmers and customers. Trust of the producers and quality of products were the main concerns of farmers and customers which created norms, as those established by ABIO and by AAO in São Paulo to certify the mechanisms of organic conformity assessment. For example, the rules set by the Cooperativa Ecológica Coolméia from Rio Grande do Sul among customers associations, farmers and technicians.

Since 1995 organic products have been commercialized in Rio de Janeiro's supermarkets; but, there are still many constriction points for organic farmers such as: (1) low production quantities, (2) delivery discontinuity, (3) lack of normalization of quality production, (4) poor production and commercialization' infrastructure, (5) low capital and human resources available, (6) weak

organization of rural producers, (7) low prices of organic products, (8) limited advertisement of organic products towards customers (MAPA, 2007).

Research done in 2000 and 2001 by PESAGRO and ABIO concluded that farmers receive just 20 to 30% of the total price paid by customers for organic products at supermarkets (Fonseca, 2009; Feres, 2010). Also, we should consider that contracts between suppliers and supermarkets are not common; just 22% of vegetables and fruits producers have a contract, while the vast majority of producers (68%) have never made one (MAPA, 2007).

In recent years during an investigation carried out by Embrapa Agrobiologia and Embrapa Meio Ambiente the APOIA-NovoRural methodology was applied, which assesses indicators of environment and socioeconomic performance of rural activities: The study was performed on organic as well as conventional farms over a two year period. It was found that out of five different indexes measured by the program, the Management and Administration index is the one that presents the lowest value of performance in rural activities. This index specifically tells us that the main problems detected are: information access (18%), followed by pest control (19%), commercialization (13%), credit access (13%), water and soil management (13%), as well as lack of technical support (6%), conversion cost (6%), and customers and training (6%). (Valarini & Menezes, 2007)

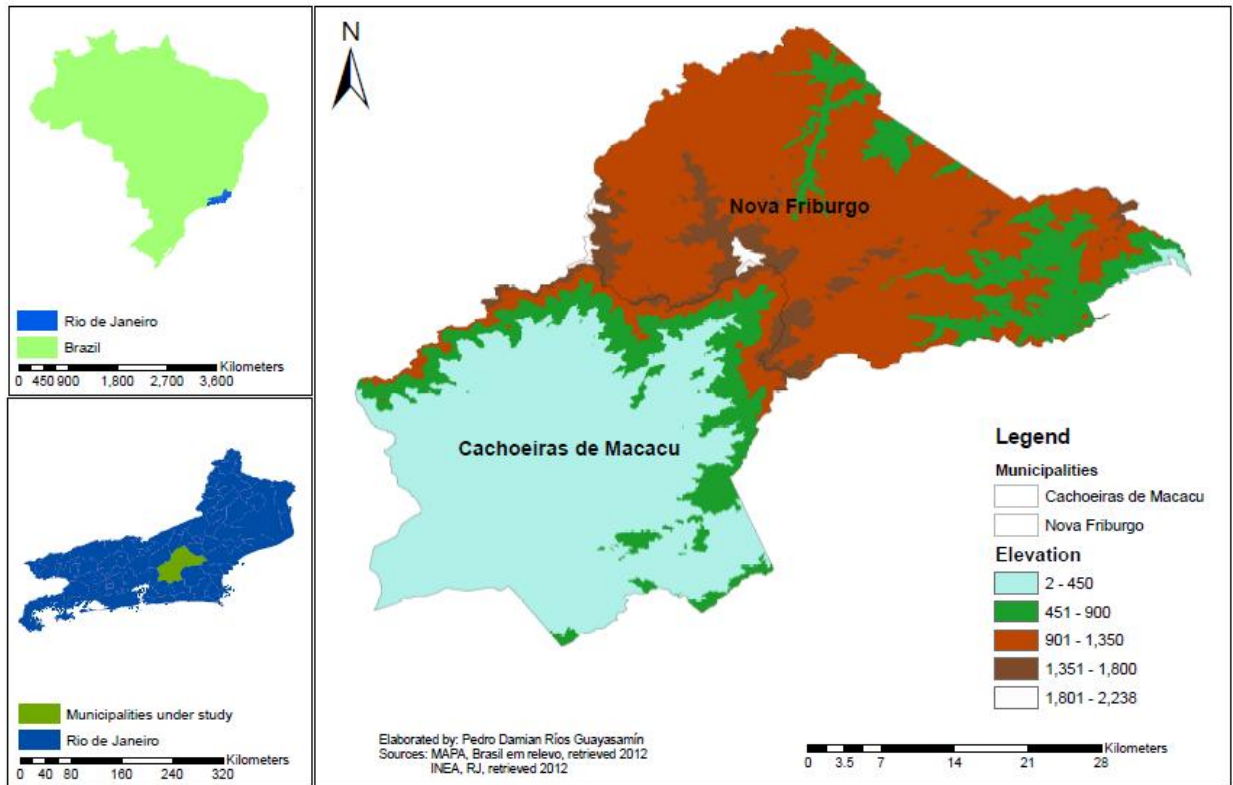
In order to provide answers to the constrains mentioned above, this research has identified the stakeholders that are currently working to develop an organic-agroecologically based production, such as: Farmers Markets, Permanent Stores and Supermarkets, organized Organic Farmers, Government Institutions, Institutions of Public Private Partnership, and Non-Governmental Institutions (these represented by Participatory Conformity Assessment Bodies and Private Industries of Processing and Distribution). The investigation has evaluated the current commercialization scenario faced by farmers from Cachoeiras de Macacu and Nova Friburgo with the markets that are already running in the region, as well as analyzed the perception of all stakeholders involved in the organic value chain of these two municipalities (see Map 1).

This investigation will be incorporated as a part of: Module IV – Participative research in rural development – of DINARIO’s project, contributing to its goal of: “Economic and ecological evaluation of land-use systems (agriculture, economic forestry and husbandry) within their specific landscape context and adaptation of those systems to the local environment as a result of participative research” (DINARIO, 2010).

Thus ensuring DINARIO’s general target which stands as: the interest of investigate the Climate change, landscape dynamics, land use and natural resources in the Atlantic Forest of Rio de Janeiro (DINARIO, 2010)

Additionally, the analysis made in organic fields has gave us indicators that confirm the enhancement of biodiversity provided by organic farming, because; as Gaese, *et al.* (2008) explains: Even though agricultural land was not considered a strong factor for biodiversity, focusing actions mainly in on-site conservation, agricultural diversity is receiving consistent attention now due the fact that the pool of crops managed specially, by “poor farming systems” is a very important resource for food security; thus making “on-farm conservation a special form of in situ conservation based on the groundwork of traditional farming and gartering methods.

*“The effects of agriculture on biodiversity are of considerable importance because farming is the human activity occupying the largest share of the total land area for many OECD countries. Ecological farming systems, agroforestry and silvo-pastoral systems, as well as perennial crops help to reduce this pressure on fragments and deforested areas.” (Gaese, et al., February, 2008)*



**Map 1. Digital elevation model and administrative area of the study case.**

## II. Research Questions

What are the weaknesses and opportunities that organic farmers face to access in an organic value chain?

What are the characteristics of the organic products that are mostly traded in the regional and local market and what are the reasons for those products being the most exchanged?

What are the policies that the Brazilian government has been taking to support organic farmers?

### III. State of the Art

Research about organic agriculture in Rio de Janeiro have been conducted for several years by representatives of: EMBRAPA Agrobiologia, PESAGRO, ABIO, SEBRAE, MAPA, Universities as UFRJ and UFRRJ and private institutions as Sítio do Moinho, Vitalfood, Organic Services GmbH among other entities that have made important breakthroughs on this matter.

In Rio de Janeiro, ABIO started to seek new ways of commercialization when they started the first organic farmers market, called “Feirinha da Saúde” at Nova Friburgo in 1985. After that in 1988 they got a stand in COBAL, a very popular market in Rio de Janeiro and since 1996 their products started to be commercialized in supermarkets (Fonseca, Almeida, Colnago, & Silva, 2009a). However, It was in 2000 that researchers started to direct their attention to the commercialization of organic products and found that just 20 to 30% of the total cost of the products was actually retained by the organic farmers (Fonseca & Nobre, 2002). In the next year this percentage increased to 30% (Campos, 2001), which was associated with worldwide emerging trends of “ecological entrepreneurs” who are looking for reliable sources of organic products (Fonseca & Nobre, 2002). In 2003, these trends led to estimations of a consistent 20% increment of the internal market of organic products in Brazil (Fonseca M. , Agricultura orgânica: Regulamentos técnicos e acesso aos mercados dos produtos orgânicos no Brasil, 2009b). The strengthening of organic sales was also related in Nova Friburgo and Teresópolis with the concern of soil and water contamination (Barros, 2011; Pereira & Martins, 2009) disseminated for the first organic farmers of Rio de Janeiro. These farmers were also known as “neo-rurais”, and were mainly agricultural technicians who look at rural activities as a calmer lifestyle. They inserted their own internal agricultural knowledge and started commercialization channels with the people in the city (Campos, 2001). By the beginning of the century these efforts were starting to show positive outcomes.

In 2004, SEBRAE started to categorize the niches of organic products in Brazil, and showed in a research study conducted in 611 commercialization channels that supermarkets and farmers markets are the most visited channels in general terms and also; pointed out that in the South Region, farmers markets were the strongest. (Fonseca M. , 2009b). However MAPA highlights that only 22% of vegetables and fruits producers have a contract, while 68% of them have never made one (MAPA, 2007). These findings have guided the path of research towards the identification of weaknesses and opportunities, strengths and threats that organic farmers were facing to access the commercialization channels.

In this line, it was found that farmers still struggled with: 1) low production quantities, (2) delivery discontinuity, (3) lack of normalization on quality production, (4) poor infrastructure for production and commercialization, (5) low capital and human resources available, (6) weak organization of rural producers, (7) low payments of organic products (MAPA, 2007; Malafaia, 2010). In Rio de Janeiro, the risk represented by (9) the existence of just a few commercialization channels available has limited the conversion of conventional farmers, as well as the (10) small quantity of professionals who can offer technical assistance (Barros, 2011). (11) The high cost of labor, (12) a low range of crop biodiversity and (13) lack of organic seed suppliers are also potential disadvantages (Pereira & Martins, 2009). Farmers also face threats such as: (1) limited potential to explore domestic markets, (2) unawareness of the subject of policy makers (Feres, 2010; Fonseca M. , 2009b) and (3) limited

advertisement of organic products (MAPA, 2007). It is considerable the intersection of factors that are commonly identified by all researchers.

A closer look into the organic farmers markets revealed that the major difficulties were (1) lack of knowledge of production costs, (2) lack of price list, (3) excessive packaging, (4) lack of production planning to maintain continuous sales, (5) low quantity and quality of products, (6) the scarcity of associative transportation, (7) waste management of residual products, (8) poor basic infrastructure at market place as well as (9) poor advertisement. Limiting factors to the organic farmers markets were: (1) small rent perceived by organic sales and (2) current customer purchase habits, which are still using supermarkets as the first way of acquire organic products (Fonseca, Almeida, Colnago, & Silva, 2009a)

Despite the drawbacks mentioned before, there are also many strengths, which support organic agriculture business, as the fact that organic agriculture which is currently practiced in more than 120 countries has experienced an increment in the crops' total growing area from 10 to 20 % annually (Tordin, 2011). These same trends are applicable to Brazil in which organic agriculture has been rising in a 20 to 30% annual rate (BIO BRAZIL FAIR 2012, 2012; Organic Services GmbH & Vitalfood Serv. de inf. na Int. LTDA, 2011). This is consistent with an organic product sales increase of 8% in supermarkets' market shares in 2011, reaching 0.3% of total supermarket sales with tendencies to keep rising (BIO BRAZIL FAIR 2012, 2012).

Farmers' strengths are based on the facts that (1) a well preserved forest remains within their land, which allows them to increase ecological synergisms and, (2) a healthy way of living is derived of farm activities and consumption of own products (Pereira & Martins, 2009). A couple of strengths found in farmers markets are: (1) knowledge exchange among farmers as well as with customers, and (2) the chance of executing social control demanded by the organic participatory assessment bodies. Furthermore, some of the biggest challenges for organic agriculture are (1) expanding farmers markets to other locations in Rio de Janeiro, (2) arising interest in young people to keep practicing organic agriculture, (3) creating partnerships among farmers from the different regions to assure volume and diversity of production and (4) developing group production planning strategies to process the products and implement agro-industries (Fonseca, Almeida, Colnago, & Silva, 2009a).

Commercialization channels for organic agriculture have been multiplying in Rio de Janeiro since ABIO started the "Feirinha da Saúde" in Nova Friburgo (Fonseca, Ribeiro, Siqueira, Machado, Silva, & Assis, 2011), and by 2000 four major channels were used by organic farmers: industries of processing and distribution which were responsible for 70% of the total volume of sales of organic products, followed by the Center of Sales and Distribution -CEASA- with a limited amount because the price does not represent an extra benefit for the farmer, supermarkets from Rio de Janeiro, and regional stores are also included but with a very small amount of sales due to their high costs and organic farmers markets such as: one Gloria in Rio de Janeiro, one in Niterói ; and also three more in the Mountain Region, but these last have just a few stands with organic products (Campos, 2001). As a result of discussions done within CPOrg-RJ, ABIO participated during the summer of 2009 in 12 farmers markets fostered by the Municipal Secretariat of Culture from Rio de Janeiro; From these events, ABIO presented a proposal that was approved a the following year, which created the Carioca Circuit of Organic Farmers Markets (CCFO) a legal term for implementing organic farmers markets along Rio de Janeiro's city, with the compromise that every fair should have the approval of

the Resident Association as well as of the Special Secretariat of Solidary Economic Development of the Rio de Janeiro Prefecture (SEDES) consent. (Fonseca, Ribeiro, Siqueira, Machado, Silva, & Assis, 2011). This fact has greatly increased the possibilities of organic product commercialization in Rio de Janeiro, and it is confirmed in a research done by the Brazilian Institute for Customer Protection - IDEC (by its Portuguese acronym) where Rio de Janeiro was occupying the third best score on farmers markets, with 15, behind Brasilia, with 18 and Recife with 17 sale points (IDEC, 2012).

Specifically in Nova Friburgo, 80% of the products commercialized in 2009 were divided among five sale points, being mainly distributed to Hortifruti, industries of processing and distribution associated with ABIO, three farmers markets and two stores of natural products; the rest of the production was commercialized through the Gloria farmers market and also by home delivery baskets, Zona Sul supermarket, restaurants from Búzios and the local CEASA. (Pereira & Martins, 2009).

In Brazil, the enlargement of organic agriculture has been not a coincidence, because discussions about regulation of organic agriculture have started in the nineties with pressure over standardization of exportations mainly of cocoa and coffee (Fonseca M. , 2005). Thus, in 1999 the first organic Normative was created, which established rules that regulate: production, certification and quality of the whole productive chain; which was in force until the Law of Organic Production - *Lei da Produção Orgânica No 10.831*- was regulated with the Decree No 6323 in 2007 (Peixoto, Neves, Guerra, & Almeida, 2008). The law of Organic Production states that: Every product called ecological, biodynamic, natural, regenerative, biological, agroecological, permanent culture and others which attest the principles of this law are considered by the Law of Organic Production as Organic Product (BRASIL, prefiraorganicos, 2003). Since December 29, 2007, organic agriculture in Brazil must meet specific criteria along the complete production system from property of rural area to its sale (Barros, 2011), and in May 2009, organic extraction was regulated through normative instruction, therefore strengthening the Brazilian body law.

Along with the regulations, entities which used to certify either national or internationally organic agriculture had to evolve based on three main paths that guaranty the law: a) farmer profile (being a family farmer or not), b) social establishment (social control or not) and c) the type of commercialization channel (direct or indirect sales). These paths were compiled according Brazilian reality into three mechanisms to guarantee the conformity assessment in: Social Control Organization for direct selling (OCS), Participatory Guarantee Systems (SPG), and Corporative External Certification (Fonseca, Ribeiro, Siqueira, Machado, Silva, & Assis, 2011). Organic Bodies for conformity assessment are: Participative Conformity Assessment Bodies (OPAC), which relies on SPG as the operational way of certification; Conformity Assessment Organisms - Certification by Audit (OAC), which relies on corporative external audit as certification procedure and OCS that does not have an organic seal, which is legitimated just by direct sell. These mechanisms have been shaping the commercialization and certification arena until today. Research done in 2007 found in Brazil that there were: 13 national certification entities and 3 foreign institutions (Feres, 2010); and by 2009 were 32 of them (Abreu, Kledal, Pettan, Rabello, & Mendes, 2009). These authors did not classify the certification entities into the three ways of certification typified by the Law of Organic Production, however Fonseca et al., (2011), based on a MAPA cadastre, mentioned that there were four OACs, three OPACs and 58 OCS that exist.

With the effective enactment of the Law of Organic Production in early 2011, it is expected that consumption as well as production will have a leap in Brazil, in the same way that has occurred in other countries after the emission of their respective organic regulations (Organic Services & Vitalfood, 2011).

Customers have also been object of research to see how the demand grows and what the public expectation of organic products is. IDEC in its internet survey showed that 74% of customers will buy more products if they were more convenient and 20% would increase their sales if they have closer stores or farmers markets (IDEC, 2012). In another study, customers declared that they chose their commercialization channel based on (hierarchically) : the quality of the product, good price and easy access (Organic Services & Vitalfood, 2011). In Rio de Janeiro, all of the stores interviewed stated that their products come mainly from the Mountain Region. Also the majority of products were sold in the South Zone of the city. The same source mentioned that legumes and vegetables are the most important products, accounting: Japanese lettuce, iceberg lettuce, broccoli and cauliflower as the most exchanged vegetables as well as mandarine and tangerine for the most popular fruits. As was found in other studies, the lack of continuity and high prices were considered weaknesses in the system (Oliveira, 2006).

In this context, the aforementioned research has gathered information from all the above stated stakeholders in order to draw a characterization of the current situation of organic business in two municipalities. To evaluate, we will use the value chain approach to characterize the different organic enterprises that are present in these two municipalities, as well as the organizations working with them. In this regard, the research was designed to embrace stages of the chain from production to final sale points, taking the “organic production of both municipalities” as a subsector of study. The study provides a global view of the organic value chains, which are developed into the system of commercialization, furthermore presenting detailed information on the products that they are supplying and equipping this data with enough values to give farmers the chance to better plan their decisions in the long run. With this effort, it is expected to fill the gap of planning, and give tools to decision makers so they can categorize hierarchically the next steps which need to be done in research and extension. This methodology can be replicated in other places to increase the knowledge of the value chains of organic agriculture as well as to interlink actions for suitable regional strategies.

#### **IV. Objectives**

##### **A. General objective**

- Characterization of the global value chains of organic products in Cachoeiras de Macacu and Nova Friburgo - Rio de Janeiro, Brazil.

## B. Specific objectives

- Identify the organic farmers from Cachoeiras de Macacu and Nova Friburgo, their products and the quality that they can provide.
- Analyze weaknesses and opportunities of organic farmers as well as their linkages with organizations of organic commercialization and running markets.
- Analyze the Brazilian government's role, and the laws and rules that may constrain or enhance the opportunities of organic farmers of Cachoeiras de Macacu and Nova Friburgo to access the organic market.

## V. Reference Framework

### A. Policy – Evolution of the Brazilian Law Nº 10831 that was published on December 23rd, 2003 of the Organic Agriculture and Livestock Production System (Law of Organic Production) and its regulations.

In the 1990s, along with the beginning of the exportation of coffee and cocoa to Germany started a pressure coming from the High Income Countries to legally recognize organic certifiers from Low Income Countries; those entities were represented by: the Biological Farmers Association of the State of Rio de Janeiro (ABIO), the Organic Agriculture Association of São Paulo (AAO) among others that used to work with other certification methods, based on agreements among customers and producers or notes to certify the origin of the products. This pressure has increased with the approval of the law CEE 2092/91 by the European community<sup>8</sup>; which regulates the labeling of organic products among the European members. In April 1995 was created a National Committee of Organic Products with key actors in that moment: NGOs (AAO, ABIO, APTA, COOLMEIA, and IBD), the Ministry of Agriculture, Livestock and Supply (MAPA), the Brazilian Agricultural Research Corporation (EMBRAPA), Universities and The Environmental Ministry; they worked for two years deliberating about technical properties for the organic regulation (Fonseca M. , 2005).

After a short period of stagnation on the matter, by 1999 was created the first Organic Normative (IN007/1999) in Brazil which established rules that go through: production, certification and quality of the whole productive chain of organic products, see **Annex 1** (Peixoto, Neves, Guerra, & Almeida, 2008). In this period was also established the National Organic Production Committee -CNPOrg- as well as its peer counterpart in each State; The CNPOrg was constituted by 5 members from public institutions and 5 of non-governmental institutions. By 2001, there were 13 operational Organic Production Committees in the Federation Units (CPOrg-UF) in the equal number of Brazilian States (Fonseca M. , 2005).

In 2002 many tensions rose because in the Normative Instruction 006/02 (IN006/02), it was not considered historical processes of conformity assessment, such as the participative certification

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<sup>8</sup> Detailed information may be found at: <http://eur-lex.europa.eu/LexUriServ/site/en/consleg/1991/R/01991R2092-20070101-en.pdf>



process (which later will be called Participatory Guarantee Systems -SPG-) held for many years by many entities like for example: Rede ECOVIDA. This exclusion was originated due to the fact that IN006/02 was based on ISO 65 criteria, which explicitly states as prior condition for certification institutions: impartiality and independency of the Certification Body from the certified entity, and this reason was going totally against of social traditional processes developed by farmers all over Brazil. However, the IN006/02 would allow group certification as a valid certification path, demanding just a set of internal rules made by the association of farmers or the farmers group as accredited methodology to access the certification (Fonseca M. , 2005).

For the reason exposed in the above paragraph, even when in 2003 IBD and Certifica-RS (two certification bodies) had all documents ready to start the accreditation process there was not enough clearness about the procedures about how to do the certification, in part because internal conflicts in MAPA hindered the steps to be taken as well as the communication with other related Ministries in order to facilitate the process of registration among governmental entities (Fonseca M. , 2005).

All these factors contributed to joint repudiation of IN006/02, the same that was declared at the National Agroecology Meeting held in August of 2002. As a result of these events, the Group of Organic Agriculture (GAO) was constituted and it was launched a virtual platform to have a crossed conversation among all Brazilian organic stakeholders. GAO was afterwards one of the actors actively participating in the reformulation of the former regulations into what is now known as the Brazilian Law of Organic Production “Lei da Produção Orgânica No 10.831”, approved and published in December 2003 (Fonseca M. , 2005)

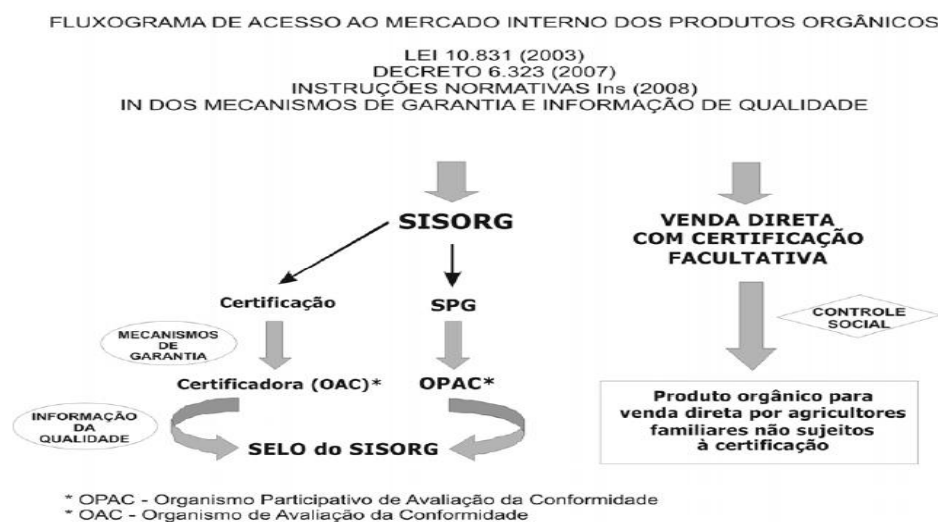
The Law of Organic Production establishes that “Every product called ecological, biodynamic, natural, regenerative, biological, agroecological, permanent culture and others are considered by Organic Law as Organic Product -Lei da Produção Orgânica No 10.831” (Soares, Salman, Aroeira, Fonseca, Silva, & Fagundes, 2012). This was the beginning in Brazil of a constant evolution on regulations and normative which are looking to include all the stakeholders covered by the organic agriculture umbrella.

In order to establish regulations for the Law of Organic Production, in 2004 it was constituted the Sectorial Chamber of Organic Agriculture (CSAO); a consultative organism to promote the construction of organic regulations, which aims to approach all Brazilian stakeholders and propound public policies and regulations about organic agriculture. CSAO had as attributions: to discuss and present propounds for regulation of the Law of Organic Production, to elaborate the Working Plan of the Organic Agricultural Development Program -Pró-Orgânico-; to regulate the CNPOrg as well as CPOrg-UF as well as to design the labeling of organic products (Peixoto, Neves, Guerra, & Almeida, 2008). The Chamber was composed of 26 members among public and private institutions. (Fonseca M. , 2005)

In July of 2004, MAPA issued an ordinance to certify organic products through the process of regulation according to the Law of Organic Production; this Ordinance had not considered the National Institute of Metrology, Quality and Technology (INMETRO) as Brazilian organism of regulation, therefore is ISO65 which was ruling the certification process. This ordinance triggers the separation of activities in the entities that used to certify organic agriculture, leaving training and assessment as a direct function of NGOs and making a specific branch to certify organic products; as

example IBD divides its functions to IBD Certifications and IBD Foundation to meet the requirements of ISO 65 (Fonseca M. , 2005). Currently ISO 65 is under revision, estimating new guidelines by mid-2012 (IOAS, 2012).

In 2005, a commission of CSAO summarized all the regulations presented up to that point. In this period it was also admitted by law that direct sales had not a mandatory requirement of organic certification, which opened the door to the inclusion of family farmers and SPG as viable options to access governmental purchase programs (PAA) of organic products (Karam, Fonseca, Grizante, & Carvalho, 2006). Finally, in this year were institutionalized the procedures to regulate organic agriculture in Brazil which were based on: a) farmer profile (being family farmer or not), b) social establishment (social control or not) and c) the type of commercialization channel (direct or indirect sales) (Fonseca, Ribeiro, Siqueira, Machado, Silva, & Assis, 2011).



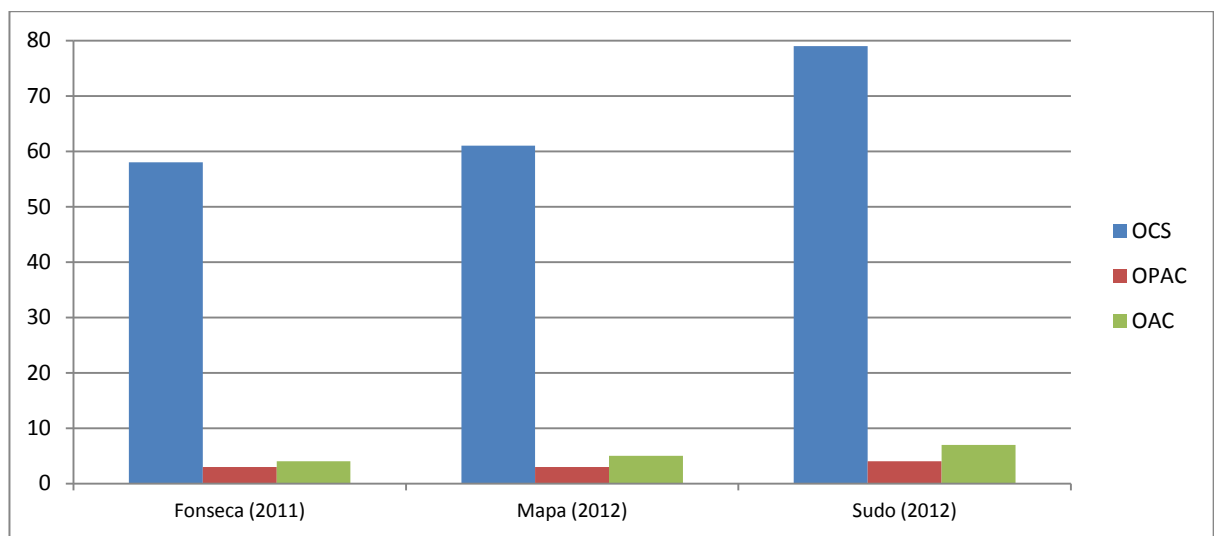
**Figure 1. Mechanisms to guarantee the conformity assessment from the Brazilian Law of Organic Production.**

Source: Fonseca M. (2009b) page 46

Decrees and normative instructions issued between 2007 and 2009 to regularize organic agriculture in Brazil allowed that in 2009 (**Annex 1**) Brazil had established three mechanisms to guarantee the conformity assessment; which are: Social Control Organization for Direct Sales (OCS), Participatory Guarantee System (SPG) and external corporative certification, to guarantee the conformity of the organic production regulations. The last two of these mechanisms: SPG and external corporative certification have to fulfill the Brazilian Organic Conformity Assessment System (SisOrg). From there on, entities to control the conformity assessment mechanisms were institutionalized. Participatory Conformity Assessment Bodies (OPAC) are created to assess the conformity of SPG, and in the same way, Conformity Assessment Organisms - Certification by Audit (OAC) are created to assess external corporative certification (**Figure 1**). In the aim to include family farmers in the process of direct selling of organic products, the Organic Family Farmers' Associations accredited by MAPA which work under OCS are allowed to sell organic products to the final customers through direct selling (Fonseca M. , 2005) or governmental food acquisition programs such as the National School Feeding Program (PNAE) and the Food Purchase Program (PAA) fostered by Federal organisms which aim at first the help to family farmers.

All Organic Conformity Assessment Bodies have to be accredited by MAPA. In the case of OAC the accreditation of ISO65 would be required prior the official approval by MAPA; the accreditation of ISO65 is now supervised by INMETRO. The OPAC shall not go through that process but they require being audit by the Agroecology Coordination of the Secretariat for Agricultural and Livestock Development and Cooperativism of the Ministry of Agriculture, Livestock and Supply (COAGRE/MAPA) (Fonseca M. , 2009b).

According to Normative Instruction MAPA No. 19, May 28, 2009; the entities that want to become part of the Brazilian Organic Conformity Assessment System (SisOrg) shall address their inquiry to the Federal Superintendence of Agriculture (SFA/MAPA) from their State. At the same time they will need to inform the scope of work. The normative details 12 scopes (BRASIL, prefiraorganicos, 2009); in this research it was found that as example, ABIO had registered all scopes determined by law (**Annex 3**).



**Graphic 1. Growth of entities which complied the Organic production mechanisms to guarantee the conformity assessment, based on different sources.**

Source: Author's elaboration. Based on: Fonseca, et al. (2011) MAPA, Prefiraorganicos (2012) and A. Sudo, personal communication, April 2, 2012. OCS: Social Control Organization for Direct Sales; OPAC: Participatory Conformity Assessment Body; OAC: Conformity Assessment Organism - Certification by Audit

In 2003, Brazil had 30 organizations regulating organic agriculture. Since then, small enterprises either disappeared or have made fusions with other to rationalize production costs (Fonseca M. , 2009b). By 2007, Feres found that in Brazil were working 13 national certification entities and 3 foreign institutions (Feres, 2010). In 2009, it was reported that 32 certifiers of ecological-based agriculture were working in the country. From them IBD was the most important with 3500 farmers and more than 100 products certified (Abreu, Kledal, Pettan, Rabello, & Mendes, 2009). These authors did not classify the certification entities into the three ways of certification typified by law. However in 2011, based on a MAPA cadastre, Fonseca mentioned that Brazil has registered: 4 OACs, 3 OPACs and 58 OCS (Fonseca, Ribeiro, Siqueira, Machado, Silva, & Assis, 2011).

In 2011 the number of institutions registered under the three categories determined by law had increased. MAPA shows in its web page: 5 OACs, 3 OPACs and 61 OCS (MAPA, prefiraorganicos,

2012) and this research had compiled information with sources of January 2012 which shows the existence of: 7 OACs, 4 OPACs and 79 OCS (**Graphic 1**).

The information collected in this research represents an increase of: 43% OACs, 25% OPACs and 23% OCS since the dead line for accreditation of organic bodies which already had been working on organic agriculture (**Annex2**). The closing date for registration of organizations that have been providing certification for organic agriculture was December 28, 2009 the same date was applied for the regularization of organic family farmers' associations that have been working with direct selling.

In Rio de Janeiro, ABIO, a Participatory Conformity Assessment Body (OPAC) which provided this service with low cost to its affiliates (Feres, 2010; Fonseca M., 2005), saw after the SisOrg approval that its role as certification body was threatened since the costs required to fulfill the regulations and the subsequent certification costs were too high to be implemented for its farmers (Feres, 2010).

The issue was also perceived by other small certification-bodies (ANC, Chão Vivo and Minas Orgânica). They concluded that they could not survive alone to absorb the costs derived from ISO65 approval which was required by INMETRO. These costs were estimated around R\$ 800 reais for individual farmer per year. In a jointly effort with the other certification bodies mentioned above ABIO tried to consolidate the Brazilian Network of Conformity Assessment (REBRAC). Hence, REBRAC would be the Certification branch of all four institutions to consolidate the project, and the former certifiers would pass to bring extension services to its affiliates (Feres, 2010; Pereira & Martins, 2009).

Unfortunately, the consolidation process had failed, because one of its members gave up the project. For this reason ABIO adopted the guidelines to certify its members under the SPG modality, grouping its members on ABIO's cores (Feres, 2010) which are generally located around an important city-point of commercialization. ABIO was accredited as OPAC by MAPA in December, 2010 (Fonseca, Ribeiro, Siqueira, Machado, Silva, & Assis, 2011).

The SPG is basically composed by two components: the members and the OPAC. The members are legal entities or/and natural persons who make a group; this group in turn is classified in two categories: Suppliers and Collaborators (BRASIL, prefiraorganicos, 2009). The suppliers could be: farmers, processors, distributors, traders, transporters, stockers and staff who makes sustainable extractivism while collaborators are: customers and its associations, technicians, public or/and private institutions, NGOs, and other stakeholders (Fonseca M. , 2009b).

In order to expand its commercialization potential and reinforce the SPG; ABIO presented a proposal to the Municipal Secretariat of Culture from Rio de Janeiro that was approved a year later; which created the Carioca Circuit of Organic Farmers Markets –CCFO- a legal term for implementing organic farmers markets along Rio de Janeiro's city, in partnership with the Special Secretariat of Solidary Economic Development of the Rio de Janeiro Prefecture -SEDES- and Resident Associations of Rio de Janeiro (Fonseca, Ribeiro, Siqueira, Machado, Silva, & Assis, 2011).

In Nova Friburgo one of ABIO's collaborators is the Agricultural Research Corporation of the State of Rio de Janeiro (PESAGRO), a public institution that has studied the insertion of organic products into short commercialization chains of Rio de Janeiro's markets. They concluded that there is still a very

poor participation of organic farmers in institutional markets such as PAA and PNAE (Fonseca M. , 2009b). PAA and PNAE are programs that generally overpay about 30% for organic and ecologic products (Caporal, 2009). Based on the data provided by personal communication with the coordination of the Organic Production Committee in Rio de Janeiro (CPOrg-RJ), even when the average of OCS has increased in the past two years, there is not a single organism registered in Rio de Janeiro (**Chart 1**).

**Chart 1. Brazilian Social control organizations for direct selling registered at MAPA, based on personal communication retrieved from the coordination of the Organic Production Committee of Rio de Janeiro.**

Mechanism of conformity assessment	State	Number of farmer cooperatives		Total family farmers	
		2011	2012	2011	2012
Social control organizations for direct selling - Organic farmer cooperatives registered at MAPA	AC		1		51
	CE		1		14
	DF	2	3	14	21
	ES	5	5	138	138
	GO	1	1	3	3
	MG	1	2	5	19
	MT	2	7	54	71
	PA	1	1	18	18
	PB	8	9	164	172
	PE	17	19	261	362
	PI	6	9	96	138
	PR	1	1	6	6
	RN	2	3	32	51
	RR	2	2	10	10
	RS	3	4	113	126
	SE	7	8	90	105
	SP	3	3	24	25
Total		61	79	1028	1330

Source: Author's elaboration based on: A. Sudo, personal communication, April 2, 2012

The difficulties in the adoption of Federal programs as PNAE and PAA rely on farmers' unawareness on the existence of the programs, farmers' organization problems as well as the requirements to obtain the Declaration of Aptness for PRONAF (DAP), declaration of the family farmer income that mainly should come from agricultural activities. DAP is the enabling document to access those markets (Fonseca M. , 2009b) and without approval of the National Program of Family Agriculture Strengthening (PRONAF) is even more complicated to access to the governmental markets. Similar findings for other policies addressed to family farmers were exposed in Teresópolis, in this municipality, BLUMEN project described that there was a small percentage of people able to have access to PRONAF (credit program for family farmers), mostly owners. Sharecroppers, the majority of farmers, struggled to get the credit because they did not have goods to present as a guaranty (Torrice, Mino, Barreiro, Friederich, & Barbosa, 2006). Thus, we can see both sides of the medal, in one side people with other income sources different from agriculture cannot access to PRONAF or DAP and people who does not have goods are also restricted to have approval for PRONAF hampering the access to public programs.

The Corporation for Technical Assistance and Rural Extension of the State of Rio de Janeiro (EMATER-RJ) has informed us in this research that the programs currently available where organic farmers can apply are: Cultivar Orgânico<sup>9</sup> (a credit line for organic farmers), PRONAF Agroecologia<sup>10</sup>

<sup>9</sup> Detailed information about Cultivar Orgânico may be found at: <http://www.rj.gov.br/web/seapec/exibeconteudo?article-id=167059>

<sup>10</sup> Detailed information about PRONAF Agroecologia may be found at: [http://www.bndes.gov.br/SiteBNDES/bndes/bndes\\_pt/Institucional/Apoio\\_Financeiro/Programas\\_e\\_Fundos/pronaf\\_agroecologia.html](http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoio_Financeiro/Programas_e_Fundos/pronaf_agroecologia.html)

(a credit line for agroecological entrepreneurs) and Prosperar<sup>11</sup> (credit program addressing agroindustry). However, for the first two it is required PRONAF approbation, hindering the application of organic farmers who have other source of income.

The Brazilian Service of Assistance to Micro and Small Enterprises of Rio de Janeiro (SEBRAE-RJ) in partnership with the National Agricultural Society -SNA- is also implementing a program called Intelligence Center in Organics (CIOrg); the project aims to identify, collect, analyze and disseminate strategic information to implement a data base for public access. The data available shall provide information about indicators of: property, infrastructure, production, agricultural practices, management and commercialization of organic products (Organicsnet, Organicsnet, 2012a). The project has started on Mar 10, 2012 and already has gathered information in Nova Friburgo with meetings held on April 27 and 28, 2012. In the meetings, Academics from the Federal Rural University of Rio de Janeiro (UFRRJ) have applied a participatory rural appraisal to identify bottlenecks on the organic production system (A VOZ DA SERRA, 2012)

At national level there are several specific programs in Brazil addressing organic agriculture in different levels: “prerfira organicos” and others by MAPA, Programa Nacional de Apoio à Agricultura de Base Ecológica nas Unidades Familiares de Produção and its application to organic agriculture, supported by the Ministry of Agricultural Development (MDA); the Projeto Orgânicos Brasil: an initiative of the Brazilian Trade and Investment Promotion Agency (APEX-Brasil) supported by the Ministry of Industry, Development and International Affairs (MIDC). Finally EMBRAPA owns a decentralized research unit, the Embrapa Agrobiologia - National Center of Agrobiologia Research (EMBRAPA Agrobiologia) where, organic agriculture is one of its main points of interest. (PROARGEX, 2010).

It is important to quote that the incorporation of organic agriculture regulations is a rising trend. In 2009 the numbers of countries with organic regulations have reached 74 while in 2010 this number rose to 84 countries (Willer, 2012). It was expected that with the effective came into force of the Law of Organic Production, at the beginning of 2011, there would be an increase in consumption and production like it has happened in High Income Countries after the edition and publication of their respective Laws of organic production (Organic Services & Vitalfood, 2011).

## **B. Agricultural background – Delineating the scope of organic agriculture in Rio de Janeiro.**

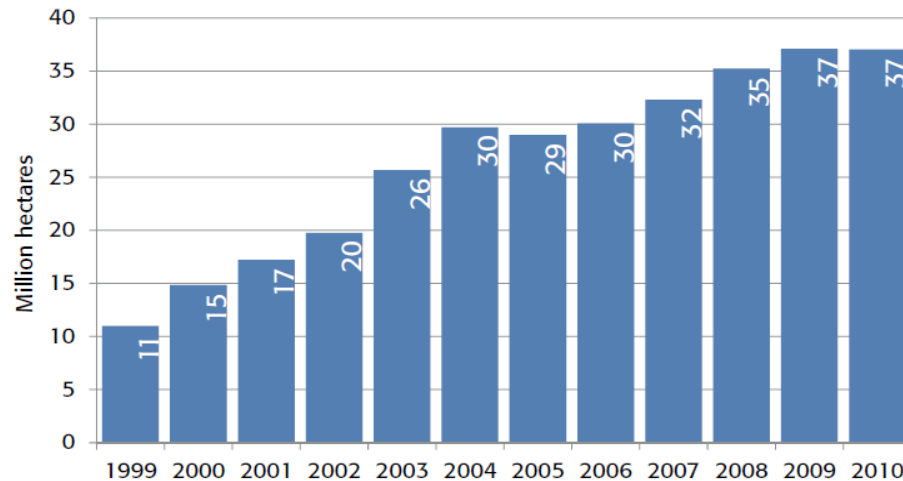
The organic movement is a recent business that has been consistently growing in the last few decades. There has been an increase over three fold of the global farm land over the 12 last years, and approximately 1.6 million organic farmers from 160 countries planted 37 million hectares (ha) across the world in 2010 (**Figure 2**). The leading countries in organic agricultural land are Australia with 12 million ha, Argentina with 4.2 million ha and United States with 2.9 million ha (Willer, 2012)

The global amount of sales estimated in 2010 was US\$ 59 billion (Willer, 2012), very close to the estimations of 20% annual increase made in 2009 which gave a total prediction of US\$ 60 billion by 2010 and US\$ 100 billion by 2012 (Fonseca M. , 2009b). However the second prediction could be

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<sup>11</sup> Detailed information about Prosperar may be found at: <http://www.rj.gov.br/web/seapec/exibeconteudo?article-id=174902>

mismatched, since the area of agricultural land has decreased by the end of 2010 due to slight declines of agricultural land area in Asia, mainly in India and China. The countries with the biggest market size are: United States with US\$ 26.7 billion followed by Germany with US\$ 8.2 billion, and France with 4.7 US billion dollars (Willer, 2012).



**Figure 2. Growth of organic agricultural land from 1999 to 2010, according to IFOAM and FiBL.**

Source: FiBL-IFOAM-SOEL Surveys 2000-2012, based on data from governments, the private sector and certifiers.

According to Organic Services & Vitalfood, (2011), even when the consumption of organic products in the world is less than 5% the tendency is to rise in the coming years; which is a point of view shared by Willer (2012), which remarks that although sales have slowed in 2008 in the global market, organic products have been constantly increasing at a healthy pace. This assumption relies on the fact that apart of organic crops farm land, areas for grazing, aquaculture and forest which are non-agricultural land are contributing with another 43 million ha. The leading countries of non-agricultural organic lands are: Finland with 7.8 million ha, Brazil with 6.2 million ha and Cameroon with 6 million ha.

Latin America holds 23% of the worldwide organic agricultural land with 8.4 million ha (Willer, 2012), showing a fair increase with respect to the estimations of 2007, where the total certified land in South America was 6.4 million ha (Fonseca M. , 2009b). The leading countries in Latin America on agricultural land are: Argentina with 4.2 million ha, Brazil with 1.8 million ha and Uruguay with 0.9 million ha (Willer, 2012)

In the world 80% of the organic producers come from either Africa, Asia or Latin America, where the last has a contribution of 17% of the worldwide farmers distribution with more than 270,000 organic producers (Willer, 2012). Latin American production is mainly export-oriented due to distribution problems which lead to the impossibility for paying a premium for the price of the products (Fonseca & Nobre, 2002). Nonetheless South Africa (in Africa) and Brazil (in Latin America) have the best local market for organic products, especially in cities (Van Elzakker & Eyhorn, 2010).

Even though Brazil is the largest consumer of organic products in Latin America, this consumption does not reach 1% of the total internal food market (Tordin, 2011). However growth is very promising, for internal market as well as exportation (Organic Services & Vitalfood, 2011). This can

be seen in the increment of sales at supermarkets, which in 2001 experienced an 8% increase of sales and reached 1.2 billion Brazilian reais. This shows that among ABRAS supermarkets, São Paulo is the best market for organic products, as it represents 54% of the total share, followed by Pará with 11.7% and Minas Gerais with 7.94% (BIO BRAZIL FAIR 2012, 2012).

Organic agriculture in Brazil is a constantly rising trend with very optimistic projections that range from a 50% annual increase to the organic market (Gemma, Tereso, & Abrahão, 2010) to more conservative estimations which place the development from a 20 to 30% annual rate (BIO BRAZIL FAIR 2012, 2012; Organic Services GmbH & Vitalfood Serv. de inf. na Int. LTDA, 2011).

Brazil accounts as one of the leading countries worldwide with approximately 880,000 ha occupying the 8th position among the major country producers of ecological-based agriculture (Abreu, Kledal, Pettan, Rabello, & Mendes, 2009). If we join the agricultural and non-agricultural production, Brazil reaches the second place worldwide in productive land with 11.8% (Tordin, 2011), this result is obtained when we add the values reported at “The world of organic agriculture 2012: Summary” of 6.2 million ha of non-agricultural organic areas (mainly wild collection) (Willer, 2012) to those values presented in “Organic Agriculture Worldwide Key results from the survey on organic agriculture worldwide 2012” of 1.77 million ha of agricultural land (FiBL & IFOAM, 2012).

Ecological-based agriculture in this country has established around 15 to 19 thousand farmers (IBGE, 2006; Abreu, Kledal, Pettan, Rabello, & Mendes, 2009), where the majority (90% of the total) are represented by family farmers. They accounted for 90,497 establishments that corresponded to 1.75% of the total agricultural establishments in Brazil (IBGE, 2006). More recent studies have estimated organic farmers number around 12,000 (Organic Services & Vitalfood, 2011) where family farmers represent about 70% to 85% of the controlled units of “organic agriculture” (Fonseca M. , 2009b; Fonseca, et al., 2011).

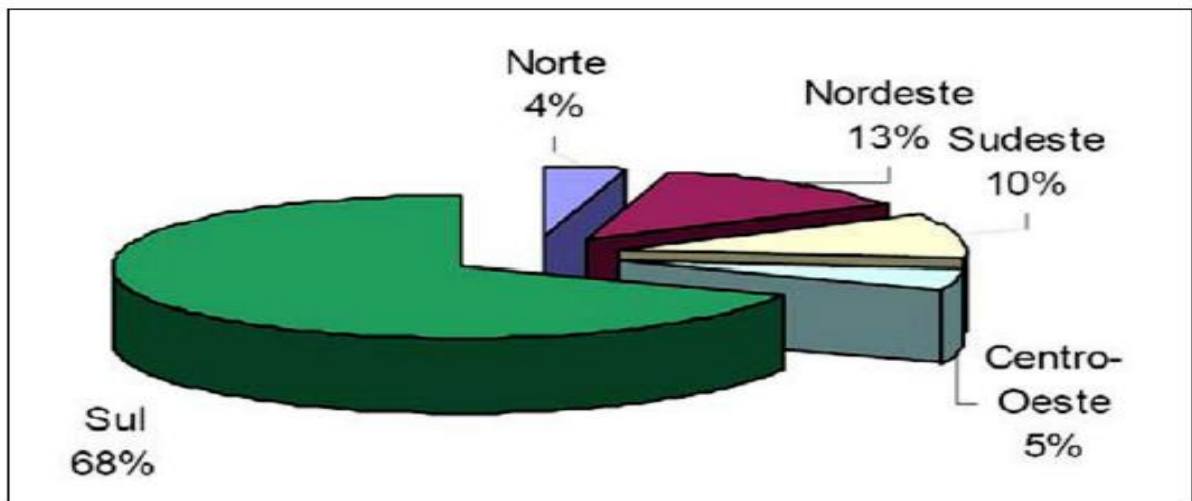


Figure 3. Share of Brazilian organic agriculture by region in 2010, according to PROARGEX 2010.

Source: PROARGEX, 2010

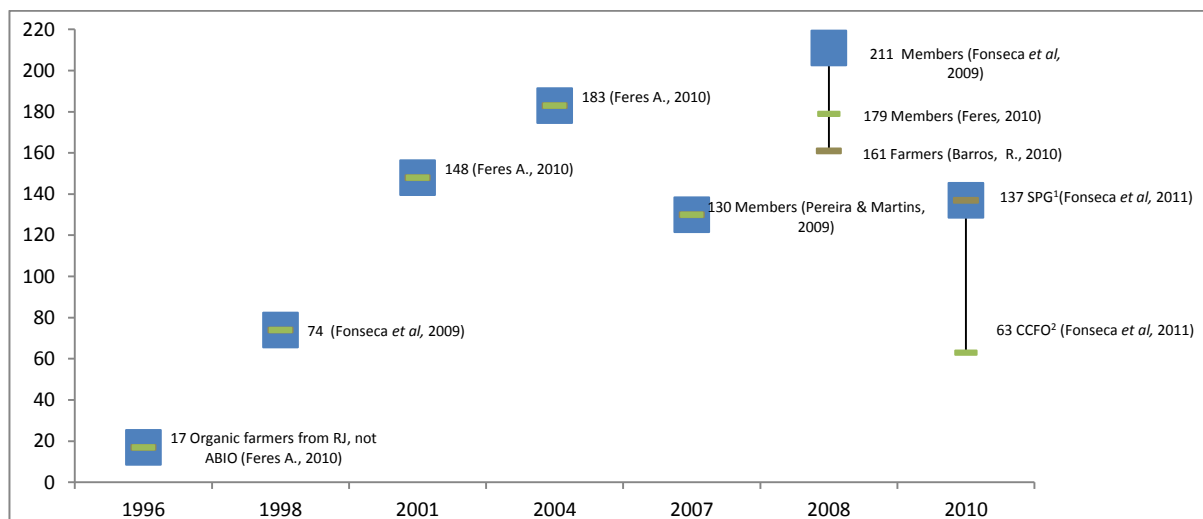
Approximately 70% (Figure 3) of Brazil's organic production was located in the South and Southeast regions (Abreu, Kledal, Pettan, Rabello, & Mendes, 2009; PROARGEX, 2010). In more recent studies, this percentage has increased to 80% in the same regions (Organic Services & Vitalfood, 2011).



In the South Region stands Brazil's metropolis, the big scale horticulture production, and it concentrates the majority of Organic Certifiers. In this region, organic agriculture is being raised as a viable alternative for small and medium size farmers as well as agroindustries, (specifically organic cooperatives and organic associations, which are organized in an efficient and modern way), and the State of Parana is the major producer of the region, which also has the highest variety of products. The main organic products found here in the South Region are: coffee, cacao, fruits, milk, vegetables, flowers, honey, grain, tee and mate leaves. (PROARGEX, 2010).

Rio de Janeiro, as a part of the Southeastern cities with its 15,180,636 inhabitants (IBGE, 2010), has the second main consumer market of the country; and is not even able to supply 50% of the demand, receiving vast inputs from neighboring states (Egger, 2010). In 2009, the state of Rio de Janeiro was able to supply 36% of horticultural products and only 8% of fruits. São Paulo contributes with 39% of the fruits supply and 20% of horticulture whilst Minas Gerais provides 12% of fruits and 26% of horticultural products (Posdena, Jansens, & Torrico, 2009).

In the conventional market, sugar cane is the main crop of the State of Rio de Janeiro which represents more than 52% of the total cultivated area and exceeds largely the second most cultivated crop represented by banana plantations. (Posdena, Jansens, & Torrico, 2009) According to the National Agricultural Census of 2006, the most important annual crops in terms of production are lettuce, tomato, manioc and watercress. (IBGE, 2006). BLUMEN has analyzed Teresópolis production and described that 95% of its production is sold in Rio de Janeiro, most of them at CEASA (at first in CEASA-Grande Rio, but also in CEASA-São Gonçalo). The rest goes to farmers markets in the Mountain Region and Ubá Region in Minas Gerais (Torrico, Mino, Barreiro, Friederich, & Barbosa, 2006).



**Graphic 2. Evolution of ABIO members by different sources from 1996 to 2010.**

Source: Author's elaboration; based on the list above stated.

<sup>1</sup>ABIO Members; <sup>2</sup>Suppliers of Circuito Carioca de Feiras Orgânicas (Carioca Circuit of Organic Farmers Markets)

Organic production is constantly increasing in Rio de Janeiro; nonetheless the number of farmers is still restricted<sup>12</sup>. ABIO accredits to the vast majority of organic farmers in Rio de Janeiro, who are

<sup>12</sup> Ribeiro, C., personal communication, April 5, 2012

organized in groups of the Participatory Guarantee System -ABIO cores- (Barros, 2011; Feres, 2010) which were distributed in 2011 along eleven municipalities (Fonseca, Ribeiro, Siqueira, Machado, Silva, & Assis, 2011). It is possible that ABIO may be reaching a stabilization point in its number of affiliates, due to the fact that organic products are coming from other regions too, especially from São Paulo (Feres, 2010). The variation of ABIO's members can be seen in the data compilation of historical changes of ABIO affiliates presented in **Graphic 2**. According to ABIO's president, in the first semester of 2012 ABIO had 192 members<sup>13</sup>

According to the ABIO cadastres of 2000, horticulture is the most disseminated activity among organic farmers with 73% of the farmers participating this activity (**Table 1**). Those findings agreeing with a research done in 2004 in the municipality of Rio de Janeiro, which shows that: legumes (81.7%) and vegetables (61.35) are the most important products among 126 organic product sale points, the research denotes that: Japanese lettuce, iceberg lettuce, broccoli and cauliflower are the most exchanged vegetables and mandarine and tangerine are the most sold fruits. The products come mainly from the Mountain Region, and are mostly sold in the South Zone of the city where stands the population with the highest income (Oliveira, 2006). Organic farmers represent 3,4% of the farmers from the whole state of Rio de Janeiro (Barros, 2011).

The main difficulties found in Rio de Janeiro to increase the consumption of organic products are the high prices and the lack of information about the advantages of organic product consumption (Oliveira, 2006). Nationally 76% of the customers considered that organic products are too expensive (Organic Services & Vitalfood, 2011) while 74% of them would buy more if they had lower their prices (IDEC, 2012). The strategies suggested by the organic product sale points of the municipality of Rio de Janeiro to increase organic sales were: the divulgation information among customers (45.2%), price reduction (19.4%) and an increase in supply and commercialization points (12.9%) (Oliveira, 2006).

**Table 1. Number of ABIO members and their share of production by organic crops in 2000.**

Products	Farmers	%Farmers
Fresh	183	100
Horticulture	131	72.8
Fruits	89	48.6
Tubers and cereals	10	5.5
Coffee and sugar cane	12	6.6
Milk	14	7.7
Aviculture	19	10.4
Others	10	5.5
Processed products	20	10.9
Horticulture & Jelly fruits	9	4.9
Canned fruits, etc.	6	3.3
Others	5	2.7
Others	3	1.6
Humus & eucalyptus	3	1.6

Source: ABIO, 2000 (In: Barros, 2011)

Bottlenecks on the commercialization process described by managers at farmers markets are divided into several disadvantages: the lack of knowledge of production costs, lack of price list, the

<sup>13</sup> Ribeiro, C., personal communication, April 2, 2012

excessive packaging of organic products, the lack of production planning to maintain continuous sales, low quantity and quality of the products, the scarcity of associative transportation, the waste management of residual products, poor basic infrastructure at market place as well as poor advertisement. Limiting factors are: the small income perceived by product sales and the current customer purchase habits, which are still using supermarkets as the first way of acquire organic products (Fonseca, Almeida, Colnago, & Silva, 2009a). Organic farmers from Nova Friburgo interviewed in 2008 concluded that: the high cost of labor, low range of crop biodiversity and the lack of organic seed suppliers were the main issues for organic agriculture (Pereira & Martins, 2009).

The consumption of organic products seemed to increase with the age, the education and the amount of rent of organic consumers. The regular consumers of organic products have in average 51 years and 66.3% of them are over 45. People who do not consume organic products have in average 46 years with 49.4% of consumers over 45 years. Consumers perceived as positive factors that: organic products do not have agrototoxics (79.9%), they are healthier than conventional products (60.3%) and have not chemicals on them (53.1%) (Oliveira, 2006) In 2010 a national research also found that people was buying organic products because they do not have agrototoxics (36%) and because they are part of a healthy lifestyle (48%) (Organic Services & Vitalfood, 2011).

Managers of Farmers markets have presented as positive points: the exchange of knowledge among farmers and customers, and the chance of executing social control demanded by the organic participatory assessment bodies (Fonseca, Almeida, Colnago, & Silva, 2009a). Organic Farmers from Nova Friburgo have described that the strengths in organic production are based on the fact that a well preserved forest remains within their land, which allows them to increase ecological synergisms and a healthy way of living (Pereira & Martins, 2009).

## **1. Commercialization chains evolution in the municipalities under study**

Commercialization channels for organic agriculture have been flourishing in Rio de Janeiro since ABIO started the “Feirinha da Saúde” in 1985 at Nova Friburgo. The first farmers market in Rio de Janeiro was created in 1994, the “Feira Cultural e Orgânica da Gloria”, in jointly collaboration of ABIO and COONATURA. In 1996 supermarkets from Rio de Janeiro have started to commercialize organic products (Fonseca M. , 2009b); however for 16 years, since 1994, the metropolitan area of Rio de Janeiro had only the Gloria farmers market (Fonseca, Ribeiro, Siqueira, Machado, Silva, & Assis, 2011).

By 2000 four major channels were used by organic farmers: industries of processing and distribution which were responsible for 70% of the total volume of sales of organic products, followed by CEASA with a limited amount of products because the price did not represent an extra benefit to the farmer. Supermarkets from Rio de Janeiro and regional stores were also responsible for the commercialization of a few products but with a very small amount of sales due to very high prices at final sale points. Organic farmers markets as: Gloria in Rio de Janeiro, one in Niterói, and three more in the Mountain Region were also places where organic products were commercialized but with just a few stands of organic products (Campos, 2001).

A research conducted in 2009 by the FAPERJ project found 19 farmers markets which commercialized organic products; four of those were organized by ABIO: 1 in Rio de Janeiro, 2 in Niterói and 1 in Nova Friburgo (Fonseca, Almeida, Colnago, & Silva, 2009a).

Even though the Southeastern region was the second major region participating on Food Purchase Program (PAA), a governmental program which buys products from family farmers and overpay up to 30% for organic products. In the period that goes from 2003 to 2007 the State of Rio de Janeiro has signed only three contracts with PAA, all in 2007. By the end of 2008, 10 farmers from Petrópolis (ABIO members) signed another contract with PAA to supply organic food for the State in 2009. Finally, in interviews made from 2008 and 2009 were analyzed the so called indirect sales model in 13 distribution industries to characterize their role in the commercialization of organic products (Fonseca M. , 2009b). In the same period, a research in Nova Friburgo mentioned that, from 10 ABIO members, 80% of them were selling their products along one to five commercialization channels which named by the final sale point are: Rede Hortifruti, industries of processing and distribution linked to ABIO, home delivery baskets ,3 farmers markets and 2 specialize stores. The two last channels were exploited by just one organic farmer. The commercialization of organic products was also maintained by other organic farmers with “Feira da Gloria”, home delivery baskets, restaurants from Búzios and with the local CEASA (Pereira & Martins, 2009). This tells us that in 2009 the major existing models were: farmers markets, followed by distribution industry, supermarkets and specialized stores, home delivery baskets, Institutional markets (PAA) and CEASA. This demonstrates the expansion in the scope of commercialization channels to: 7 final sale points.

As a result of discussions done within CPOrg-RJ, in 2009 ABIO had participated on 12 farmers markets promoted by the Municipal Secretariat of Culture from Rio de Janeiro. From these events, ABIO presented a proposal that was approved a year after (in May, 2010), which created the Carioca Circuit of Organic Farmers Markets “Circuito Carioca de Feiras Orgânicas - CCFO”, a legal term for implementing organic farmers markets along the city of Rio de Janeiro, with the compromise that, every fair should have the approval of the Resident Association as well as the Special Secretariat of Solidary Economic Development of the Rio de Janeiro Prefecture (SEDES) consent prior its establishment (Fonseca, Ribeiro, Siqueira, Machado, Silva, & Assis, 2011). This fact has greatly increased the possibilities of commercialization in Rio de Janeiro, the last affirmation was confirmed by the Brazilian Institute for Customer Protection - IDEC (by its Portuguese acronym). IDEC carried out a study which shows that the State of Rio de Janeiro is occupying the third best score on farmers markets, with 15 of them, behind Brasília with 18, and Recife with 17 sale points (IDEC, 2012). The farmers markets were approved in the period were ABIO got its accreditation as OPAC by MAPA and started to move from local certifier to its former and original role of Farmers Association, whose vision is to make possible the maintenance and expansion of organic production in the State of Rio de Janeiro (Feres, 2010).

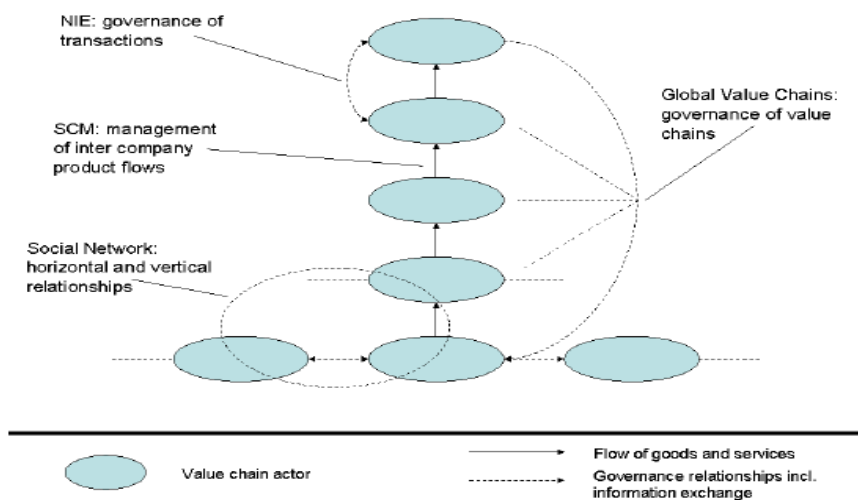
### **C. Organic Value chain – A methodology to understand organic agricultural businesses.**

Rio+20, institutional markets and coming mega-events are current opportunities for organic agriculture, which in five farmers markets managed by ABIO is reaching R\$ 2.5 million annually (Fonseca, Ribeiro, Siqueira, Machado, Silva, & Assis, 2011); the margins are even greater in

supermarkets which registered R\$ 1.12 billion in sales on 2011 with an 8% increase over the last year (BIO BRAZIL FAIR 2012, 2012).

However, despite the global facts, the growth rate of the Brazilian organic production has been limited by problems such as: products supply, market organization as well as production planning (MAPA, 2007; Fonseca, Ribeiro, Siqueira, Machado, Silva, & Assis, 2011; Fonseca, Almeida, Colnago, & Silva, 2009a) In this context, organization and planning are very powerful tools for family farming and organic agriculture that may be used to access: governmental programs, new markets or support organizations by farmers in order to improve their managerial capacity and their income (Caporal, 2009; Torrico, Mino, Barreiro, Friederich, & Barbosa, 2006; Campos, 2001), but they have been not yet enough boosted among organic production stakeholders. This is the main reason to set a practical approach of the value chain of organic products in our targeted municipalities, and provide this planning tool as part of organic agricultural development of the region.

There is currently a flourishing research on value chains which has been increasing in the last decades. Nowadays we can identify four mainstream theoretical approaches to this matter (**Figure 4**): (1) Global value chain analysis is based on the concept of the “lead firms” and investigates multinational companies through identification of the asymmetry of information and power relationships with its counterparts; (2) The social network theory which focuses on the socio-economical relationships among different levels of chain operators; (3) the supply chain management studies that describe the flow of products and services and (4) the new institutional economics which focuses in the role of governance on the transactions made along the chain (Trienekens, 2011).



**Figure 4. Perspectives of theoretical streams on inter-company relationships**

Source: Trienekens (2011)

A value chain is formed by all actors involved in: production, processing, commercialization, and sell of a specific product (Van Elzakker & Eyhorn, 2010). It describes the sequence of related business activities (functions) from the provision of specific inputs for a particular product to primary production, transformation, marketing, and up to the final sale of particular products to consumers (GTZ, 2007). In any case, it will consider the full length of actions required to deliver to the customer a service and/or product, describing the number of links existing and the activities within each link that add value to the final product (Kaplinsky & Morris, 2002).

Therefore a value chain is a supply chain, with the difference that a supply chain implies the perspective of a buyer that stock up raw material, meanwhile a value chain emphasizes the add value that is incorporated in each step and, the collaboration among chain value actors. (IFOAM, 2010). The value chain is not an end by itself, but a source of information for private and public entities. The private entities can use the results to upgrade their strategy or the links which are related with its work field, while public agencies can set planning policies or promotion projects to support the stakeholders (GTZ, 2007). “Every enterprise or public agency working towards making value chains more competitive has to understand how it functions and learn from its failures” (GTZ, 2007, p. 2).

The value chain can explain the dynamic process between iterative activities and incomes, by visualizing the sequence of events, adding values on the functions taken. “The value of this mapping exercise should not be underestimated, because no other form of analysis provides this synoptic overview of earnings in globally linked activities” (Kaplinsky & Morris, 2002, p. 41).

The actors involved in a value chain share a common interest in their business because changes affect them collectively and simultaneously. Thereby, the criterion for value chain analysis has to consider the scope of the value chain defining boundaries for study actions, in order to facilitate promotion or upgrading development actions which would be taken based on the analysis. In the process of shaping a value chain the first consideration will be determine the level of aggregation; it is the decision to take one product, a category of products or an entire sub sector as a study field which will depend on time, availability of resources as well in-depth knowledge about the study area. Two internationally recognized systems of product classification, provided by the UN Statistics Division: “Central Product Classification” (CPC) and the “Standard International Trade Classification” (SITC) may help identifying the field of study. (GTZ, 2007).

The aggregation or disaggregation of products generates alternatives that can be compared in terms of their attractiveness for private and public investment. Besides the significance of market studies for value chain selection, identifying the market potential and specific market opportunities are basic tasks in every market-oriented development approach (GTZ, 2007):

- *To assess the growth potential when selecting a value chain for promotion*
- *To identify market opportunities and formulate an upgrading vision and objectives*
- *To design support action in line with demand conditions*

Chain mapping is the core of the value chain analysis, it simplifies complexity of economical interactions and provides visualization of the business in a way that is understandable for all its members. To start the value chain mapping we should identify the key elements related to the chain, as well as the existence of different levels of value mapping (**Figure 5**). According to GTZ (2007) the first step is to visualize a drawing map where we can easily identify an overview of the entire value chain, this map should present:

- *The sequence of production and marketing functions (in hollow arrows)*
- *The value chain operators who take place in these functions (boxes)*
- *The vertical business links between operators (arrows)*

For tuning up the value chain, we shall keep the marketing functions while the values are attached to the figures, describing the interactions within functions (GTZ, 2007).

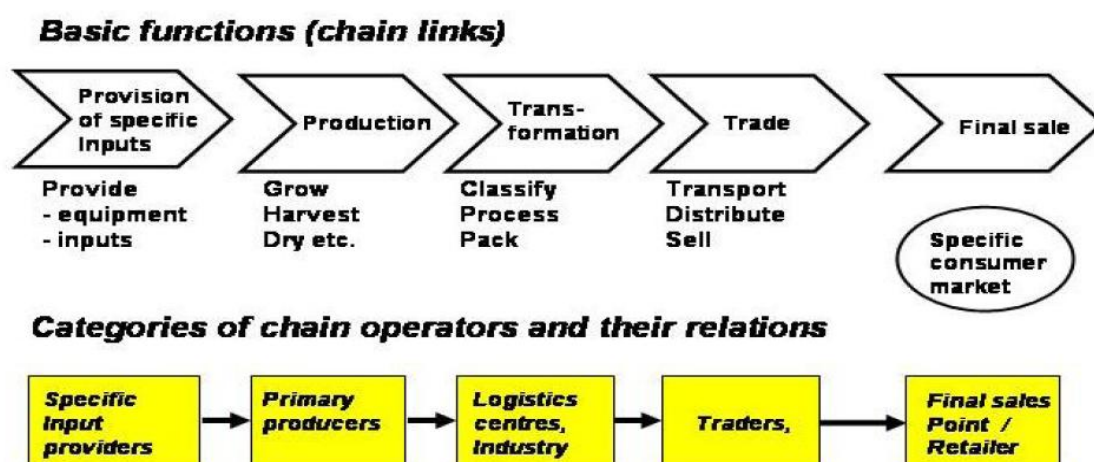


Figure 5. The concept of: Generic elements of a basic linear value chain map

Source: GTZ (2007)

Nonetheless, chain mapping may look very different depending on the “scale” at we are looking the enterprise, and chain mapping can be very different depending on the sector that we want to map: products or services (GTZ, 2007). Particularly in middle level enterprises the value chain may feed many others as we get to the final market or product (Kaplinsky & Morris, 2002). Therefore, we need to have a suitable starting point to retrieve the best outcomes of our approximation to the value chain under study; in **Table 2** we can find an analysis for entrance points to agricultural value chains; as the organic agriculture is our main concern we narrow down the approach to the path that better suits our interest.

Table 2. Some examples of different points of entry into value chain research, the agricultural value chains

Primary area of research interest	Point of entry	What to map	Examples
Agricultural producers	Farms	Forwards to processors, buyers and their customers, backwards to input suppliers	Fresh vegetables to salad packers and category buyers in final markets
Small firms and farms	Small farms, industrial SMEs	Buyers in a range of value chains, input suppliers	Handicraft suppliers to exporters, small farms to processing plants

Source: modified from Kaplinsky & Morris (2002)

The value chain analysis is giving information about the state of the value chain, showing us the indicators to assess the degree of development and diversification of the value chain and, acting at the same time as a monitoring tool for promotion and upgrading of the value chain (GTZ, 2007). These indicators vary based on the type of analysis made and the information required. After all “Drawing a chain map is an “art” rather than a rigorous methodology” (GTZ, 2007, p. 5).

An important outcome of value chain analysis is the upgrading strategies, which are the improvements that can be achieved by private entities and their association in order to propel better situations in the existing value chain. This strategy starts by taking the perspective of the actors: enterprises, producers, public agencies and others. Nonetheless, public agencies have to be

able to facilitate the process of upgrading, otherwise does not take any sense to include them in the analysis (GTZ, 2007). After upgrading comes promotion. This regards to public agencies and NGOs with an active participation in the value chain environment which can provide facilitation to foster chain upgrading. However the promotion strategy “should take place if the vision and strategy are of particular interest to development agencies”. Public agencies as well as NGOs are entities that are involved on different simultaneous activities; therefore, value chain actors should clearly understand that their participation will be temporary in order to promote a specific path where their visions converge.

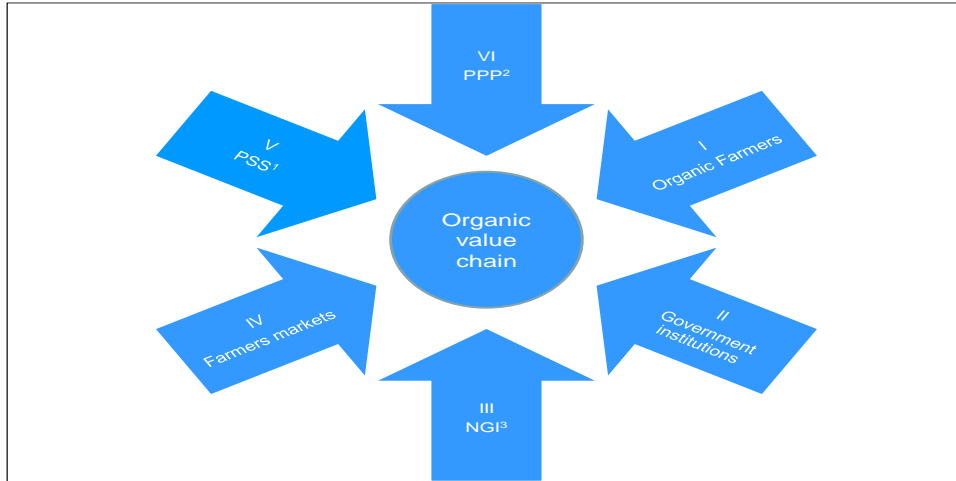
In this context, our approach to characterize the value chains comes mainly from the global value chain perspective, because it analyses all organic entrepreneurs rooted in the municipalities under study. The research takes the State of Rio de Janeiro as the global scenario, considering Cachoeiras de Macacú, Nova Friburgo and the city of Rio de Janeiro as focal points, where the commercialization takes place. This has offered an overview of the leading market models currently working on these geographical segments, as well as a perception analysis of weaknesses and strengths pointed out by all stakeholders involved on the aggregated value chains of organic products, pointing out at the same time the opportunities and threatens faced by these farmers to access those value chains. The analysis does not show governance relationships, but provides an insight over the role that could be addressed by different actors in the future; highlighting the role of farmers and institutions and possible strategies for upgrading and promotion of the existing value chains based on several indicators discussed in the results.

## VI. Methodology

### A. Sampling

The stakeholders analysis was at first based on secondary data collected from previous works done in the area of influence, for this approach were very important the papers done by: Posdena, Jansens, & Torrico (2009); Fonseca M. (2005); Peixoto, Neves, Guerra, & Almeida (2008); as well as internet web sites of Governmental Public Institutions as MAPA, and local entities as ABIO. Based on a multi-criteria examination, we found six main stakeholders that play an essential role into the value chain of organic products from Cachoeiras de Macacu and Nova Friburgo (**Graphic 3**): Organic Farmers, Farmers Markets, Permanent Stores and Supermarkets (PSS), Government Institutions, Non-Governmental Institutions (NGI are represented by Participatory Conformity Assessment Bodies and Private Industries of Processing and Distribution), and Institutions of Public Private Partnership (PPP).





**Graphic 3. Organic Value chain stakeholders from Cachoeiras de Macacu and Nova Friburgo.**

<sup>1</sup>Permanent Stores and Supermarkets; <sup>2</sup>Institutions of Public Private Partnership; <sup>3</sup>Non-Governmental Institutions

The next step was identify, the number of stakeholders that would shape our universe on the analysis of the value chains of organic products. In this regard, we have predicted a census from the stakeholders (**Chart 2**), based on the data collected which suggested that organic agriculture was restricted to a limited number of farmers in this two municipalities.

**Chart 2. Stakeholders currently participating on the organic value chain of Cachoeiras de Macacu (CM) and Nova Friburgo (NF).**

Stakeholders	Area of Study	Predicted	Field observation	Interviewed	Percentage	Timing
organic farmers	Cachoeiras de Macacu	6	7	7	100	two months
	Nova Friburgo	8	7	6	85	
Farmers markets	Cachoeiras de Macacu	0	0	0	77	one and a half weeks
	Nova Friburgo	0	1	1		
	Rio de Janeiro	4	8	6		
Permanent Stores and Supermarkets (PSS)	Cachoeiras de Macacu	0	0	0	67	one week
	Nova Friburgo	2	8	5		
	Rio de Janeiro	0	1	1		
Government Institutions	EMATER CM-NF	0	2	2	75	one month
	MAPA-CPOrg-RJ <sup>1</sup>	1	1	0		
	SFA-RJ	1	1	0		
	PESAGRO	0	1	1		
	Prefeitura CM	1	1	1		
	Prefeitura NF	1	1	1		
	EMBRAPA Agrobiología	0	1	1		
Institutions of Public Private Partnership (PPP)	SEBRAE-NF	0	1	1	33.3	one week
	SEBRAE-RJ	1	1	0		
	ECOCERT	0	0	0		
	IBD	0	1	0		
Non-Governmental Institutions (NGI)	Sítio do Moinho	0	1	1	100	one week
	SPG ABIO: CM-NF	0	1	1		
	ABIO RJ	1	1	1		
	Horta Organica	1	0	0		
	AGROPRACTA	1	0	0		
total		28	46	36	76.8	Three months

<sup>1</sup>Coordination of CPOrg-RJ

Once in the field, a new adjustment was made based on geographical parameters and the analysis of the leading firm, in this case, taking ABIO's cadastre as a tool for decision making, we have identified all Organic Farmers available in the municipalities under study; which together with the information collected throughout meetings with key stakeholders have helped us to systematize the most important actors in the development of the value chain from Cachoeiras de Macacu and Nova Friburgo. The research embraced almost 80% of stakeholders, which are currently related with organic agricultural activities that occur in these two municipalities. The research took place in three months, starting at the end of February 2012. **Chart 2** also shows the average time required for interviewing each group of stakeholders.

## B. Semi-structured interviews

To collect information of the stakeholders, related with organic value chains; we had developed a semi-structured interview addressing the main stakeholder groups. This interview point out several common topics for all stakeholders, and prioritize particular points in the case of focal groups as governmental institutions or farmers markets who can provide more information about other matters, as programs and projects to foster organic agriculture (**Annexes 3, 4, 5, 6**).

**Table 3. Key elements of market research on value links.**

1	Is there a market and how can it be characterized?
	Types of products in demand (e.g. varieties and seasonality as well as product quality and packaging as preferred by the processing industry and/or final consumers.
	Market size and trends (e.g. volumes traded, consumption of different consumer groups)
	Seasonality of market supplies (e.g. periods of cover -and- undersupply), demand peaks
	Product prices (e.g. maximum & minimum prices, price trends, fluctuations, price range)
	Requirements of buyers in terms of quality, price, volume and reliability
2	Who are the competitors and how do they perform?
	Competing producers / value chains (e.g. imports, supplies from other regions)
	Performance of competing market participants (e.g. price quality, market shares)
	Competitive advantages of competitors (e.g. market distance)
	Competing products (e.g. products used as substitutes)
3	What are the conditions of market access?
	Existing distribution channels (e.g. industry, export or end consumer markets)
	Power market participants (e.g. monopolies)
	Infrastructure of roads and market places (e.g. rural/urban, markets, storage facilities)
	Product standards (e.g. laws / regulations on product safety, labeling or packaging)
	Tax and tariff regimes (e.g. customs tariffs on inputs, levels on road transport)
	Service offers facilitating market access (e.g. financial and information services)

Source: modified from GTZ (2007)

The interviews were based on the key elements provided by GTZ (2007); as is shown in **Table 3**. After a first draft, a series of meetings with experts were made in order to sort out the aspects that could improve the accuracy of the interview as well as the structure of the questions. This will allow a more specific answer from the respondent as well as a better discussion on the matter assessed. Finally, once in the field, three key representatives were contacted, two representatives of

Government Institutions and one of Organic Farmers. They helped to assess the questions of the interviews as well as for to propose new questions, which can better fit the reality of the municipalities under study.

The interviews were designed for: Organic farm Owners (I); sales responsible in the case of PSS or managers in the case of Farmers Markets (II, III), the chief of the Agricultural Sector in the case of Municipalities, PESAGRO and EMBRAPA, and the staff responsible for Agroecological Agriculture in the case of EMATER as well as the responsible for organic agriculture and commercialization in the case of SEBRAE (IV, VI). Finally, the interviews were applied to the ABIO-director and representatives of Sítio do Moinho (V). The investigation could not include representatives of: CPOrg-RJ coordination, SEBRAE-RJ, IBD and MAPA/SFA-RJ because of the short time or the impossibility to schedule an appointment (**Chart 3**).

### 1. Value chain analysis

Value chain analysis is often made for a particular product. However, in order to get a broader analysis and characterize the increasing variety of organic products and final sale points where Organic Farmers from the municipalities under study commercialize their products, the research has analyzed key factors for understanding the whole process of production and trade in Cachoeiras de Macacu (CM) and Nova Friburgo (NF), see **Figure 6**.

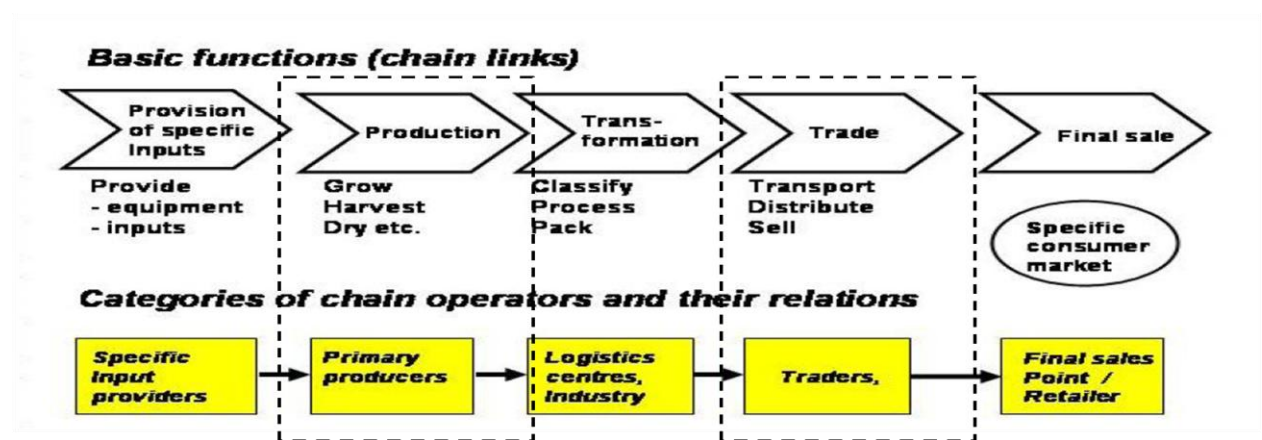


Figure 6. Scope of the research done at Cachoeiras de Macacu and Nova Friburgo.

Source: modified from GTZ (2007)

We are presenting in this research a detailed explanation of the market characteristics from organic farmers markets (one of the three main final sale points), due to the interest showed by farmers from both municipalities. They provided weekly information of commercialization and production from 2011 and in some cases up to 2012, which made possible the estimation of a year period of commercialization. At the same time, institutions as Sítio do Moinho have allowed us to have their information of purchases made to farmers from CM which has increased the scope of our analysis.

Due to the importance of the weekly variation in the farmers markets and as it was requested by organic farmers, the investigation shows compiled information of weekly sale expectations of NF at

organic farmers markets. Also, the variation on weekly basis of the production commercialized by farmers from CM on 2011 with the purpose to provide enough information for upgrade of value chains, and as a tool for promotion, which can be used as a base line research for public institutions.

## **2. Strengths, Weaknesses, Opportunities and Threats (SWOT) technique**

The questions were classified into positive and negative aspects and later disaggregated into strengths, weaknesses, opportunities and threats. Even when the methodology recommends establishing group meetings to discuss the importance or not of SWOT parameters, the time available to practice the required interviews was enough only to perform them individually at the farms or the offices of the other stakeholders involved in the value chains.

The questions were asked with a range of importance from nine, if the issue had an important magnitude or it was very notorious for the stakeholder; to zero, when the issue did not represent a barrier for commercialization development. The stakeholders were asked to place a value 9 for positive issues (as the top of the scale), which were characterized as the most important, the most helpful or indisputable factor to improve commercialization and the value 0 for those that do not have any importance.

For negative issues the scale was inverted. The stakeholders were asked to put a value 9 for negative issues (as the top of the scale), which were considered the biggest obstacle or have caused more damage for commercialization of organic products and the value 0 for those which do not represent an obstacle for commercialization. Although the questions were addressed exclusively to commercialization, farmers and other stakeholders have mentioned other aspects which were considered essentials for the development of organic value chains as a whole, those aspects are considered in the results section.

## **C. Data collection and Interviewing**

After consultation with experts and major stakeholder representatives we have identified the major stakeholders and delineated the questions for each group (**Chart 3**): (I) Organic Farmers, (II) Farmers Markets, (III) PSS, (IV) Government Institutions, (V) NGI and (VI) PPP. Interviews were done following the same pattern, asking the stakeholders at first, for an answer about their knowledge on the pre-established questions. In a second step, when the stakeholders had ended their speech; we suggested several possible answers to the items (**Annexes 3, 4, 5, 6**) in order to collect the ideas provided by experts and major stakeholder representatives. That made possible the enhancement of issues analyzed, because each stakeholder had added their own opinion to the general suggestions. Finally, there was made an average among all the interviewees' answers to weight the final punctuation.

The questions have addressed aspects as: the role of public policies in organic agriculture and the knowledge of any program or project available in the municipalities. Those aspects have been easily

identified by the name of the institution, project or program which works in this field; thereby we are also presenting the average of importance given to them in the results section.

**Chart 3. Questions addressed by the research, by the corresponding group of stakeholders.**

I*	IV, VI	II, III	V	Questions addressed on the interviews
5	1	4	1	What are the positive points faced by organic farmers to access the organic value chain? (opportunities and strengths)
6	2	5	2	Which are the negative points faced by organic farmers to access the organic value chain? (weaknesses and threats)
7	3		3	Which is the role of public policies in organic agriculture? Do you know any program or project addressing organic agriculture?
8		1		What are the characteristics of the organic products that are mostly traded in the regional and local market and what are the reasons for being the most exchanged?
1				Which are the crops names, date and seasonality of planting?
2				Which are the crops names, date, seasonality of harvest and price?
3				How long have you been an organic farmer, why did you choose this profession?
4				What are the criteria to be selected as organic farmer at MAPA?
9				How is your relationship with other value chain actors; sales are direct or indirect?
10				What is/are your scope(s) for organic production?
	4		4	Which institutions are currently offering support for organic agriculture in the region?
	5		5	Do you know the conformity assessment mechanisms? How do they work in the region? (types)
			6	What are the benefits for each conformity assessment mechanism?
		2		Can you tell the most traded products names and where do they come from?
		3		What is the type of conformity assessment mechanism that the farmer have? - How long have you been selling his(her) products?
		6		What are the sales strategy used?
		7		What is the strategy of organic products purchase?
		8		Is the farmer who delivers the products?
	7	9	7	Do you have any other aspects to be considered?
	5			How do you estimate the area which is being used for organic agriculture?
	6			Which institutions help or hindered the participation process of organic agriculture?

\*Stakeholder groups: I, Organic Farmers; II, Farmers Markets; III, Permanent Stores and Supermarkets; IV, Government Institutions; V, Non-governmental institutions and VI, Institutions of Public Private Partnership; # Numbers represent the question sequence addressed at each group of stakeholders

During the interviews some questions did not have a specific answer related to the value required; in this case we used the following scale to measure the importance of the issue addressed by the stakeholder (**Chart 4**). Most interviews were recorded with previous consultation; to facilitate data accuracy and analysis.

**Chart 4. Pool of phrases considered to put values on the stakeholder answers.**

Value	Positive	Negative
0	Do not mentioned	
1	I know it exist but I do not do it	There is not problem
	I have heard...	Here we do not feel that
3	The matter is mentioned	
	The importance is minimum	There is not much problem with...
5	More or less	Nowadays there is not problem.
	We attempt to ...	Can be problematic
7	it was helpful, but not anymore	
	It is important	generates problems
9	It helps	It is a problem
	Indisputable	
	Very important	Very problematic
	Without it there is nothing	

The weekly values for farmers markets without production estimations were obtained by adding all weekly values of 2011 and dividing them by the number of appearances at farmers markets. This was done for each product and the results show the most sold products on weight basis of 2011. Seasonal products such as stationary fruit production are also divided (**Graphics 14 and 16**).

The current production of NF was estimated by dividing the total number of items brought to farmers markets throughout 2011 by the maximum number of assistance of Organic Farmers at farmers markets in 2011. Seasonal products such as stationary fruit production are also divided but, they do not show the line that the estimated ones have (**Graphic 15**).

## **VII. Results**

### **A. Characterization of the current global value chains of organic products present at the municipalities under study, basic map.**

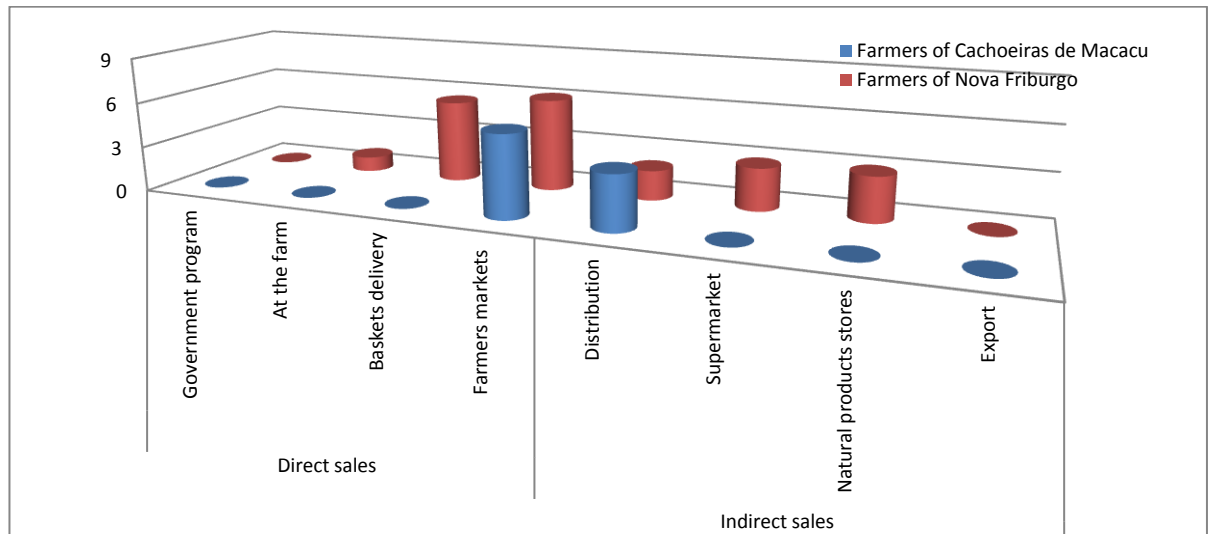
#### **1. Types of value chains present on the municipalities under study**

The research has considered four value chains for direct selling and four types for indirect selling (**Graphic 4**). Six of which have been used by organic farmers from the municipalities under study. Farmers from Nova Friburgo (NF) have occasional sales through companies which distribute their products to another source as well as occasional sales directly at the farm. The four main value chains, named by the final sale point are: home delivery baskets which are constantly delivered at NF, but occasionally taken to farmers markets from the Carioca Circuit of Organic Farmers Markets (CCFO) as delivery points for especial consumers in Rio de Janeiro. Farmers markets: of CCFO and conventional markets are also a regular value chain; five farmers markets of CCFO are supplied by this way and two conventional farmers markets that have one stand of organic products. Supermarkets and specialized stores are considered as one value chain because even when they have differences among value share, they are managed by the same farmer.

Organic farmers from NF perceived that home delivery baskets and farmers markets are the most important value chains. Home delivery baskets because it is a promising chain and supermarkets and specialized stores due to the holding time provided by this value chain.

In Cachoeiras de Macacu (CM) there are two main value chains: farmers markets of organic products that end at the CCFO or “Orgânicos para Todos”, and one Industry of processing and commercialization (Sítio do Moinho) that distributes organic products among restaurants, hotels, supermarkets and own stores in Rio de Janeiro. Farmers markets are used occasionally as meeting point for special orders of home delivery baskets. The other buyer, which serves as trader among its final sale points, is an industry which is based on Petrópolis. This industry acts as a collector of organic products from other municipalities to supply itself with a continuous offer. The products collected from CM are processed in Petrópolis and afterwards can go through any of the above

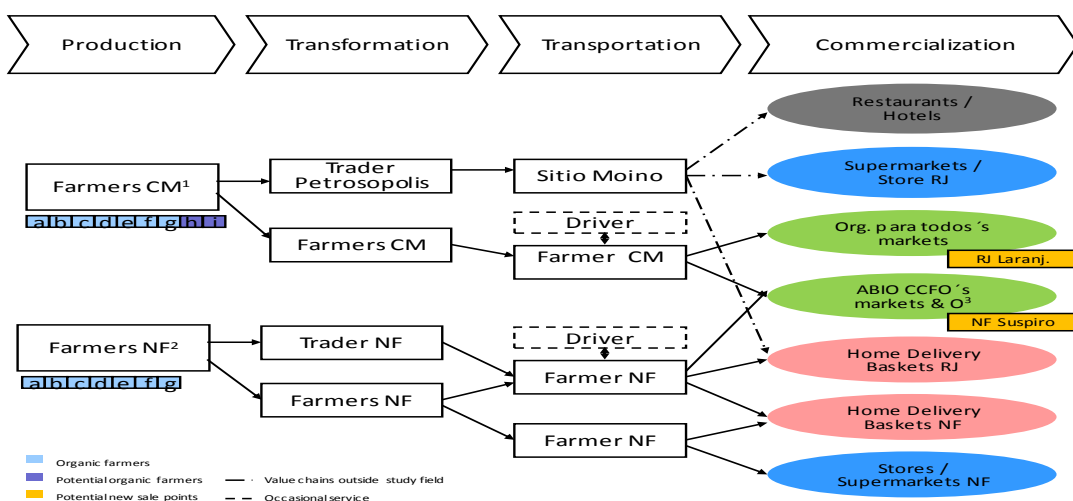
mentioned value chains. Organic farmers from CM are part of the network of farmers which supply Sítio do Moinho.



Graphic 4. Types of value chains and its importance perceived by organic farmers from the municipalities under study.

Organic farmers from CM perceived that farmers markets are the most important value chain due to this chain represents a short term recovery channel of their investment even though the volume commercialized through this value chain is smaller than the volume commercialized through Sítio do Moinho which offers bigger purchases but longer investment recovery period.

In Rio de Janeiro, the amount of organic products sold is increasing as well the number of commercialization points. Thereby, in an environment that used to have a limited quantity of value chains; we may find nowadays a substantial increase not just in the traditional value chains (supermarkets and farmers markets) but also in other promising opportunities.



Graphic 5. Global characterization of value chains of organic products; basic approach to the municipalities under study.

<sup>1</sup>Cachoeiras de Macacu; <sup>2</sup>Nova Friburgo; <sup>3</sup>Carioca Circuit of Organic Farmers Markets & conventional farmers markets where organic farmers sale their products

The value chains have substantially diversified its sale points in the two Municipalities under study, and they currently interact direct or indirectly in four major models of value chains. Home delivery baskets which are supplied usually at customers' homes; however they are also distributed through supermarkets and specialized stores as baskets collection points. Supermarkets and Specialized Stores are the strongest markets, yet they require a more regular, organized and uniform supply even though their prices are lower. Farmers markets stand as the best direct ways of commercialization, nonetheless the organization required and the continuity demanded can be a challenge for farmers, who are not ready to have an associative value chain. Finally restaurants and hotels are interesting clients that increment their acquisitions with expectations towards coming international events, tourism activities and other related activities in the region. Organic agriculture in Rio de Janeiro is generally propelled by "neorurais", farmers who can afford seals of the Brazilian Organic Conformity Assessment System (SisOrg) but are not directly dependent on this activity. Nonetheless new opportunities for family farmers are arising with the regulations of the Law of Organic Production which together with the state regulations can contribute to the spread of organic agriculture. At the municipalities under study, this is reflected on the enhancement of value chains and sale points within a value chain as we can see in **Graphic 5**.

Most of the products traded along the different value chains are vegetables and legumes but, as we will see in the next graphics; this parameter is heavily dependent of: the type of weather, seasonality and farm scale of the production centers. Those factors make CM a greater producer of fruits than NF which has a large amount of vegetables and legumes with a little amount of fruits. The group organization will also have great importance over the chosen channels to commercialize organic products (**Charts 5 and 6**).

## **2. Current value chains of organic products in Cachoeiras de Macacu and its importance for organic farmers, thematic mapping.**

Cachoeiras de Macacu supplies products to four value chains following two specific commercialization channels. They have commercialized, from the total weight produced in 2011; 34% of fruits and 66% of vegetables and legumes.

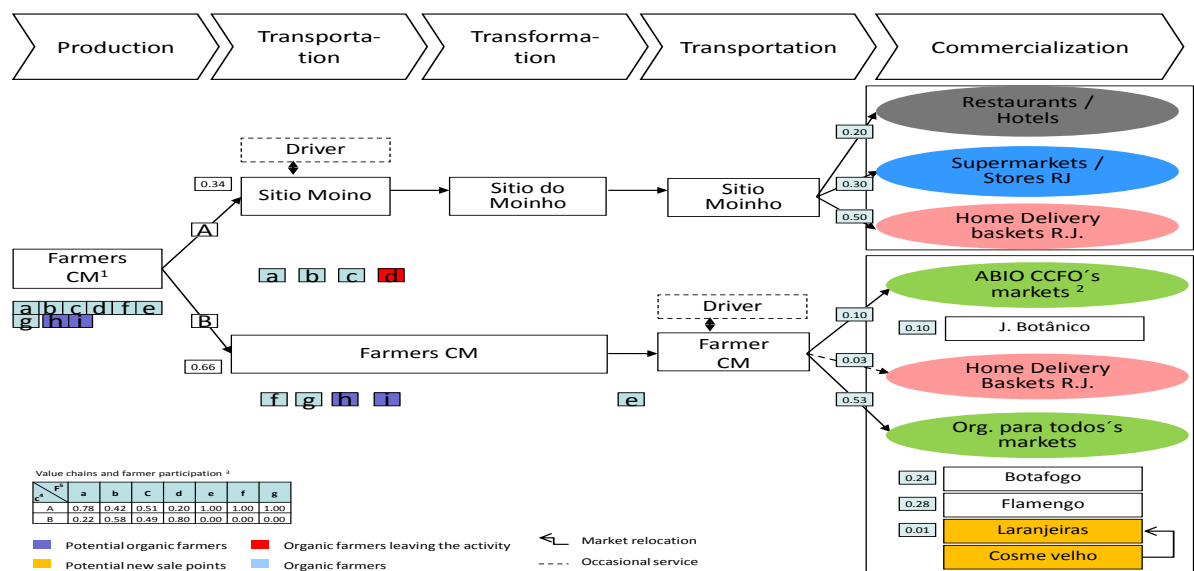
Organic farmers from CM have in average 39% of their land under production; with a maximum of 104 products distributed along its final sale points. They supply products for Farmers markets, Sítio do Moinho and home delivery baskets. Four farmers share their production among the three value chains, while three farmers commercialized their products just with organic farmers markets and home delivery baskets (**Annex 7**, list of sold products by each value chain).

There are seven organic farmers in CM accredited by the Biological Farmers Association of the State of Rio de Janeiro (ABIO), and within them three accredited by the Brazilian Agricultural and Food Inspections and Certifications service (IBD) and one by the Inspection and Certification Body for Sustainable Development (ECOCERT). 66% of their production goes to farmers markets, either to the Carioca Circuit of Organic farmers Markets (CCFO) with 10 % or "Orgânicos para Todos" with 53%; both of them located in the neighborhoods of Rio de Janeiro city. At these sale points farmers also provide a service of home delivery baskets (3%) that accounts for the rest of the sales. Two other



farmers are starting to commercialize their products through these channels; they are family farmers who cannot afford the accreditation costs for accreditation bodies and are covered by the ones that already have it. The mechanism of commercialization requires that all farmers bring their products to a single farm where one farmer prepares the products for the sale at farmers markets and from where the products are transported to the final sale points at organic farmers markets. The dotted line in **Graphic 6** shows that, sometimes they require a driver; which increases the costs of production in a considerable manner.

“Orgânicos para Todos” is a branch of organic farmers (mainly accredited by ABIO), who commercialize their products in other points than the CCFO, taking advantage of the approval of the providence reached between ABIO and the Municipality of Rio de Janeiro which enables the establishment of organic farmers markets prior agreement with: the Special Secretariat of Solidary Economic Development of the Rio de Janeiro Prefecture (SEDES) and Resident Associations of Rio de Janeiro city.



**Graphic 6. Characterization of existing value chains from Cachoeiras de Macacu.**

<sup>1</sup>Cachoeiras de Macacu; <sup>2</sup>Carioca Circuit of Organic Farmers Markets; <sup>3</sup>Proportion of farmers participation on each value chain; <sup>4</sup>Value Chain; <sup>5</sup>Organic farmers

Sítio do Moinho is a private institution, an Industry of processing and distribution, as is described in Campos (2001) and it is generating commercialization links with farmers from CM and other municipalities in order to supply its own value chains.

This institution, based in Petrópolis, has three main value chains to sell its products: supermarkets and specialized stores in Rio de Janeiro, home delivery baskets and restaurants and hotels delivery. Four of the farmers from CM are constantly supplying organic products to Sítio do Moinho, reaching in 2011 a 34% of the total production of organic products from CM. This is the leading channel in CM with an increase of the volume sold in the first four months of 2012 of 4.17 times with respect to the previous year (data collected from one organic farmer). Transportation is also a key element in this

value chain because farmers cover this kind of expenses when Sítio do Moinho does not come to pick up the products (**Graphic 6**).

### **3. Current value chains of organic products in Nova Friburgo and its importance for organic farmers, thematic mapping.**

Nova Friburgo (NF) has a longer tradition in organic agriculture (after all it was here where ABIO was created). Therefore, the farmers have a stronger organization that despite the problems to reach particular objectives are able to discuss and coordinate very different issues from those at the ABIO core of CM. This is represented in the amount of sale points used to commercialize organic products. Traditionally NF used to have a weekly farmers market of organic products located in a square of the residential neighborhood of Cônego.

This important sale point was lost last year as a consequence of the landslides catastrophe faced by the city caused by extreme precipitation conditions. This weakness has led the organic farmers to explore new ways of commercialization. Thus, in this study NF has become the leading municipality with the highest number of sale points, and the farmers also show the largest amount of relationships with private or public institutions which ultimately help in the development of the activity.

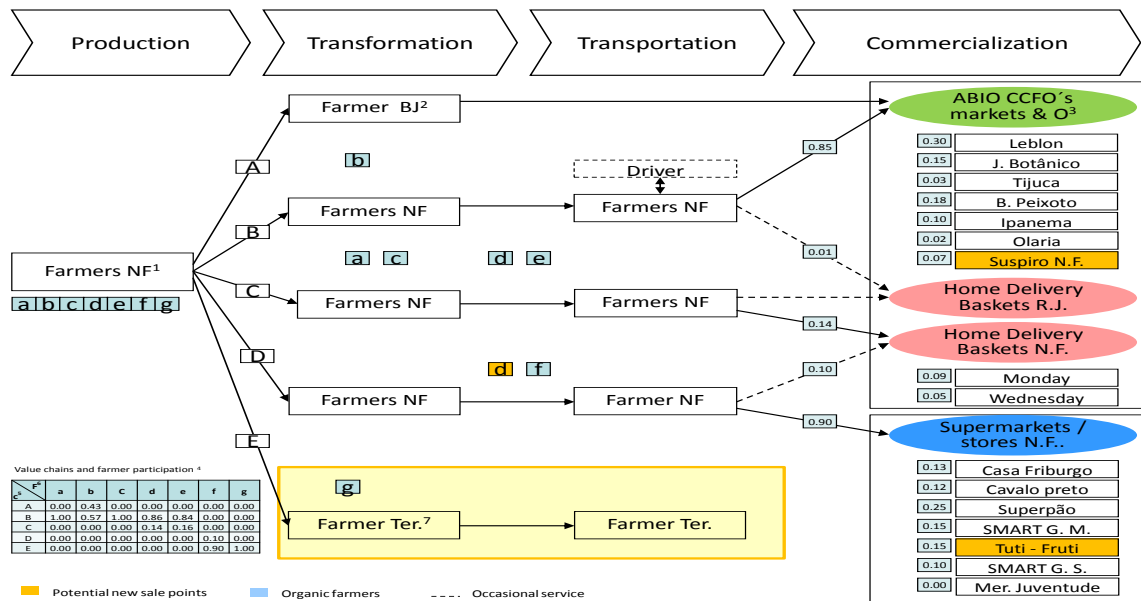
NF supplies organic products to three main value chains which follow five major commercialization paths; moreover they have a very broad spectrum of final sale points, see **Graphic 7**. Organic farmers have commercialized 8.5% of fruits and 91.5% of vegetables and legumes at organic farmers markets on total production weight basis in 2011. In other value chains are vegetables -including eggs- virtually the 100% of the total weight sold. This applies at conventional farmers markets and home delivery baskets (**Annex 7**, list of sold products by each value chain).

Organic farmers from NF have in average 8.2 % of their land with organic production; some of them share organic production with non-organic cattle production. There are 86 products distributed along organic farmers markets, 51 in home delivery baskets and an equal number in conventional farmers markets. NF has seven certified organic farmers accredited by ABIO who commercialized through these value chains; among them two are accredited by IBD and one by the National Institute of Technology (INT).

As we can see in **Graphic 7**, organic farmers from NF provide products to: farmers markets, home delivery baskets and supermarkets and specialized stores. One farmer provides most of its production to NF even though his farm is located in another municipality (Bom Jardim). There are four farmers who are constantly feeding the CCFO but just two of them share their production with home delivery baskets at NF. There is just one farmer who cope the value chain of supermarkets and specialized stores in NF and finally one farmer who commercialized mainly fruits with other municipality (this study does not take into account the production of this last farmer).

The supermarkets and specialized stores of NF are supplied by a single organic farmer who distributes its production across 5 supermarkets and two specialized stores -Mercearia Juventude

and Tuti-Fruti-. However, the last store is developing new opportunities for other organic farmers from the area, to cope the increasing demand of organic products in the city.



**Graphic 7. Characterization of existing value chains from Nova Friburgo.**

<sup>1</sup>Nova Friburgo; <sup>2</sup>Bom Jardim; <sup>3</sup>Carioca Circuit of Organic Farmers Markets & conventional farmers markets where organic farmers sale their products; <sup>4</sup>Proportion of farmers participation on each value chain <sup>5</sup>Value chain; <sup>6</sup>Organic farmers; <sup>7</sup>Teresópolis

Farmers markets are a very important value chain with 7 sale points: 2 at NF into conventional farmers markets and 5 in CCFO in Rio de Janeiro. Farmers markets take 85 % of the total production of the five organic farmers who use this value chain; this is an expanding value chain which shows for one farmer a 4.65 times increase in weight sold comparing the first four months of 2012 with the same months from 2011. They also do home delivery baskets in Rio de Janeiro through this channels; nonetheless now they are exploring possibilities to establish a permanent stand in Rio de Janeiro to facilitate the management of home delivery baskets. Home delivery baskets are also an important chain inside NF; in fact this chain is responsible for 14% of the total sales of organic products from NF among farmers who use this channel in an associative way.

Value chains in NF have a very strong local interaction, with opportunities of reopening a farmers market in the Suspiro square, with which is expected to cover the increasing demand of organic agriculture in the city. At the same time, efforts have been made to incorporate hotels and restaurants as alternative value chains in the municipality.

**B. Brazilian network of institutions, programs and projects potentially available, on the municipalities under study; for organic agriculture.**

Although organic agriculture is considered as a production system based on agroecological principles (Agroecology as a science), as it was recognized by MAPA and all the segments involved in the construction of the Law of Organic Production; there are other political groups that defend

agroecological farming as the correct “philosophical” term for this activity. In this regard the Ministry of Agricultural Development (MDA) has often considered the term “agroecological agriculture” in their actions which are addressed to family farmers.<sup>14</sup> The programs and policies addressed to family farmers, even when promote organic agricultural practices are meant to benefit farmers who obtain most of its income of the agricultural production<sup>15</sup>. However, there are several institutions, programs and projects in Brazil to support organic agriculture. There has been also an increase of fostering institutions in this matter since the approval of the Law of Organic Production - *Lei da Produção Orgânica No 10.831*- along with the implementation of its regulations in subsequent years.

The municipalities under study have a network of institutions working on fostering organic agriculture. Most of them are addressed to agroecological farming; which has a particular connotation on the field as we have explained in the last paragraph. Programs which foster organic farming practices but are addressed to family farmers require the prior approval of tools as the National Program of Family Agriculture Strengthening (PRONAF) and the Declaration of Aptness for PRONAF (DAP) to allow the entry of organic farmers on these programs (the Food Purchase Program -PAA- or the National School Feeding Program -PNAE-). However, these programs do not take into account specific realities of the municipalities under study<sup>16</sup>. Hence, organic farmers in this research are generally not able to receive the benefits of these programs because they do not fill the requirements (they have other income outside agriculture), or do not have the ownership of the land.

Considering the above two paragraphs we will describe in this section the programs, projects and institutions which are promoting organic agriculture or have fostered organic farming practices among family farmers in the municipalities under study. **Graphics 8 and 9** depict the interaction of programs and projects fostered by Government Institutions (enablers); Non-Governmental Institutions (NGI) and Institutions of Public Private Partnership -PPP- (supporters) which have been related with organic agriculture and represent the most important activities in the last years.

In CM the organic agricultural practices have been fostered by programs such as: the Sustainable and Integrated Agroecological Production program (PAIS) and the Growth Acceleration Program (PAC). The first is a jointly collaboration of The Brazilian Service of Assistance to Micro and Small Enterprises with its office on Nova Friburgo (SEBRAE-NF) and the Agricultural Secretariat of CM in the implementation of agroecological practices among family farmers. The second is a federal program focused into institutional development which allows the expansion of technicians’ area of involvement by providing means of transportation and fixed assets to improve technical assistance in the case of the Corporation for Technical Assistance and Rural Extension of Cachoeiras de Macacu (EMATER-CM).

ABIO has been a key part on organic agriculture as Participatory Conformity Assessment Body (OPAC) with the institutionalization of the Participatory Guarantee System (SPG) as core part of the accreditation process, and also with political participation on the approval of the Carioca Circuit of Organic Farmers Markets (CCFO) which offers new sale points. In the same line, Sítio do Moinho has

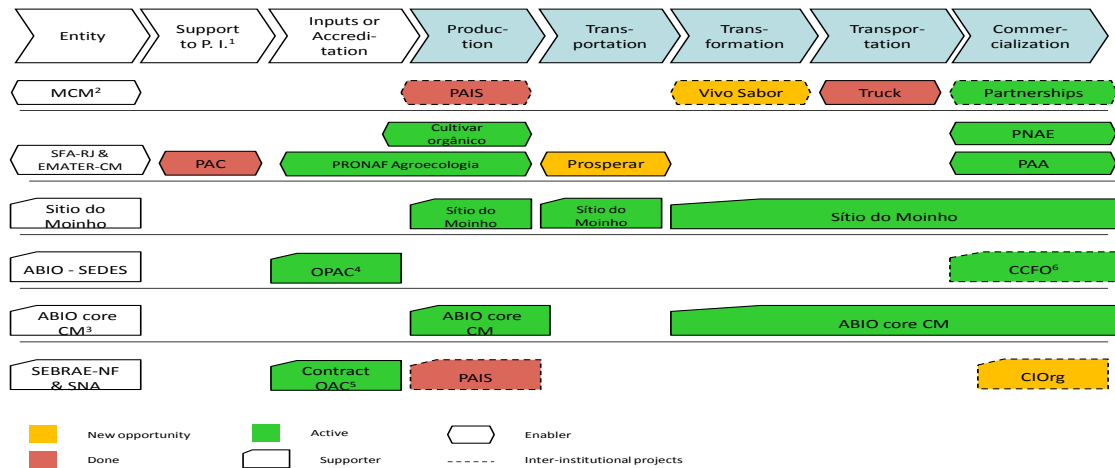
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<sup>14</sup> Based on: Peixoto, R., personal communication, August 6, 2012

<sup>15</sup> More information may be found at: <http://redeagroecologia.cnptia.embrapa.br/biblioteca/agricultura-familiar/CONCEITO%20DE%20AGRICULTURA%20FAM.pdf/view>

<sup>16</sup> Specific information may be found at: Fonseca M. (2009b) and Caporal (2009)

been participating in the value chains of this region, having a great impact on the production of organic products. SEBRAE-NF is also promoting international accreditation with Conformity Assessment Organisms - Certification by Audit (OAC) to increase the pool of organic products for the coming mega-events in Brazil (**Graphic 8**).



**Graphic 8. Interaction of programs and projects which are promoting organic agriculture in Cachoeiras de Macacu; and the representation of value chain enablers and its supporters.**

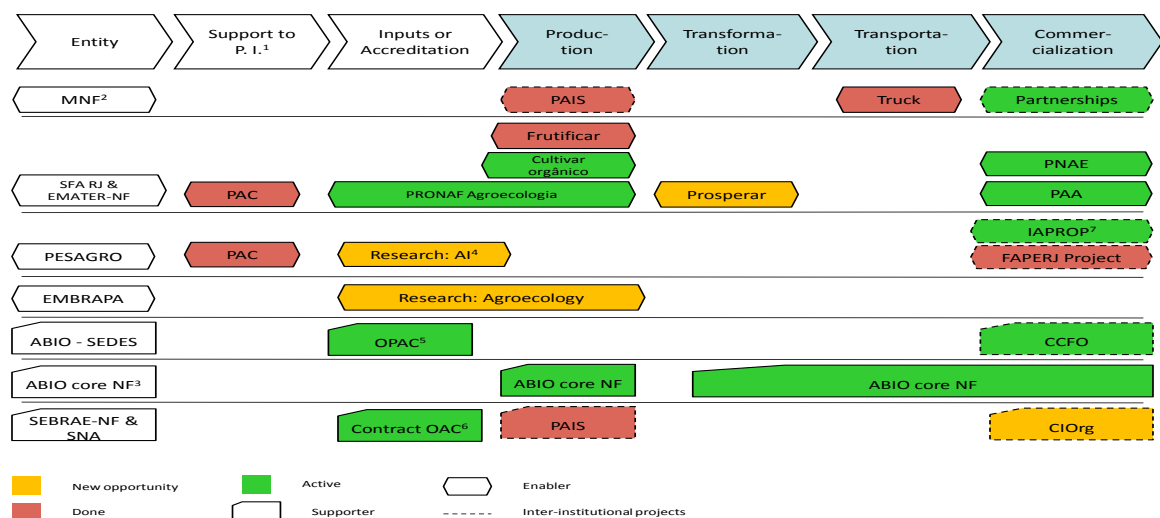
<sup>1</sup> Governmental Support to Public institutions; <sup>2</sup>Municipality of Cachoeiras de Macacu; <sup>3</sup>ABIO core of Participative Guarantee System in Cachoeiras de Macacu; <sup>4</sup>Participatory Conformity Assessment Body – ABIO; <sup>5</sup>Certification by Audit

EMATER-CM may advise and assess the participation of farmers on several policies of credit lines which cover different functions of the value chains. Programs such as: PRONAF Agroecologia which can contribute with financial aid for family farmers. At the same time, PNAE and PAA stand as potential sale points for family farmers with a range of possibilities that may fit organic farmers. However, none of the above programs are being used by organic farmers in this municipality due to the fact that they require DAP as prior requirement to access them, and all farmers from CM have another source of income greater than the agricultural one and those who depend totally on agriculture are sharecroppers, therefore have not ownership of the land they are using. Nonetheless Prosperar, and Cultivar Orgânico are credit line programs which do not require DAP to access them, leaving these programs as the only current possibility of public aid to organic agriculture in CM.

Furthermore, Vivo Sabor, which is a company that provides food services to the Petrochemical Complex of Rio de Janeiro (COMPERJ), is making agreements with the CM City Hall to provide organic products to the COMPERJ. This institution may be a potential partner for organic farmers. SEBRAE-RJ through its office in NF with the National Agricultural Society (SNA) is also implementing a program called Intelligence Center in Organics (CIOrg). CIOrg aims to gather information about organic farmers, their volume of production, quality of production, bottlenecks of production, opportunities for commercialization, among other factors in order to generate a data base which will help farmers to place their production in different niches, broadening their value chains perspectives.

NF has a wider network of institutions involved in organic agriculture. The Agricultural Research Corporation of the State of Rio de Janeiro with its office on Nova Friburgo (PESAGRO-NF) and EMATER-NF have been promoting this activity on the municipality for a long time using the PAC to directly support research and technical assistance on this matter. There was also a jointly communication among these stakeholders on projects as Frutificar and a project funded by FAPERJ in order to consolidate a data base on organic agriculture of the region. PESAGRO-NF is still working in that line aiming to implement and assess public regulations of organic production in the region. Nowadays, EMATER-NF has provided assistance to one organic farmer from this municipality with Prosperar, to upgrade processing in her value chain. As well as in CM, PAA, PNAE, Cultivar Orgânico and PRONAF Agroecología are programs available in NF, however most of them require DAP and farmers from NF cannot have access to them because most of the organic farmers have other sources of income besides agriculture which disqualify them as beneficiaries from those programs; nonetheless two farmers from NF have DAP and could have access to these programs (**Graphic 9**).

ABIO is a reference for organic agriculture in this Municipality which has been reflected on the rapid expansion of sales over CCFO after the landslides catastrophe that left the municipality without its farmers market. The Participatory Guarantee System of this municipality is better consolidated, reaching not just commercialization of organic products but debate and exchange of experiences among different stakeholders, and this ABIO core is closely linked to Government Institutions, PPP and NGI.



**Graphic 9. Interaction of programs and projects which are promoting organic agriculture in Nova Friburgo; and the representation of value chain enablers and its supporters.**

<sup>1</sup>Governmental Support to Public institutions; <sup>2</sup>Municipality of Nova Friburgo; <sup>3</sup>ABIO core of Participative Guarantee System in Nova Friburgo; <sup>4</sup>Agricultural Inputs; <sup>5</sup>Participatory Conformity Assessment Body – ABIO; <sup>6</sup>Certification by Audit; <sup>7</sup>Implementation and Assessment of Public Regulations for Organic Production – Research done by PESAGRO

PAIS was also applied at NF with collaboration of SEBRAE and the Agricultural Municipal Secretariat of NF. SEBRAE, PESAGRO, EMATER and the NF Municipality provide access to organic farmers to their meeting rooms when farmers require them for meetings or other events. These institutions also foster partnerships which go from technical assistance until jointly meetings to find a place for

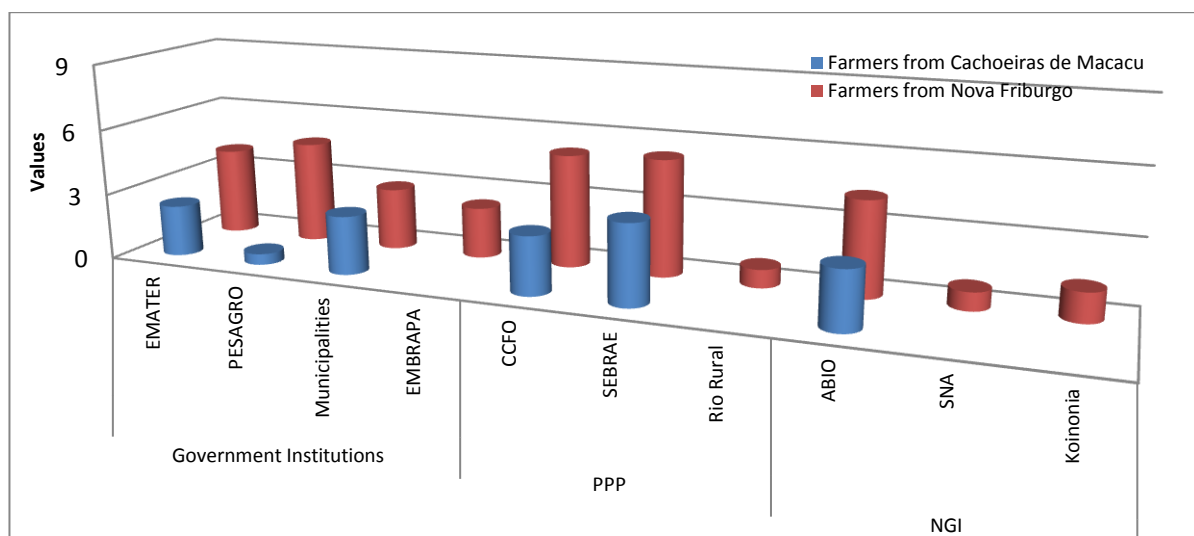
the reopening of the organic farmers market at NF. It is worth to mention that as in CM a truck was offered by the municipality to help organic farmers with transportation of their products; nevertheless this service has never been used.

There are new opportunities on the field of market intelligence with the CIOrg Project fostered by SEBRAE. PESAGRO is also promoting the creation of a local research station with focus on agricultural inputs allowed in organic agriculture which may increase the potential of this activity among other farmers. EMBRAPA is a key enabler with its incursion of agroecological research in the area.

Rio Rural Program can be a great opportunity to enhance the organic agriculture scope in the region, opening the door to other environmental friendly practices, this potential is studied jointly with PESAGRO but there are not yet concrete results of collaboration. Altogether these institutions assemble a much stronger network than the available at CM providing more opportunities to their organic farmers.

**1. The perception of Organic Farmers about the Brazilian network of institutions, programs and projects which work on the municipalities under study.**

Even when there are public policies, programs and projects as well as private initiatives available for organic agriculture, there are some obstructions to get them. Stakeholders related with organic agriculture were qualified by organic farmers, who have assigned a value of importance according to the knowledge of the actions that supporters and enablers of value chains have taken in favor of organic agriculture on these two municipalities. This information, although not a formal appraisal shows the different levels of knowledge about the actions that those entities have been making on the municipalities under study pro organic agriculture (**Graphic 10**).



**Graphic 10. Farmers’ perception about institutional presence on the municipalities under study. The value 9 represents a very important presence for organic agriculture and 0 the lack of knowledge of the entity or program**

PPP, Institutions of Public Private Partnership; NGI, Non-Governmental Institutions

Farmers from NF have identified 10 institutions which are currently working with organic agriculture as part of their agenda. For them SEBRAE-NF and PESAGRO are the leading institutions on organic agriculture; both related to mechanisms of conformity assessment. SEBRAE is providing technical assistance and facilitation on certification by audit, while PESAGRO is working with SPG as research unit to assess the capacity of implementation of public organic production regulations through this methodology. Farmers from CM have recognized 6 institutions related with organic agriculture. In CM, SEBRAE and the Agricultural Secretariat of CM, are the most recognized institutions which provide assistance on organic agriculture.

It is interesting to mention that ABIO's qualifications were divided by most farmers into CCFO and ABIO as institution; between this duality is the CCFO which has in average the greatest score. This fact is derived directly from the enhancement of sale points that due to the agreement between the Special Secretariat of Solidary Economic Development of the Rio de Janeiro Prefecture (SEDES) and ABIO has generated the CCFO. Since its approval in May 2012 (Fonseca, et al., 2011), the CCFO has been growing from one to five organic farmers markets across Rio de Janeiro. At the same time as a consequence of the approval of CCFO another circuit of organic farmers markets is growing; "Orgânicos para Todos" is an initiative that aggregates mostly ABIO's members in other locations of Rio de Janeiro to commercialize their products, which enlarge the offer of organic products in the city of Rio de Janeiro.

EMATER is a special case because farmers have assigned separate values for the institution and its programs (farmers have refereed their local EMATER in each municipality). EMBRAPA Agrobiologia and Rio Rural Program are relatively recent in the region, by what they are known in just one municipality. Nonetheless, they are identified as potential partners of technical assistance and improvement of environmental practices. SNA was mentioned by one farmer who has a bigger scale of production; and Koinonia was mentioned by another farmer who likes homeopathy. Koinonia is a NGO which works mainly in other municipalities aiming to spread agroecological practices among small family farmers.

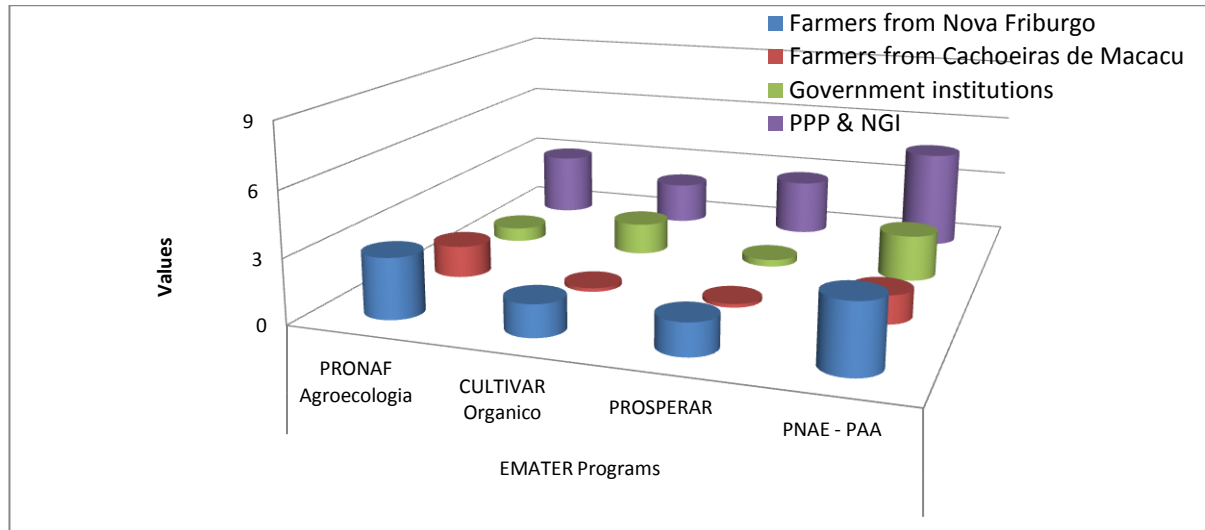
## **2. Institutional and Farmers perception about EMATER's programs addressed to organic agriculture.**

EMATER has under its supervision three different credit lines which foster organic agricultural practices; and it regulates indirectly the access to policies as PNAE and PAA -both require DAP-, see **Graphic 11**. Those aspects deserve a separate analysis, because they can enhance participation of the farmers in public programs as well as generate other value chains for direct commercialization of organic products.

Even though just one farmer from the municipalities under study has worked with these programs, all of them know about their existence. However, organic farmers do not take the governmental food acquisition programs into consideration as possible markets because they offer low prices or cannot access them because of their requirements. Despite the lack of participation: PNAE and PAA have the greatest value among stakeholders, giving them promising characteristics as long as the farmers may develop a value chain with these markets.



Farmers from NF, PPP and NGI are the stakeholders who give higher importance to EMATER's programs in the current scenario. However they give more importance to PRONAF Agroecologia, PNAE and PAA, even though they require DAP as a prerequisite to access them, leaving Cultivar Orgânico and Prosperar as less important programs, even when they do not have DAP as prerequisite.



**Graphic 11. Stakeholders perception on credit lines and food acquisition programs coordinated by EMATER. The value 9 represents a very important presence for organic agriculture and 0 the lack of knowledge of the program.**

PPP, Institutions of Public Private Partnership; NGI, Non-Governmental Institutions

### C. SWOT perception on the value chains of organic products existing at the municipalities under study, basic approach.

Even when each group of stakeholders has its own point of view on strengths, weaknesses, opportunities and threats, some points are widely shared among them. The small production and instable supply of organic products is identified as a weakness for all stakeholders. Permanent Stores and Supermarkets (PSS) and farmers markets especially denoted that the lack of fruits experienced by at their sale points is a weakness, and that an increase in this parameter would greatly increase organic products sales. Technical assistance is another weakness that Governmental institutions pointed out as the result of low investment in organic agricultural scientists training, hindering the increase of experts in this area. The threat represented by the poor awareness of organic agriculture and its divulgation among people is a common interest of all stakeholders; about this issue the PSS stated that divulgation through mass media would increase customers interest in organic agriculture. On the other hand, Government Institutions, Non-Governmental Institutions (NGI) and Institutions of Public Private Partnership (PPP) saw the importance of governmental actions in this matter especially in this period before the happening of international events in the country.

Despite those obstacles, it is believed that organic agriculture has a heavily positioned strength on the approval of CCFO, and the organic farmers in both municipalities have increased their sales since its appearance in 2010. At the same time, for PPP and Government institutions; the CCFO represents

an alternative for small scale agriculture through direct selling. However all stakeholders have highlighted that this strength cannot be maintained without farmers' organization. PSS and farmers markets have seen CCFO as an opportunity for sales expansion, while Government institutions and NGI sustain that the organization among stakeholders is a key factor, not just for sales, but for production planning as well. To these ideas, Organic Farmers and PPP have added that planning is the solution for most of the bottlenecks of organic agriculture which has to be achieved through organization and knowledge exchange among stakeholders.

Farmers from the municipalities under study presented very different paths in: organization, value chain arrangements and in their institutional network; therefore they are considered in separate parts to organize their information in a better way. Farmers markets and permanent sale points (supermarkets and stores -PSS-) that commercialize organic products have contributed with a different perspective of analysis that is expressed on the results below. Meanwhile NGI and PPP are described as one group of stakeholders to facilitate the analysis.

### **1. SWOT perception of the Organic Farmers from Cachoeiras de Macacu.**

Organic farmers from CM have indicated that the weaknesses which were addressed in the previous point were general trends in their municipality, for which they have gave the highest values. Nonetheless: the small volume of demand, group disorganization as well as labor scarcity are also important weaknesses. The management of logistic is hindering the expansion of organic farmers to other value chains, basically because transportation in this municipality is the biggest threat identified which acts as constraining factor for market access that is already scarce because the municipality does not have a strong local market for organic products (**Chart 5**). Therefore the production from CM usually goes to Sítio do Moinho or farmers markets which leave 3% to other markets (**Graphic 6**).

There are other threats to be improved in the municipality such as: limited knowledge of, public policies, programs and projects that restricts the performance of new projects; late payments and limited knowledge of coping capacity of the market.

In general terms, the value given to strengths and expectations for new opportunities is very low in this municipality, although the health of family and ecosystem are the most important strengths. This is because their products are pesticides free whereat the environmental protection is also considered as an strength. It is also important that the sales for some of these farmers are already purchased by Sítio do Moinho; institution that provides technical assistance to their farmer-partners.

A closer sale point would be the greatest opportunity for those farmers who saw in the creation of a Center of Sales and Distribution of Organic Products (CEASA "Orgânico") a chance for faster delivery of their products. They recognize that organization and partnership can be tools to propel their activities and the fair price of organic products would be an opportunity of access to a better income.

**Chart 5. SWOT analysis of the Organic Farmers from Cachoeiras de Macacu.**

Strengths	Value	Weaknesses	Value
Family health	5.14	Lack of technical assistance	6.00
Product free of pesticides	3.57	Small production and instable supply of organic products	5.17
Ecosystem health	2.57	Poor logistic management (selling communication, inventory)	5.00
Technical assistance	2.57	Group disorganization	4.33
Environmental protection	2.00	Small volume of demand	4.00
Tied sell	2.00	Labor scarcity	3.17
Approval of CCFO-RJ	1.86	Poor soil fertility	1.67
Exchange of information through SPG	1.71	Lack of means for communication	1.17
Family income	1.43	Poor road maintenance	1.00
Farm administration	1.43		
Opportunities	Value	Threats	Value
Closer sell point	3.14	High costs for transportation	8.33
Farmers organization for selling	3.00	Distance to the final customer	5.50
Fair price of products	2.86	Limited market access	5.33
Creation of a CEASA for organic products	2.71	Poor awareness and divulgation of organic agriculture among	5.17
Divulgation of O.A. (Copa Verde)	2.14	Limited knowledge about public policies, programs and projects	4.67
Sells for restaurants	1.43	Uncertainty of selling at the market	2.50
Partnerships for selling	1.43	Late payments	2.33

To positive issues 9 is the top of the scale, being the more important or the more helpful or indisputable factor for improving commercialization. In negative points, 9 is placed to the issue which causes more damage, or creates the biggest obstacle for commercialization of organic products.

## 2. SWOT perception of the Organic Farmers from Nova Friburgo.

The most important weaknesses identified at NF correspond to group disorganization, the lack of technical assistance and labor scarcity, matching in this sense with those weaknesses identified at CM. (Chart 6) Nonetheless this group looks at the lack of production planning and the small production and instable supply of organic products like subsequent weaknesses in the scale due to the fact that their logistics management requires a wider control over their market organization. They acknowledge as a weakness the high initial cost for conversion into organic agriculture, and pointed out an unfair price of organic products due to the work that these products require. This argument is consistent with the affirmation made about low payments received by agricultural workers who depend just of organic agriculture as income source. An important highlight is the inclusion of the impact generated by other wages as a weakness that hinder the process of commercialization of organic products; which is explained by the impossibility of propel the activity because of the disinterest showed by “neururais” to invest in long-term actions.

The limited knowledge of policies, programs and projects which foster organic agriculture is the biggest threat for organic farmers from NF. They sustained that the divulgation of organic agriculture as well as market access are limiting factors nowadays for commercialization of organic products. Other threats mentioned by farmers from both municipalities are the high costs of transportation and the late payments of buyers; these factors are highly related with the value chain that is being used, in this case PSS. Factors as: the low production yields, the lack of programs which embrace complete processes of organic agricultural conversion as real field examples and the lack of certified organic seed provision are new threats identified by this group; which are the same mentioned by Governmental institutions (Chart 9).

**Chart 6. SWOT analysis of the Organic Farmers from Nova Friburgo.**

Strengths	Value	Weaknesses	Value
Family health	7.17	Lack of technical assistance	7.17
Family income	6.67	Group disorganization	7.17
Delivery baskets	5.33	Labor scarcity	6.17
Keeping soil fertility	5.17	Small production and instable supply of organic products	5.50
Ecosystem health	4.50	Lack of production planning in group	5.50
Approval of CCFO-RJ	4.50	High initial conversion cost	5.33
Institutional administrative organization	4.00	Non fair price of the products	3.50
Exchange of information through SPG	2.00	Poor logistic management (selling communication, inventory)	2.67
		Small volume of demand	2.50
		Low payments for labor	2.33
		Poor access to information of Organic products marketing	2.17
		Impact of other wages	1.50
Opportunities	Value	Threats	Value
Farmers organization for selling	7.17	Limited knowledge about public policies, programs and projects	5.50
New potential commercialization channels	5.33	Poor awareness and divulgation of organic agriculture among	3.83
Fair price of products	4.17	Limited market access	3.50
Customer organization	2.83	Lack of programs for conversion to AO	3.33
Weather	2.00	High costs for transportation	2.83
Environmental Training	1.83	Low production yields	2.67
Creation of a CEASA for organic products	1.67	Lack of organic seeds provision	2.33
		Late payments	1.17

To positive issues 9 is the top of the scale, being the more important or the more helpful or indisputable factor for improving commercialization. In negative points, 9 is placed to the issue which causes more damage, or creates the biggest obstacle for commercialization of organic products.

As a difference with farmers from CM, here we found very high values for threats and weaknesses but at the same time high values for strengths and opportunities which are clearer for this group of stakeholders. The most important strengths remain being family health and ecosystem health. However family income is the second most important fortress described by farmers from NF; this variable is consequence of the importance of the approval of the CCFO as well as the increasing demand of home delivery baskets which are the strongest value chains in this municipality for most farmers. The administrative organization represented by enablers and supporters of value chains is also considered as a strength which in turn promotes the exchange of information through SPG.

The most valuable opportunity for this group is organization which can serve as a tool for accessing new value chains. The price of organic products is seen as opportunity that can be enhanced with a CEASA "Orgânico". Environmental training is also a new opportunity for these farmers who produce in only 8% of their land. Finally, farmers from NF have considered customer organization an opportunity that may reduce steps in the commercialization process.

### **3. SWOT perception of the managers of Farmers Markets that commercialize organic products from Cachoeiras de Macacu and Nova Friburgo.**

At farmers markets, the most important weakness is the lack of continuity of organic products supply. This is crucial especially in fruits which are not available year round. However, managers at farmers markets have identified some farmers who can have a continuous variety of fruits along the

year; therefore they wonder whether fostering of this activity in Rio de Janeiro through technical assistance would help to solve the problem (**Chart 7**).

Rio de Janeiro is the state with the biggest horticultural consumption<sup>17</sup>, therefore we can find a wide variety of vegetables in every sale point of the state. However logistics to bring organic vegetables towards farmers markets is considered as a weakness, which together with a poor technical assistance are following in importance to the other weaknesses already mentioned in the last paragraph. The prices at farmers markets are still hindering the expansion of organic product sales, nonetheless the prices offered in organic farmers markets are up to 40% less expensive than those found at supermarkets and specialized stores<sup>18</sup>. In addition to these factors, garbage management, excessive packaging and arrangement of products on the stand are also issues to improve. The parking space for clients is also a weakness at some locations, leaving the lack of uniformity in organic products as the less important weakness, because customers have broken the preconception that giant, shiny products are a synonym of good quality<sup>19</sup>.

Threats for farmers markets are represented by the high cost of transportation, which increase the final price of products. This group also considers that an absence of governmental pro organic policies is a constant threat because of the fragility of agreements made, for example; the approval of CCFO which was established by SEDES is not yet a regulation, and due to the fact that the SEDES is a temporary Secretariat, it can disappear with a political restructuring, which weaken the agreement. Poor coverage of mass media is also a threat for this group even though they recognize that markets which had a consistent promotion before opening are those that are running better. In the most demanding markets, the lack of dairy products represents a threat because customers are constantly complaining about the lack of these items.

**Chart 7. SWOT analysis of the managers of Farmers Markets from Rio de Janeiro which commercialize organic products from the municipalities under study: CCFO & “Orgânicos para Todos”.**

Strengths	Value	Weaknesses	Value
Approval of CCFO-RJ	8.33	Lack of continuous local production; especially of fruits	5.17
Fair price in comparison to supermarkets	4.50	Poor logistic management (selling communication, inventory)	4.58
Quality of the products	4.17	Poor variety	4.50
Sells stability at the market	4.00	Lack of technical assistance to farmers	4.17
Distinctive products packaging	3.83	The prices are still high to reach a broader audience	3.83
Constant seller explanation	3.67	Garbage management	3.00
Variety of vegetables	3.00	Arrangement of the products	2.67
Easy access to the market place	3.00	Excessive packing of vegetables	1.67
Divulgate in mass media	2.83	Lack of parking space	1.00
Variety of events on the fair	1.50	Lack of uniformity	0.83
Opportunities	Value	Threats	Value
Fair price for the customer	4.33	High costs for transportation	5.83
Farmers organization for selling	3.67	Absence of pro-organic public policies	3.83
Upcoming mega-events	2.83	Poor awareness and divulgation of organic agriculture among	3.17
Logistic management along the chain	0.17	Lack of dairy products at the market	1.33
		Customer safety in the parking space	0.83

To positive issues 9 is the top of the scale, being the more important or the more helpful or indisputable factor for improving commercialization. In negative points, 9 is placed to the issue which causes more damage, or creates the biggest obstacle for commercialization of organic products.

<sup>17</sup> R. Assis, personal communication, March 3, 2012

<sup>18</sup> F. Serafini, personal communication, May 26, 2012

<sup>19</sup> J. Monteiro, personal communication, May 24, 2012

The strongest strength without doubt has been the approval of CCFO, which has opened the door for implementation of farmers markets in the city of Rio de Janeiro, this together with the high quality of organic products perceived by managers of organic farmers markets, and stability of sales constitute the major advantages in this matter. In the case of Individual sellers (organic farmers or organic representatives) at organic farmers markets, a distinctive packaging on their products and wide variety of different products are strengths which help the customer to recognize particular products. The constant explanation made by the sellers about the cycle followed by organic products from the farm to the fair stand as well as fair prices are also important. An easy access to the market place is essential (parking space, central point of commerce) as well as the events that occur within the farmers market. As an example, in Jardim Botânico and Gloria, there are usually dance performances or yoga classes, which help with the variety of customers and offer an extra value to the act of purchase. Finally, recent attention to farmers markets due to Rio+20 has been an advantage for publicity in mass media.

The main opportunity at farmers markets is the fair price for the consumer. This can be exponentially exploited at the mega-events which will take place in the city, although it will require a better organization of the farmers in order to improve management of logistics along the value chain; taking advantage of the estimations made by managers of organic farmers markets, which sustained that 77 % of products come from Rio de Janeiro and 23 % of them come from other places.

#### **4. SWOT perception of the Permanent Stores and Supermarkets (PSS) that commercialize organic products from Cachoeiras de Macacu and Nova Friburgo.**

The PSS which commercialize organic products from the municipalities under study have a very concise view in their SWOT perception, having the smallest amount of issues in their SWOT analysis among all stakeholders (**Chart 8**).

Organic products are still expensive by PSS. They consider that the arrangement of the organic products in their sale points is the second most important weakness for organic product sales, we should quote that the arrangement of products at these sale points is mostly done by the farmer who delivers them. This group sees in the lack of uniformity of the products that they receive a great disadvantage (this can be explained because the different sizes of products have different life spans which at the end have consequences on the internal attention that need to be addressed to this section of the supermarket by their employees).

This weakness is followed by the lack of continuous supply of local organic products, especially fruits. They state that a poor variety of organic products is still perceived at this final sale points; as some manager pointed out: “no one wants to see just broccoli on the stand, our consumers want to have a wider variety of products on the stand in order to satisfy their need of organic products”. This vision agrees with one pointed out by one consumer at organic farmers markets; she said that, “if the final sale points have more variety they could buy only organic products”. The most important threat found at this level is the divulgation through mass media, as they say; this is a factor that may enhance customer awareness about organic agriculture importance.

The good quality perceived in organic products and the constant explanation of sellers about the advantages of organic products were identified as the biggest strengths for this group of stakeholders; a distinctive packaging and/or labeling in the product also improves the sales of organic products. Interestingly, the representative of the store Sítio do Moinho mentioned that the approval of CCFO is a great advantage for organic farmers which is extensive to bigger sale centers. For this group an improvement on the opportunities for the commercialization of organic products is related to: a good management of logistics, the organization of organic farmers and their joint planning of the production; which at the end could benefit the customer with fair prices even lower than those shown with present conditions.

**Chart 8. SWOT analysis of the Permanent Stores and Supermarkets (PSS) which commercialize organic products from the municipalities under study.**

Strengths	Valor	Weaknesses	Valor
Constant seller explanation	4.00	The prices are still high to reach a broader audience	4.83
Quality of the products	4.67	Lack of uniformity	1.83
Distinctive products packaging	2.67	Arrangement of the products	2.83
Approval of CCFO-RJ	1.33	Poor variety	1.00
		Lack of continuous local production; especially of fruits	1.33
Opportunities	Valor	Threats	Valor
Logistic management along the chain	3.00	Poor awareness and divulgation of organic agriculture among	2.75
Farmers organization for selling	1.50		
Fair price for the customer	1.00		
Production planning by farmers	1.50		

To positive issues 9 is the top of the scale, being the more important or the more helpful or indisputable factor for improving commercialization. In negative points, 9 is placed to the issue which causes more damage, or creates the biggest obstacle for commercialization of organic products.

Most of the points stated by this stakeholders group match with those mentioned for managers of farmers markets, even though all values show a very low range at the final estimation.

## 5. SWOT perception of the Government institutions that work at Cachoeiras de Macacu and/or Nova Friburgo.

Government institutions specifically have pointed out to technical assistance as a weakness which is far more important than all other factors. They have also recognized that a high initial cost for conversion to an organic farming model is a considerable weakness. Farmers disorganization and lack of production planning constitute for this cluster of stakeholders, causes for instable supply and small production. Lack of knowledge of production costs, labor scarcity as well as poor access to information of organic products marketing could affect prices, which are still high to reach a wider customer sector. The impact of extra wages is also considered as a weakness for the production, commercialization and consumption system of organic products (**Chart 9**).

This group of stakeholders sees in the limited market access, a threat for commercialization of organic products. This point is strongly related with access to public programs<sup>20</sup> such as the National

<sup>20</sup> Detailed information may be found at: <http://www.mda.gov.br/portal/saf/programas/>

School Feeding Program (PNAE) and the Food Purchase Program (PAA), which are addressed as key markets for organic products that might be used by organic farmers. The high cost of transportation of organic products due to the fact of having distant markets and a scarce knowledge in mass media about organic agriculture and its benefits are also considered as current threats for organic farming.

The limited governmental investment on training of organic agricultural technicians is pondered as other threat which aggravates problems such as: the lack of long term programs for conversion to organic farming, the non-constant supply of organic inputs to farmers and the lack of organic seeds provision, which is closely related with the ideas expressed by organic farmers (**Chart 5 and Chart 6**). Family income, health, and the maintenance of soil fertility are important strengths of: the systems of production, commercialization and consumption of organic products, which are recognized by the Government Institutions. It is also important the exchange of information among different stakeholders which is carried out by the SPG of the local ABIO cores. In this context, Government Institutions provide physical infrastructure where meetings can be held, the administrative organization provided by public institutions is a strength too which is recognized by farmers and government institutions. It is also worth to mention in this sense, the importance of the research trends on commercialization and environmental protection which are kept by EMBRAPA Agrobiologia and PESAGRO with its office in NF. Nonetheless, even when public institutions have mentioned a wide variety of current strengths, it is curious to see that they have a very low value when we compare them with other aspects of their SWOT analysis.

**Chart 9. SWOT analysis of the Government Institutions related with value chains of organic products from the municipalities under study.**

Strengths	Value	Weaknesses	Value
Institutional administrative organization	2.17	Lack of technical assistance	7.00
Exchange of information through SPG	2.00	Small production and instable supply of organic products	5.67
Family income	1.83	Group disorganization	4.83
Keeping soil fertility	1.83	High initial conversion cost	3.33
Fair price in comparison to supermarkets	1.50	Labor scarcity	3.00
Family health	1.33	Poor access to information of Organic products marketing	2.67
Physical infrastructure	1.33	Lack of production planning in group	2.50
Commercialization research	1.17	Small crop variety	2.50
Environmental protection	0.50	The prices are still high to reach a broader audience	2.33
		Impact of other wages	1.67
		Lack of credit lines for organic agriculture	1.17
		Small volume of demand	0.83
		Lack of knowledge of production costs	2.67
Opportunities	Value	Threats	Value
New potential commercialization channels	4.17	Limited market access	4.33
Farmers organization for selling	3.83	High costs for transportation	3.67
Public policies as PNAE, PAA	3.67	Poor awareness and divulgation of organic agriculture among people	2.33
Environmental law compliance	2.50	Lack of organic seeds provision	1.50
Agroecologic transition research	2.33	Lack of continued supply of inputs for OA	1.50
Closer sell point	1.17	Limited governmental investment in organic agricultural training	1.50
		Distance to the final customer	1.17
		Late payments	1.17
		Lack of programs for conversion to AO	1.17

To positive issues 9 is the top of the scale, being the more important or the more helpful or indisputable factor for improving commercialization. In negative points, 9 is placed to the issue which causes more damage, or creates the biggest obstacle for commercialization of organic products.



As opportunities within the systems of production, commercialization and consumption of organic products, government institutions have described the opening of new sale points and new policies that promote acquisition of organic products, to which can be accessed through farmer organization (with the limiting factors mentioned in the section VII, B). These sale points may also represent closer markets which in turn act reducing steps in the value chain and transportation costs. Another opportunity is the compliance of environmental regulations which allows organic agricultural practices in buffer areas of preservation zones; this favors organic initiatives because some farmers have lands that falls in this category. Finally, the research that would be promoted by local institutions is a constant opportunity to foster organic agricultural practices.

#### **6. SWOT perception of the Non-Governmental Institutions (NGI) and Institutions of Public Private Partnership (PPP) that work at Cachoeiras de Macacu and/or Nova Friburgo.**

This group of stakeholders is integrated by PPP and NGI which are involved in the value chains of organic products from the municipalities under study. They have identified several weaknesses in the current systems of production, commercialization and consumption of organic products from which technical assistance is the main issue, followed by the small production of organic products and its unstable supply. To this respect, ABIO recognizes that even when farmers markets are supplying organic products year round to the city of Rio de Janeiro, summer months have a significant drop for organic production.

As well as other stakeholders, this sector states that farmers' disorganization can be an important weakness for commercialization, where processes as logistics management and traceability are even weaker. The lack of production planning in group is also an important disadvantage, related with the lack of knowledge about production costs and poor access to information of organic products marketing.

As intersection with other stakeholders, the high transportation costs of having distant markets, poor public awareness about organic agriculture and uncertainty in long term policies are direct threats for the systems of production, commercialization and consumption that built the value chains of organic products. Among the particular points mentioned by this group is found that regulations for the entrance of heavy vehicles to Rio de Janeiro, and the excessive bureaucracy for sanitary registration hinder the sales potential of organic products. In addition to that, certification costs for organic agriculture also represent heavy obstacles for this activity (**Chart 10**).

This group of stakeholders matches several strengths previously identified by other stakeholder groups; where family income and the exchange of information through the SPG among members of local ABIO's cores are the most important factors. This group also points out the fact that institutional administrative organization has been a strength which also helps with technical assistance in administrative aspects. This is the case of SEBRAE-RJ with its program about Intelligence Center in Organics. Furthermore, Sítio do Moinho in Cachoeiras de Macacu and the local SPG of Nova Nova Friburgo are spaces to articulate ideas from different Government Institutions and NGI in order to exchange knowledge about organic farming. On the other hand the approval of CCFO has helped consumers increasing the number of organic product sale points and also offering fair

prices to organic products. Lastly, this group recognizes the importance of keeping soil fertility which, as they remarked; enhances the possibility of long term farming.

**Chart 10. SWOT analysis of the Non-Governmental Institutions (NGI) and Institutions of Public Private Partnership (PPP) with action on the municipalities under study.**

Strengths	Value	Weaknesses	Value
Family income	4.25	Small production and instable supply of organic products	6.50
Exchange of information through SPG	3.50	Lack of technical assistance	6.00
Keeping soil fertility	2.50	Group disorganization	4.00
Technical assistance	2.50	Poor logistic management (selling communication, inventory)	3.25
Institutional administrative organization	2.25	Lack of production planning in group	2.25
Family health	2.25	Traceability of organic products	2.25
Value added	2.25	Labor scarcity	2.00
Commercialization research	2.00	Lack of knowledge of production costs	2.00
Approval of CCFO-RJ	1.75	Poor access to information of Organic products marketing	1.75
Fair price in comparison to supermarkets	1.00	Limited growth of farmers markets as commercialization channel	1.75
Opportunities	Value	Threats	Value
Increasing demand	5.75	High costs for transportation	5.50
Upcoming mega-events	4.25	Poor awareness and divulgation of organic agriculture among	1.75
New potential commercialization channels	2.75	Bureaucracy to sanitary accreditation.	1.75
Farmers organization for selling	2.25	Regulations for heavy cars in Rio de Janeiro	1.75
Sells for restaurants	2.25	Uncertainty of long term government support towards OA	1.25
Closer sell point	1.75	Certification costs	0.75
Public policies as PNAE, PAA	1.75		
Creation of a CEASA for organic products	1.75		

To positive issues 9 is the top of the scale, being the more important or the more helpful or indisputable factor for improving commercialization. In negative points, 9 is placed to the issue which causes more damage, or creates the biggest obstacle for commercialization of organic products.

Nowadays the increasing demand of organic products, especially in the city of Rio de Janeiro, represents the greatest opportunity since this demand would be fostered by upcoming mega-events to be held across the country, and specifically at Rio de Janeiro. These opportunities are leading a potential entry in new value chains such as PNAE or PAA, which are promoted by Government Institutions and other initiatives such as restaurants or even the creation of a CEASA for organic products. All the above points are heavily dependent on the stage of cohesion crossed by farmers, facilitators and supporters of the value chain.

#### **D. Commercialization; the most traded products from the municipalities under study in 2011 and its sale potential.**

In general terms, most of the organic vegetables commercialized by permanent stores, supermarkets and farmers markets which sell products from the municipalities under study come from Rio de Janeiro. However there are great variations in the case of fruits and, generally most of the processed organic products come from outside the State. This study has divided vegetables and legumes into three groups: (1) roots, bulbs and tubers; (2) leaves and; (3) fruits and flowers; leaving processed products and fruits as separate groups (**Annexes 8, 9, 10**).

In NF, all interviewed supermarkets commercialize local products and three of them commercialize only from their local sources; being one farmer responsible for almost all sales. In general terms,

legumes and vegetables come 96% of the time from NF and the other 4% come from other places inside the State of Rio de Janeiro; 82% of fruits come from NF and 18% from other places inside the State of Rio de Janeiro. Finally, 74% of the processed organic products come from NF, 6% from inside Rio de Janeiro and 20% from other places outside the State of Rio de Janeiro (Supermarkets that commercialize products from local sources have mainly salads ready to eat as processed products). In the case of the Sítio do Moinho store, which commercializes products from CM, all horticultural products sold at the store come from Rio de Janeiro, however, they estimate that 70% of their fruits come from outside the State of Rio de Janeiro and also 75% of the processed food, leaving 30 and 25% respectively from suppliers that are inside the State of Rio de Janeiro. Sale estimations of organic products in the municipalities under study, based on the interviews made to the supermarkets from NF and the data kindly provided by Sítio do Moinho, for 2011 were around R\$ 273,000.00 (the study considers that all products sold to Sítio do Moinho went through this value chain). As we saw before, at least for Sítio do Moinho the tendency is to rise, with an increase in the volume purchased of 4.17 times in the first four months of 2012 in comparison with the same period from 2011 (with data of one farmer sample).

Farmers markets' managers (CCFO and "Orgânicos para Todos") estimate that 77% of the organic products come from Rio de Janeiro and 23% from outside the State; as the offer comes from different places, they were not able to identify how much comes from CM or NF. The vegetables from group 1 come 86% of the time from inside the State of Rio de Janeiro; group 2 is completely from the State while group 3 has 98% of its vegetables coming from inside the State of Rio de Janeiro. As we said before, there is a big variation along the year regarding fruits but, managers estimate that about 83% come from inside the State. The processed products are in the opposite side with 66,6% from other places outside the State of Rio de Janeiro. These 11 sale points were responsible in 2011 for R\$ 153,370.00, including conventional farmers markets where organic products are sold. This value chain is also growing at healthy pace and estimations for one organic farmer showed that the total amount sold has increased 4.65 times in the first four months of 2012 in comparison with the same period from 2011.

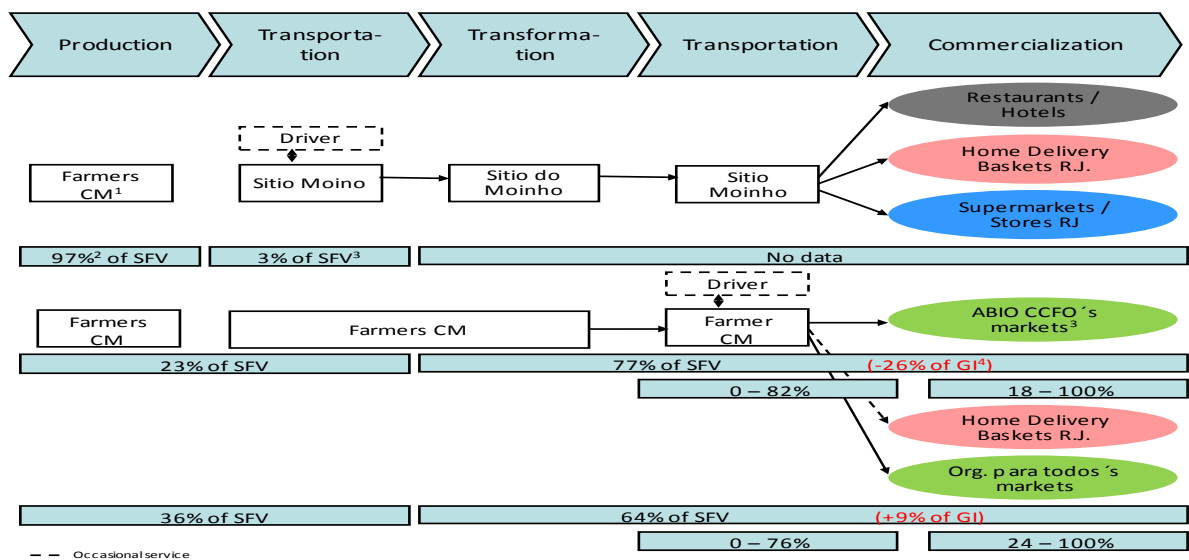
Most organic farmers found that home delivery baskets are a noteworthy opportunity. This value chain usually overlaps with farmers markets (all at Rio de Janeiro with occasional provision), specialized stores (2 in NF) and supermarkets (5 in NF), being those the central points of products distribution. However farmers from Nova Friburgo have two consolidated chains and they are exploring new possibilities in this value chain in order to expand their sale points in Rio de Janeiro permanently. In 2011, estimations based on referential prices and lists of weekly sales, represented for both municipalities a total amount of R\$ 43,040.00.

The quality characteristics of the top sale products are divided into freshness (in the case of vegetables and legumes), the intrinsic value of being pesticide free products, and their appearance. Other factors as labeling, sanitation of the products, and variety are also important. This last one especially at farmers markets in which are added the fair price of products, easiness of traceability and recovery of traditions, as other important features that need to fulfill organic products to be top sales.

As is shown in section A of this chapter, the value chains of organic products in these municipalities follow their own features, thereby is worth to visualize separately the steps that are taken to get the final market as well as their share of the final value added to organic products.

Cachoeiras de Macacu (CM) is characterized by three main value chains (**Graphic 12**). The first one provides organic products for Sítio do Moinho, in this value chain was identified that transportation can take up to 3% of the price that farmers receive for their products when Sítio do Moinho does not come to pick up the products from their farms - the study could not embrace the whole value chains in this case, leaving the research up to the cost that represented transportation for this farmers. This low value of transportation is due to the fact that farmers are sending the products in boxes which range from 18 to 25 kg each for which transport cost 2 reais each. However this is because the driver who does the transportation has other business of delivery. Nonetheless if farmers are not able to match collection and transportation they have the risk of keep all the harvest inside the farm; in which case, farmers market becomes the most likely alternative even when the capacity of selling at farmers markets is lower.

Farmers markets and home delivery baskets work usually as jointly commercialization channels, since it is at farmers markets where consumers most of the time are coming to pick up their baskets. In the markets managed by farmers from CM there is no minimum price to make a purchase as it is in NF. Organic farmers in CM, who are organized through ABIO's core, have one of their members who collects all products and goes to sell them in Rio de Janeiro, and once in Rio de Janeiro the products are distributed through four farmers markets: Jardim Botânico (CCFO) and Botafogo that are set on Saturday and Laranjeiras and Flamengo that work on Tuesdays.



**Graphic 12. Distribution of value through organic value chains of farmers from Cachoeiras de Macacu.**

<sup>1</sup>Cachoeiras de Macacu; <sup>2</sup>The value chain was studied up to the second step of commercialization as is shown in the graphic; <sup>3</sup>Share of final value received by value chain participants; <sup>4</sup>Gross income; <sup>5</sup>Carioca Circuit of Organic Farmers Markets

In the value chain that ends up at the farmers market from CCFO, in 2011, 23% of total share of the final value of organic production went to organic farmers who harvest and take their products to a common place, where the farmer who sells the products is responsible for collect, weigh and in

some cases bag the products. In the other hand, the other 77% went to the farmer responsible to make the sales, who covers with it the management, transportation and commercialization. In this research was detected that this amount is not covering all the expenses generated by the activity; mainly because transport and commercialization are factors that have a huge weekly variability, being transportation (gasoline, toll and driver) responsible from 0 to 82% of the income received by the farmer who commercialized the products. This is due to the fact that sometimes all the expenses were charged to the other market that runs in parallel to this one; nevertheless the factor which varies the most is the payment to the driver. On the other hand, the commercialization which accounts for labor and market fees of stand and divulgation, goes from 18 to 100% of the total share that receive the farmer who commercialized the products. In this case the factor that varies the most is the labor of helpers who receive a daily payment for selling organic products. The analysis revealed that the farmer who sells the products at the market has to cover 26% of the expenses with the sales corresponding to his products (**Graphic 12**).

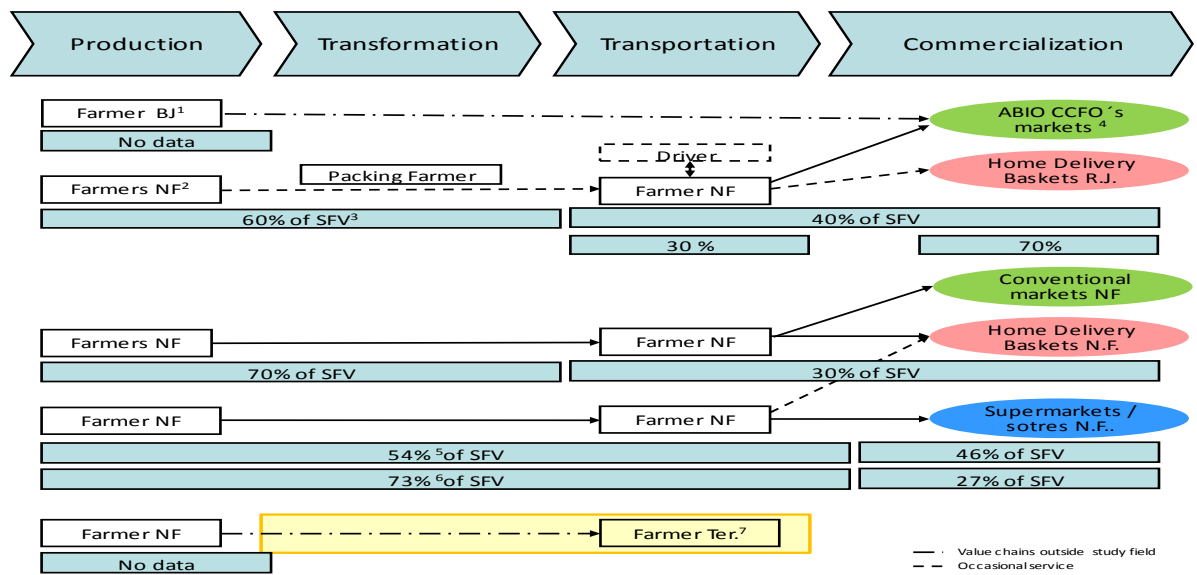
In markets that are managed by “Orgânicos para Todos” farmers in 2011 have received 36% of the final value of organic production generated in sales, and the remaining 64% goes to cover expenses of transportation and commercialization. In this case, from the weekly expenses; the transportation goes from 0 to 76%, and the biggest variation is represented by gasoline, while the variation of commercialization goes from 24% to 100%, having as it was before daily helpers as the most variable factor. The analysis concluded that, 9% of the share received by the farmer, who commercializes the organic products at farmers markets, became gross income for this case even though the general average showed us a negative outcome.

Nova Friburgo (NF) is characterized also by three main value chains for organic products, the difference from CM is that all of them are followed by farmers or representatives of them up to the final sale point which gives the name to the respective value chain. However this municipality has other minor channels which were not explored. The first case is the farmer from Bom Jardim who sells his products mainly to NF but also has other commercialization channel. The second case is the farmer who commercializes mainly fruits, with other municipalities; see **Graphic 13**.

Not all organic products from NF are commercialized at organic farmers markets, there are five markets from CCFO which are currently supplied by farmers from NF (Leblon, Jardim Botânico, Tijuca, Bairro Peixoto and Ipanema). In addition to that, organic farmers from NF have other local sale points where organic products are delivered; these are two conventional farmers markets set at NF (Suspiro and Olaria) where organic products are sold together with other stands of conventional crops of other farmers.

The value chain that ends at CCFO is also used as meeting point where consumers from Rio de Janeiro can retrieve their baskets, in which two farmers are responsible to collect the production in a central point in NF and commercialize it at CCFO. One of the farmers is also packing some products that come without packaging and also weighs them to standardize their sizes (this products usually come from Bom Jardim). In general farmers, who are also responsible for packaging their products; receive 60% of the final value produced by sales. The remaining 40% goes to the farmers that sell the organic products at CCFO; this amount is distributed between transportation (gasoline, toll and driver) which reaches 30%, and commercialization (labor and market fees of stand and divulgation) which makes 70%. This was the agreement at which farmers arrived last year (2011) after several

attempts to recognize the costs involved in the whole process. However, the production they had at that time was lower than the one that goes through the channel nowadays.



**Graphic 13. Distribution of value through organic value chains of organic farmers from Nova Friburgo.**

<sup>1</sup>Bom Jardim; <sup>2</sup>Nova Friburgo; <sup>3</sup>Share of final value received by value chain participants; <sup>4</sup>Carioca Circuit of Organic Farmers Markets; <sup>5</sup>Data computed from: spinach, kale, carrots and salad ready to eat; on May 3, 2012 at Tutifruti and personal interview with the farmer; <sup>6</sup>Data computed from: lettuce, tomato, carrots, broccoli, onions, spinach and kale; on May 3, 2012 at SMART Grão da Serra and personal interview with the farmer; <sup>7</sup>Teresópolis

The farmers who commercialize their products through home delivery baskets and local conventional farmers markets in 2011 have received 70% of the total sales and expended 30% as result of commercialization and transport. This is a channel that generates good expectations; due to the fact that even when it was barely consolidated last year, for associated farmers. It has been rising rapidly and is reaching nowadays 14% of the total commercialized by the farmers who do it in an associative way in NF.

Based on the data from multiple sources, there were done estimations about the share of final value at the value chain which ends up on supermarkets and specialized stores in NF. The farmer who commercialized with this network mentioned that Tutifruti and Superpão are supermarkets that have a different price for their products. Later in the interview with those shops was found that 54% of the final value generated by the commercialization in these supermarkets went to the farmer, while the remaining 46% correspond to the share perceived by the supermarket. The farmer also had mentioned that all other 5 supermarkets commercialize their products with shorter margins of gains, which was confirmed at field work research. For those 5 supermarkets a 73% percent of the final sales was taken by the farmer, while 27% stayed with the retailer. Nonetheless we have to account that this farmer takes under his responsibility production, transformation and transportation of organic products which implies more production costs.

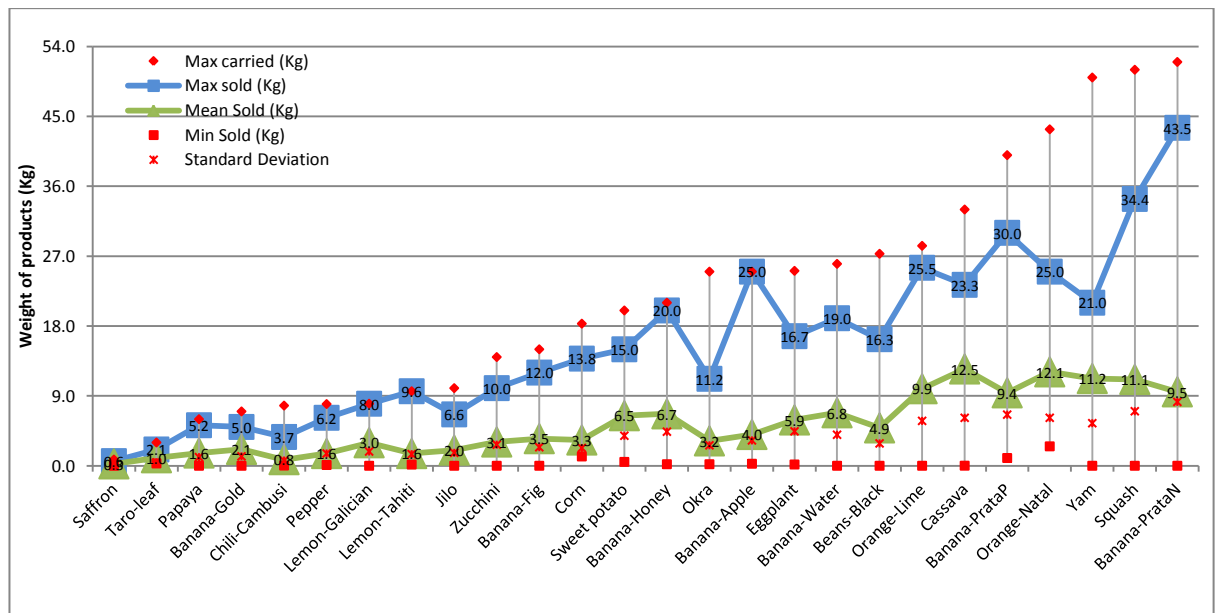
**1. Production of organic farmers from Cachoeiras de Macacu in 2011 and its weekly variability in offer of products at farmers markets.**

The farmers markets where people from CM commercialize their products are all organic farmers markets, distributed among ABIO and “Orgânicos para Todos”. The research found, based on a balance of all farmers markets; that only 23 products were commercialized continuously from 8 to 11 month, 43 of them appeared from 3 to 7 months, while 38 had appeared at least in 1 or 2 months along 2011.

The data from Cachoeiras de Macacu of the organic products commercialized through farmers markets in 2011 show that 22% of the 104 products that were sold at farmers markets in 2011 were responsible for 83% of the volume sold. There was also found that, in average, most of the crops have been brought in excess to this commercialization channel. The average of product loss in 2011 reached 31.5% for 26 of the most commercialized products, while the rest of crops had had in average 27.1% of losses.

**Graphic 14** is intended to show how is the average variation, so producers can see the safer amount of products which could be sold at farmers markets. In this graphic we can observe that seven varieties of banana are part of the most sold organic products, four citrus species, roots represented by yam and cassava are also found as well as squash, okra, beans and zucchini as major crops of this value chain.

In **Annex 11** can be seen the whole list of crops currently planted in CM which can be used as a tool for enablers and promoters of value chains, as well as by farmers from the municipality to explore mechanisms of chain upgrading.



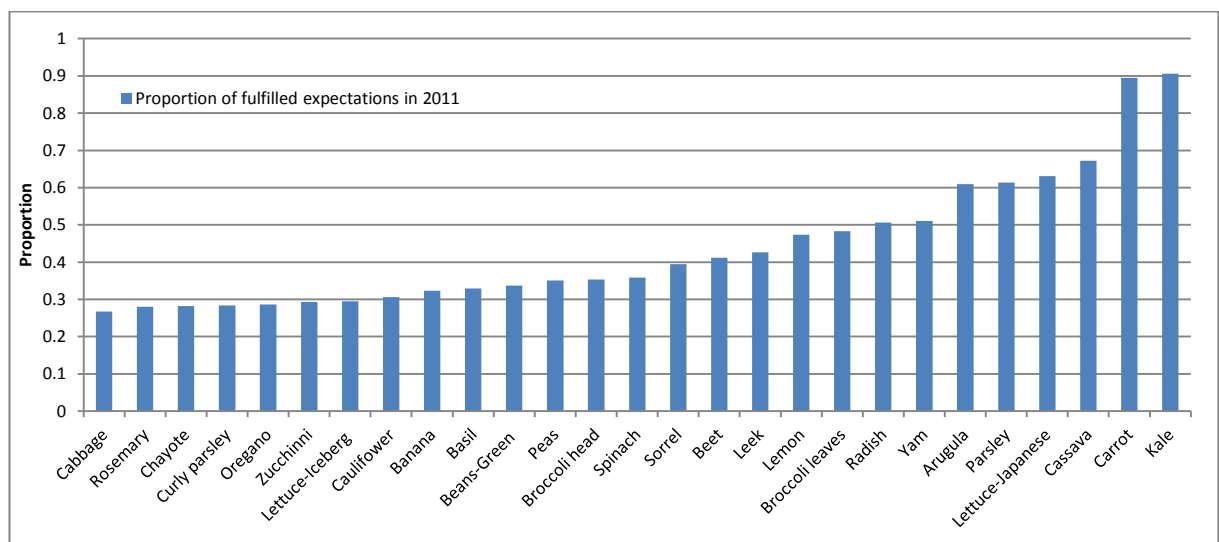
**Graphic 14. Weekly variability in the offer of the most traded organic products from Cachoeiras de Macacu that have been commercialized at organic farmers markets in 2011, based on weight of organic crops.**

**2. The production of organic farmers from Nova Friburgo in 2011 versus expectations for 2012 sales, at farmers markets.**

Different from CM, farmers from NF have established already expectations about the limits of their sale points, showing a more consistent knowledge about the market. They have set a quota for each market and for most of the 86 products commercialized by this value chain. The information about these markets (kindly provided by organic farmers) was computed in order to know whether they are meeting their expectations or not. These expectations are shown in **Graphic 15**, where we see the crops that satisfy farmers' expectations from 25% onwards. Those 27 crops are compiling 80% of the total weight which was sold in 2011.

It is very interesting seeing that there are 8 crops which meet that farmers' expectations up to 50% (kale, carrot, cassava, Japanese lettuce, parsley, arugula, yam and radish). Also the investigation found that even when in general terms none of the crops have fulfilled a 100% the organic farmer expectations, there are problems of distribution among markets, showing that: Ipanema is taking more than twice the expectations of cassava which affects in losses of this crop; in the same way at Bairro Peixoto farmers market, radishes, carrots and Japanese lettuce are slightly over the maximum expected. Leblon was also exceeding their planned capacity in broccoli leaves, carrots and kale, surpassing by 50% the expectations made on yam.

Crops that were close to exceed the expectations are: kale in Jardim Botânico as well as arugula, peas, Japanese lettuce and basil in Leblon. These data has reflected that Organic Farmers have to make adjustments to continue having an appropriate management of organic farmers markets, because those same crops are not covering the expectations planned into other markets.



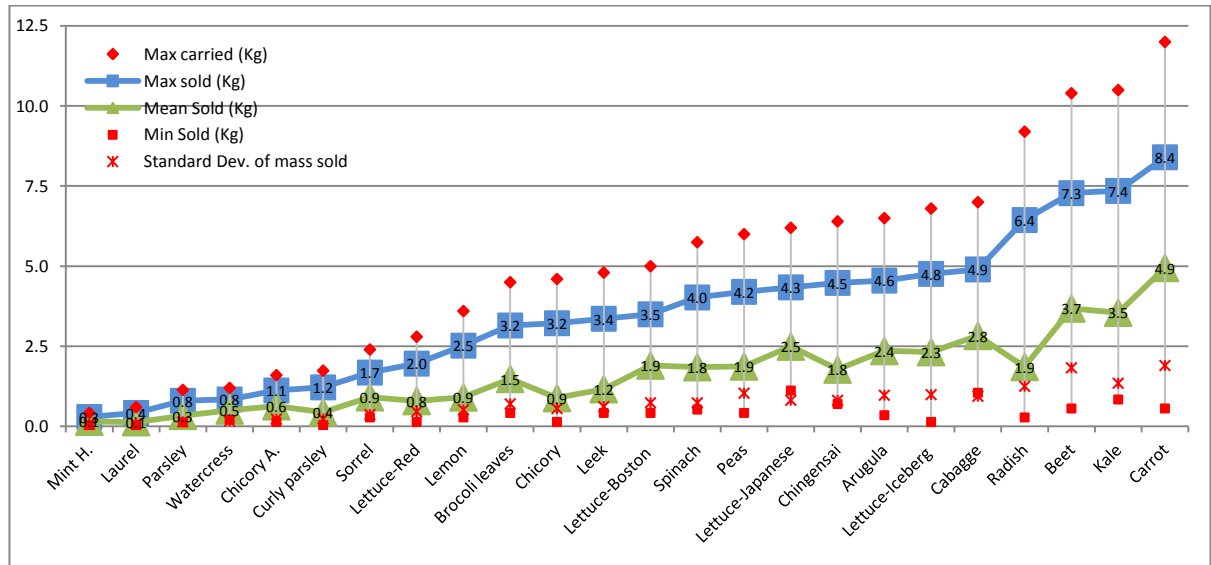
**Graphic 15. Proportion of crops from Nova Friburgo that were sold in 2011 which have met sale expectations from 25% onwards by weekly number of units delivered in organic farmers markets.**

Conventional farmers markets are also part of the sale points where organic products are sold in NF (**Graphic 16**). There are two of them where organic farmers commercialize their products, one of these points is considered by organic farmers as a potential place where an extension of CCFO will be open, in this regard, farmers from NF during the first semester of 2012 have been negotiating the



conditions to reopening of the organic farmers market; the same one that had stopped its functions in 2011 and had been a tradition in NF in the last two decades.

From the total amount of products sold at conventional farmers markets (51 crops), 24 crops represent 83% of total volume which was sold in 2011. They also represent 47% of the crop diversity found at these sale points. Those 24 crops were commercialized along 7 to 9 months of the year. The **Graphic 15** is showing the offer of products sold through this value chain; this graphic also can be used as a tool for decision making about the amount of products that could be weekly managed at these markets.



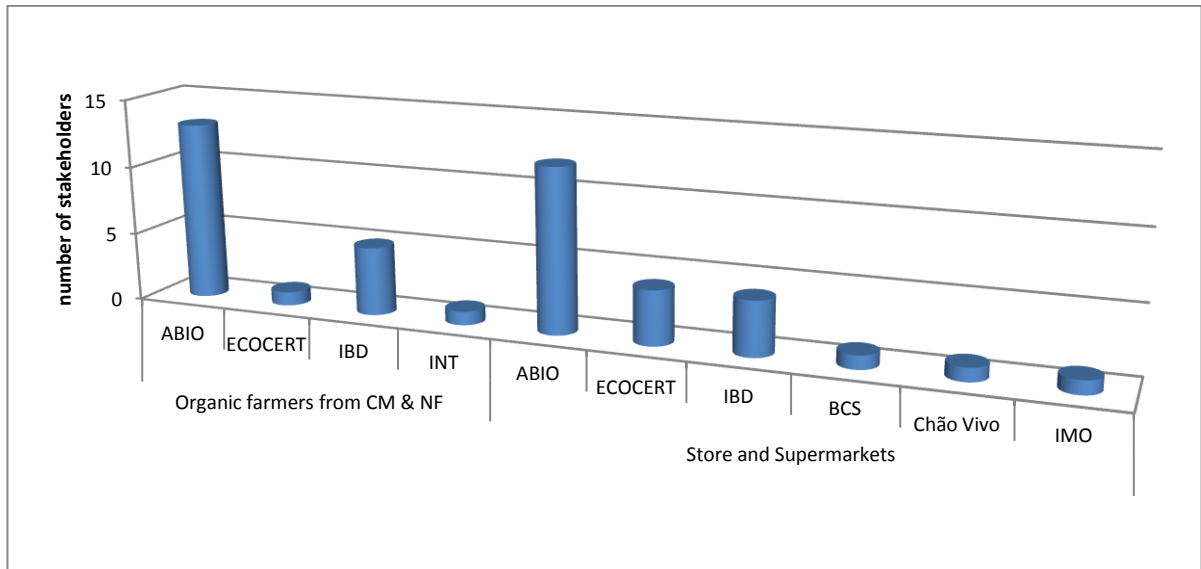
**Graphic 16.** Weekly variability in the offer of the most traded organic products from Nova Friburgo which have been commercialized at conventional farmers markets in 2011, based on weight of organic crops.

### 3. Types of conformity assessment bodies existing in the municipalities under study (organic seals). Seals held by farmers and those found at Farmers markets and Permanent Stores and Supermarkets (PSS).

The mechanisms of conformity assessment of organic production which are currently operating on these municipalities are described in **Graphic 17**, from this graphic we can conclude that ABIO is the leading seal, which is known for all 12 permanent sale points interviewed (Permanent Stores and Supermarkets-PSS-) in this research. ABIO also figures as the Participatory Conformity Assessment Body (OPAC) which covers all 13 Organic Farmers interviewed from these two municipalities. Nonetheless IBD is also an important seal which certifies 38% of Organic Farmers and is known by 33% of PSS. A smaller share of organic farmers of the municipalities under study, 8% is certified by ECOCERT, however this Organism of Certification by Audit (OAC) is known in the same percentage of sale points as is IBD.

These last two OAC represent the leading Certifiers by audit in the municipalities under study; nonetheless other certifiers like INT, BCS, Chão Vivo and IMO are gaining territory among organic farmers (**Graphic 17**).

Representatives of PSS have also mentioned that there are still many seals of organic agriculture which do not comply with the regulations required by the Brazilian Law of Organic Production. On the other hand many organisms that certify organic production are still in the process of covering the steps to be accredited as official certification bodies recognized by the Brazilian Government. Even when all organic farmers from the municipalities under study are currently working with ABIO, projects of Institutions of Public Private Partnership (PPP) are fostering the accreditation by audit to expand the opportunities of organic farmers to commercialize their products facing the coming international events that will befall in Rio de Janeiro.



**Graphic 17. Types and frequency of certification seals seen at all sale points where organic farmers from the municipalities under study sell their products and seals hold by farmers at both municipalities.**

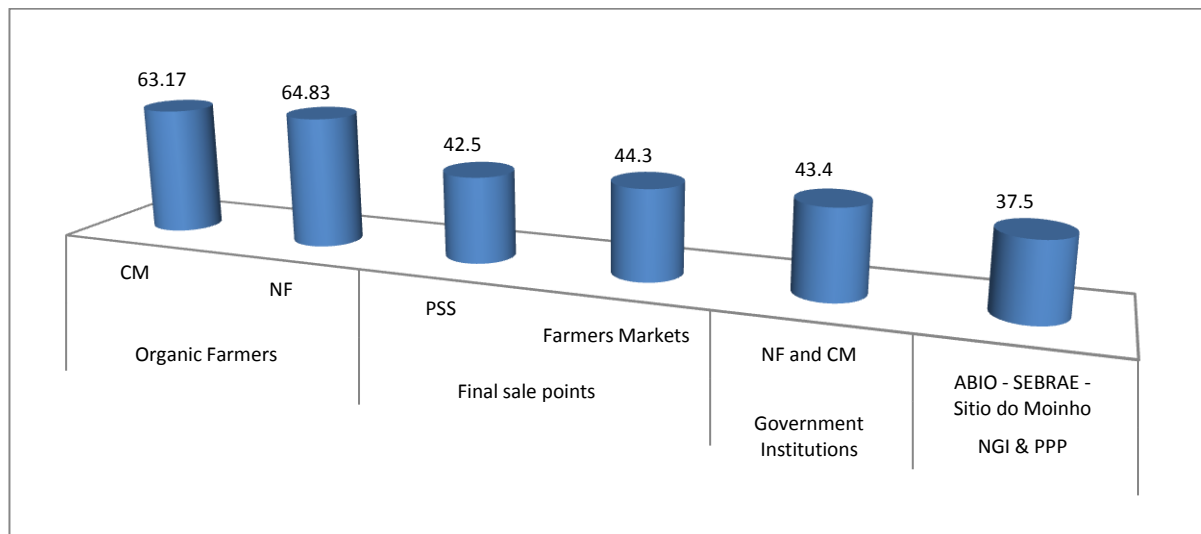
CM: Cachoeiras de Macacu; NF: Nova Friburgo

#### 4. Average age of the stakeholders involved in the value chain.

As it was described on the reference framework, the “neururais” were the people who started the movement of organic agriculture in Rio de Janeiro, most of them were propelled by ecological thoughts which flourished in the 1980s; this information correlates with the average age that was found in organic farmers, where house heads represent the oldest age group. However our study has detected that, commercialization processes are eagerly done for a new generation of Organic Farmers and, even though Organic Farmers have the highest value among all stakeholders, the fact that final commercialization points (PSS), Government Institutions, and NGI are represented by people that have lower age values show an scenario where enablers and supporters of organic value chains can execute long run strategies to benefit organic agriculture.

Between the municipalities under study, NF shows the highest value of age as is shown in **Graphic 18**. Nonetheless, it is in NF where organic farmers are closely working in a family-based structure which includes young people. Conversely, CM has a work relationship that generally involves hired labor to manage field activities or partnerships with other farmers, but does not involve the owner’s

family; therefore, NF has a comparative advantage regarding CM, with a new farmers generation who wants to continue the activity.



**Graphic 18. Average age of all the stakeholders involved on value chains at both municipalities under study.**

CM: Cachoeiras de Macacu; NF: Nova Friburgo; NGI: Non-Governmental Institutions; PPP: Institutions of Public Private Partnership; PSS, Permanent Stores and Supermarkets

## VIII. Discussion

### A. Main models of value chains existing in the municipalities under study.

Nova Friburgo had the first sale point of organic products in the State of Rio de Janeiro, this point was created in 1985; in Rio de Janeiro Gloria farmers market was for long time the only sale point available to commercialize organic products which was fostered by a jointly collaboration among the Biological Farmers Association of the State of Rio de Janeiro (ABIO) and the Harmony Environmental Association Coonatura-RJ (COONATURA) in 1994. Two years later, diversification of value chains started to appear with the introduction of organic products along supermarkets (Fonseca, Ribeiro, Siqueira, Machado, Silva, & Assis, 2011).

Since 1996, the evolution of different value chains in Rio de Janeiro has increased (**Graphic 18**) and in 2000 there were four major commercialization channels on the State, being one represented by the industries of processing and distribution which were leading the market with 70% of the total volume of organic products commercialized through them to small stores or supermarkets. the other three minor channels were constituted by: Permanent stores and supermarkets, a conventional Center of Sales and Distribution (CEASA) and five Farmers Markets across the State of Rio de Janeiro (Campos, 2001). Industries of processing and commercialization had also started to explore more commercialization channels afterwards such as home delivery baskets and restaurants deliveries. In this period we can identify six different value chains which by the name of the final sale point would be specialized stores, supermarkets, CEASA, farmers markets, restaurants and home

delivery baskets. Out of them the farmers markets were the only final point reached by organic farmers (**Graphic 19**).

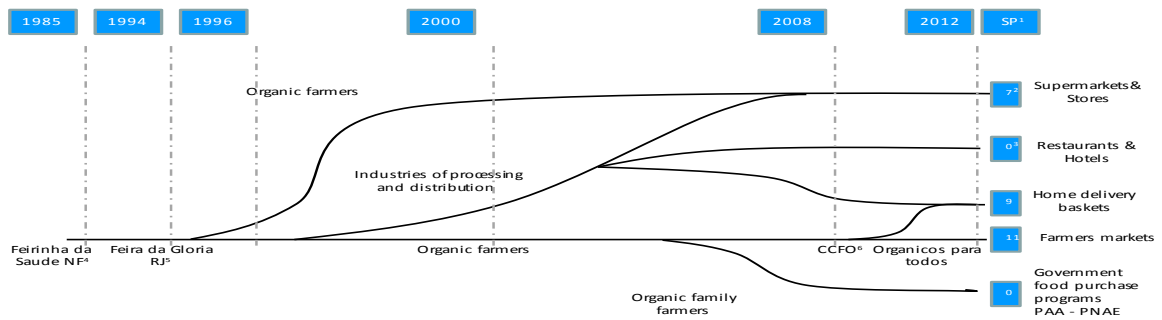
In 2009 farmers markets were distributing organic products through 19 fairs across Rio de Janeiro and 13 industries of processing and distribution were studied. A new chain, the governmental Food Purchase Program (PAA), had appeared even though it had a very low impact on organic farming, with only one contract signed at the end of 2008 with organic family farmers from Petrópolis (Fonseca M. , 2009b). These seven value chains have been constantly rearranging their path since then. The commercialization channels were strongly influenced by their certification agencies, and with the came into force of the regulations from the Brazilian Law of Organic Production, and the consequent shrinking or strengthening of institutions that now are known as the Participatory Conformity Assessment Bodies (OPAC) and the Conformity Assessment Organisms - Certification by Audit (OAC) (Feres, 2010) the enterprises which had a traditional market in Rio de Janeiro had to standardize processes and procedures to be recognized by the government as part of the Brazilian Organic Conformity Assessment System (SisOrg). The accreditation has been a filtering process for many industries of processing and distribution which had neither enough number of customers nor strong value chains to sustain their activity.

ABIO, the leading OPAC of organic agriculture in the State of Rio de Janeiro (Feres, 2010; Fonseca, Ribeiro, Siqueira, Machado, Silva, & Assis, 2011; Pereira & Martins, 2009) is still having a great comparative advantage over other seals because it also has created the Carioca Circuit of Organic Farmers Markets (CCFO) which helps to distribute organic products in a direct commercialization channel. These findings match those made by a recent investigation in which out of a national marketing research, ABIO was the third recognized seal nationwide from 71% of the interviewees that acknowledged organic seals. Thus, in a multiple choice question about organic seals, ABIO is recognized by 28% of the respondents who have also recognized in 47% of the cases the IBD seal and in 37% of the cases the seal of the SisOrg (Organic Services & Vitalfood, 2011).

In this research all final sale points have recognized ABIO's seal and all organic farmers were accredited by this organization. However, the Brazilian Service of Assistance to Micro and Small Enterprises of Rio de Janeiro (SEBRAE-RJ) is helping OACs to raise their number of certified organic farmers, with its project that supports organic certification which has helped in 2010 with 70% of the expenses generated in the inspection of 23 farmers from Nova Friburgo (NF) made by ECOCERT in order to accredit their production (Organicsnet, 2012b). Farmers who had still an organic certification for this research (either OAC or OPAC) have assured that nowadays SEBRAE-NF is promoting the accreditation by IBD. Those farmers have passed the inspections of this new OAC and are paying an amount of R\$ 150.00 to IBD for concept of annual accreditation required as farmer group. (Organicsnet, FORMULÁRIO ORGANICSNET IBD, 2012c). This accreditation cost is lower than ABIO's costs that go from R\$35.00 per month (to family farmers with one scope -**Annex 3**-) and change with the amount of scopes in which the farmer is inserted (ABIO, 2012). In Itapolis, organic farming required organization prior SEBRAE's technical training (Oelofse, et al., 2010), that is a reason why in the municipalities under study, farmers which wanted to work with SEBRAE had to have an ABIO certification prior joining the process of accreditation.

SEBRAE-RJ is also encouraging the creation of the Intelligence Center in Organics (CIOrg) (A VOZ DA SERRA, 2012; Organicsnet, Organicsnet, 2012a) which offers long term solutions for marketing

through data collection and management of organic production, as well as providing information about other industries involved on organic businesses that can increase the chances of farmers to create new partnerships and access new commercialization channels.



**Graphic 19. Value chains evolution in Rio de Janeiro and current sale points where farmers from the municipalities under study commercialize their products.**

<sup>1</sup>Sale points; <sup>2</sup>Here are considered only the NF sale points because the value chain of CM were studied just up to its commercialization with Sítio do Moinho; <sup>3</sup>Sítio do Moinho commercializes with this value chain, however the research was not conducted to determine the points where CM participates with its production. <sup>4</sup>Nova Friburgo; <sup>5</sup>Rio de Janeiro; <sup>6</sup>Carioca Circuit of Organic Farmers Markets.

ABIO's cores have been an important asset in group organization since it took the role as OPAC and started to form groups among their affiliates in order to comply the Participatory Guarantee System (SPG). This new strategy gives more tasks to the farmers, who are responsible for the approval of new members as well as regulation and control of the organic production according to the Law of Organic Production. This is a unique process because, even though SPG is recognized worldwide as an alternative certification mechanism of organic control, it is only Brazil that has a normative which includes SPG as an integrant part of its legal framework in the SisOrg.

As in the State vision, Nova Friburgo shows a pattern of expansion, exploration and specialization on various value chains since the “Feirinha da Saúde” was created in 1985 (Fonseca, Ribeiro, Siqueira, Machado, Silva, & Assis, 2011) This fact is visible because even when in 2009 the organic farmers were trading their products with several clients, Permanent Stores and Supermarkets (PSS), CEASA, restaurants, farmers markets and industries of processing and distribution (Pereira & Martins, 2009), the value chains which were found in this research are following three main models; those models are in close relationship with the models found in Cachoeiras de Macacu. However the value reached by different stakeholders through these chains is widely diverse and heavily depending on: farmers’ organization, network of institutional assistance and trust among different stakeholders. These two first points agree with the results provided by other investigation done in the field of market accessibility and outcomes after adoption of organic agriculture in China and Brazil (Oelofse, et al., 2010).

The main models of organic value chains found in the municipalities under study which correspond to the subsector of organic agriculture, named by the end market place are: PSS, Farmers Markets and Home Delivery Baskets. There is also in Cachoeiras de Macacu (CM) a value chain partially analyzed through which other main value chains (restaurants, hotels, PSS and home delivery baskets) are feed with organic products. These chains have particular characteristics which are discussed in the next points where are specified by each municipality under study, considering the factors which are influencing over the strengthening of one or another value chain.

### **1. Models of Cachoeiras de Macacu (CM) and its importance.**

The most complex model is the value chain which goes through Sítio do Moinho as industry of processing and distribution which commercializes with supermarkets, own store, restaurants, hotels and home delivery baskets. Even though the investigation was not able to collect enough data to visualize the whole value chain, the model of purchase which presents CM is similar as Shandong and Jilin in China, where the company agrees in provide technical assistance and purchase the production, whilst the farmers are responsible for following organic standards and guarantee timelines in products supply (Oelofse, et al., 2010). This model is identified with the model B -local middle-high income market- which aims at supermarkets, following national and sometimes international quality and safety standards (Kaplinsky & Morris, 2002)

In CM this company makes individual agreements of purchase and payment and is flexible about sizes of land owned by organic farmers, conversely; in Shandong the company works directly with the village cooperative to simplify the management of product delivery and in Jilin a large area and proximity to road access is a requirement to be a farm of this channel, therefore a strong organizational capacity is the main requirement to enter in this channel (Oelofse, et al., 2010). This is one of the reasons why a contract with Vivo Sabor Alimentação<sup>21</sup> could not be done in CM, because this company requires a minimum of production as well as the municipality representatives to manage the process of contract and the collection of organic products in a central point of the municipality.

Sítio do Moinho offers weekly production planning and provides technical assistance to organic farmers whose rules have to be followed by farmers and represent the agreement of purchase between them, without a contract; although farmers claim that this way of sell generates a gap of two to three weeks between product delivery and payment. In this context, Vivo Sabor Alimentação want to make a contract with a fixed value but with very low prices and leave to the municipality the responsibility of the collection of organic products from the farms. As we see this value chain is characterized by a bigger chain of stakeholders who have different approaches to organic farmers. This municipality is more likely to hold this value chain because of the geographic proximity to Rio de Janeiro; however it has more steps along the value chain and requires more management of logistics and production planning.

Home delivery baskets and farmers markets are value chains that basically have been working together, because the first one does not have a continuous supply of products and local demand is

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<sup>21</sup> Detailed information may be found at: <http://www.vivosabor.com.br/quem-somos.html>

too weak to establish a local delivery chain. Even though this value chain should offer the greatest return to farmers of CM, a vast variation on the expenses of: transport and commercialization gives negative returns for the farmer who collects and sells the products in Rio de Janeiro. In this case even when from 64% to 77% of the final price is taken by the farmer who does the commercialization, up to 100% can be absorbed by the issues stated above leaving no room for savings. In this case the farmer does not have a contract of purchase with ABIO, but farmers must cover weekly expenses of market management, the stand rent and divulgation which have reached in 2011 an amount of R\$ 25.00 (Fonseca, Ribeiro, Siqueira, Machado, Silva, & Assis, 2011), the same amount was required for weekly participation in the farmers markets of "Orgânicos para Todos"<sup>22</sup>. Those tariffs arranged by ABIO and "Orgânicos para Todos" to set up weekly farmers markets also increase the expenses of organic farmers, who usually need about R\$ 300.00<sup>21</sup> per week to cover the expenses above stated and their own expenses derived by farm processes. Therefore, the uncertainty of the amount of sales was mentioned by this group as potential threat of this value chain.

These facts have forced in early 2012 a shift in the person who delivers organic products at farmers markets. Despite these difficulties the analysis done shows that the best sale points are in "Orgânicos para Todos" which offer a small margin of return, while currently the Carioca Circuit of Organic Farmers Markets (CCFO), as is shown in **Graphic 16**, does not represent a good market for this farmers. There were no other analyses found in this matter to compare the results, because most studies have an approach which reports bulk income or bulk weight of organic products.

## **2. Models of Nova Friburgo (NF) and its importance.**

Farmers from NF have reached either for supermarkets, stores, home delivery baskets or farmers markets, a good internal group organization that allows them to go through all commercialization processes (considering supermarkets and stores as retailers), avoiding traders to maximize their revenue. In all cases, organic farmers or their workers have completed the steps of transformation and transportation which lead them to less losses due middleman; however, the amount of products that are having nowadays and the extension on logistic management is giving signs of possible failures due to management of products distribution.

Supermarkets and specialized stores are considered as one single value chain due to the fact that they are managed by the same farmer, these final sale points are considered as a secure place where products can be shown for a longer period of time than farmers markets. This value chain leaves a high share of final value to the farmer considering that transportation and distribution are minimized for local delivery. In comparison with values assessed in 2000 and 2001 where farmers had received just 20% to 30% of the total price paid by customers (Fonseca, Almeida, Colnago, & Silva, 2009a; Feres, 2010), this research shows estimations considerable higher which go from 54% to 73% of the final value prices of organic products commercialized through this value chain. However, the information from 2000 and 2001 does not specify how many steps have the products

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<sup>22</sup> Martelleto, R., personal communication, May 29, 2012

gone through before reaching the final retailer, those steps are two in this research, transformation and transportation; which are executed by the farmer.

Also, we may consider that, contracts between suppliers and supermarkets are not common; since only 22% of the producers of vegetables and fruits have a contract, while a large majority (68%) has never made one (MAPA, 2007). Those results are confirmed by the investigation, because to the question of whether final sale points make a contract or not, managers answered that their buying strategy is the purchase at the PSS which was not identified as a contract. The farmers explained that this condition consist of a limited amount of days (from 5 to 8) given by the PSS to show the products, after which farmers have to replace the products that were not sold with extra products and put the new assortment for a new period. This means that PSS give permission to farmers to expose their products on their stands, the products have to be ready (**Annex 14**) with the price already fixed. The farmers mentioned that time for payments in this value chain is very variable; from one week up to 75 days after the products are sold. Despite late payment most of the farmers from NF consider PSS as an important value chain because, as one farmer stated: “there are seven continuous days to show the products, while in farmers markets it is just one day a week”.

Farmers markets are the most important value chain for farmers in NF (**Graphic 4**). They occasionally bring with them home delivery baskets for consumers in Rio de Janeiro together with market products. Most of the farmers who belong to this ABIO core commercialize their products through this chain which delivers 60% of the final product price to organic farmers, this amount was fixed after several adjustments which have taken into account aspects like: possible driver payments, car depreciation, fuel, and commercialization costs. However with an increasing production, the most likely scenario is to check for readjustments that are needed in order to balance the rising capacity of the markets with the price that farmers are receiving; even though distribution and logistics management would be also an investment that needs to be considered because there are markets that have taken more than the expected capacity, unbalancing products distribution.

The 30% of the total share taken up by farmers who commercialize products at CCFO (40% of the final price -**Graphic 13**-) is used in fuel and tolls, while as we said before for farmers of CM this item can constitute up to 100% of their total expenses. This comparison is reflecting the variation of knowledge about the market and its variables owned by farmers from these two municipalities, therefore it would be important to spread the knowledge of organic farmers from one municipality to the other.

For medium scale farmers, farmers markets are considered as a side market to put the excess of production while for most of them, this value chain represents a strong part of the income derived from this activity. That is one of the reasons why ABIO core in NF is aiming the reactivation of the organic farmers market which was closed because of the landslides catastrophe suffered in 2010 on the region. This new agreement would benefit all organic farmers of NF and probably might embrace the production from farmers of CM.

Finally, the value chain of home delivery baskets is a market that has already a great impact on the commercialization of NF organic farmers. In this mainly local market, the expectations have been increasing considerably due the fact that organic farmers have built in barely more than one year a continuous chain with two days of permanent home delivery where customers who have paid a base price can receive their products at home within a delivery radius of NF City and surroundings. There



are also other delivery baskets that have a longer time of existence which work together with deliveries at local PSS in NF.

In NF this is one of the most enthusiastic ideas, and farmers who work in association are planning to expand their territory, with a permanent distribution point in Rio de Janeiro. On this regard, many industries of processing and distribution had started their business finding customers on this line of home delivery, but in the process of legal adjustments many of them have disappeared<sup>23</sup>. As it was explained by her owner, Sítio do Moinho also started with home delivery baskets, “being today one of the most reliable chains of this business, because the consumers of this chain are very loyal”<sup>24</sup>.

In NF the value chain of home delivery baskets leaves 70% of the final price for farmers and 30% for transport, fuel and distribution. In the perception of farmers from NF this value chain has the second place of importance among all the others.

## **B. SWOT perception of value chains of organic products in the municipalities under study.**

At the present time, clearer regulations have allowed the accreditation of OAC and OPAC since December 2009 (Fonseca M. , 2009b). The scenario of organic business is now ruled by a set of tools which can be used by farmers, enablers and promoters of value chains in value chain upgrading. Thus, the Law of Organic Production has overcome a possible threat which had hampered organic production with different regulations not yet standardized (MAPA, 2007) that has constituted a constraint for the opening of new commercialization channels. ABIO in Rio de Janeiro has also helped to support small scale agriculture with the creation of CCFO that are working since January 2011 (Fonseca, Ribeiro, Siqueira, Machado, Silva, & Assis, 2011). Governmental food acquisition programs as PAA and PNAE are also potential value chains which may be assumed by farmers of the municipalities under study as a commercialization channel; finally institutional support of Public and Private organizations have been fostering organic agricultural practices among an always rising number of farmers.

However there are still obstacles that hinder a wider extension of organic agriculture across Rio de Janeiro, since this study has presented a list of issues considered by the stakeholders of the municipalities under study. Here we are going to discuss the most representative issues of the SWOT analysis, those that were mentioned by three or more stakeholders, which have been synthesized in **Chart 11**.

Farmers disorganization is one of the weaknesses identified by this research, that holds organic farmers away from achieving new markets or generating joint production planning in order to meet market expectations, and in turn is reflected in small production and instable supply which coincides with findings of Fonseca, Almeida, Colnago, & Silva (2009) and MAPA (2007); this factor is especially important for farmers of CM who are just starting to plan their crops. This boundary induces a partial vision of the market where farmers identify a small volume of demand, even when the sales (as the study shows) have been increasing in the last year. Other investigations have identified that

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<sup>23</sup> Fonseca, M., personal communication, April 5, 2012

<sup>24</sup> Thompson, A., personal communication, June 1, 2012

the lack of farmers' organization for selling and a lack of knowledge of production costs at farmers markets are difficulties to overcome to enhance organic products commercialization (Fonseca, Almeida, Colnago, & Silva, 2009a; Valarini & Menezes, 2007).

Labor scarcity was one of the major bottlenecks for farmers of NF in 2008, however within the cluster of farmers who have other rent this was not the main problem (Pereira & Martins, 2009). In this research, labor scarcity is one of the weaknesses identified by most stakeholders; nonetheless we have to consider that in this investigation it was found that all certified farmers in CM and five of seven from NF have other income source not related with organic agriculture.

The poor access to information of organic products marketing was also one of the common weaknesses, which is consequence of scarcity on logistics management. This is a sensitive point that needs to be addressed by different organizations, because in order to have that access enablers and supporters working in this field have to share information to feed farmers decision making processes. In the process of provide and generate information of commercialization, it would be very important also to coordinate actions towards technical assistance that is other common point of interest seen as a weakness because in the municipalities under study exist just a "hand full" of professionals trained in organic agriculture, and farmers face the unbalance existing between professionals who provide technical assistance for conventional agriculture and those who would provide it for organic farmers; as one farmer pointed out "conventional agriculture has many technicians that go to the field while we need to think and solve our problems by ourselves". On this regard, the SPG fostered by ABIO's cores can be a crucial tool for debate and solutions finding if public institutions follow the process, however, we need to be aware that promoters of value chains have to analyze whether the solution is addressing a sensible part of the population or not in order to spend resources for helping organic farmers.

The poor awareness of organic agriculture among potential consumers is the most widespread threat for the system of production, commercialization and consumption of organic products, followed by high cost of transportation. According to managers of farmers markets, these are variables that may be balanced by government institutions in order to propel organic agriculture at least at the beginning. Nonetheless this investigation found that both municipalities were offered a vehicle to transport their organic products, but in NF was never used and in CM the quantity of products, by the time the help was asked were so small that did not justify the use of the municipality's truck.

About public awareness 44% of people interviewed in a national survey have declared that had enough knowledge about organic production and 84% of them knew other people who consume organic products. This showed a compact niche of organic products, with 52% of people buying at supermarkets as favorite place and 33% at organic farmers markets which are the sale points that hold the highest index of customer satisfaction (Organic Services & Vitalfood, 2011). These findings would justify greater investment on media broadcasting to promote organic farming.

Market access is also a crucial point for stakeholders because even when a market is reached, the payment arrangement can represent a barrier for permanent supply, as we saw earlier, supermarkets as well as industries of processing and distribution have a range of payment that goes from days until weeks, representing a constrain for small farmers who rely on the payments to continue with the activity. This was one of the reasons to stop the commercialization of farmers

from CM with “Fazenda Valle das Palmeiras” since payments were taking too long to continue with the investment<sup>25</sup>. The affirmation on that “the geographic position of a company or value chain may impact its competitive position” (Trienekens, 2011) is affecting both municipalities because the high cost of transportation and poor know-how on production management are threats that affect commercialization, mainly CM where expansion unto other markets are now dependent on management of commercialization costs, knowledge that may be provided by NF that has already overcome this issue.

Even when group disorganization is a weakness that goes through all fields of organic production, the organization for selling is clearly perceived as opportunity to overcome problems and the farmers have considered that with constant production may be easier to reach new available value chains. This process has been improved with the transition of ABIO from a certification agency to an OPAC, because the mechanism used for accreditation of conformity assessment is based on SPG that enrich the process of participation and exchange of ideas as is recognized by many farmers in both municipalities.

The process of commercialization would be improved also through strengthening of local markets; an example of this is the constant search of new markets, the reopening of the organic farmers market in NF as well as a proposal to join efforts and open a local sale point in CM, as was discussed in one of the meetings held among organic farmers and public institutions in this municipality. Furthermore, other stakeholders have proposed the idea of a total differentiated market, the creation of a Center of Sales and Distribution (CEASA) only for organic products. Even though the last idea is still a very weak opportunity, the fact of being shared by at least three stakeholders gives us an idea of the expectations generated by organic farming in the municipalities under study.

The stakeholders consider that strengths nowadays are represented by: family health and family income. Health of humans is also related with health of environment, because even when they recognize that production has decrease in the transition to organic agriculture, many stakeholders consider that soil fertility is improved with the use of organic agricultural practices In terms of health, organic farmers who have made the transition from conventional agriculture; found that pesticides have a direct impact on health and organic practices avoid headaches and other symptoms that were related to the use of pesticides. Regarding the income, nonetheless some farmers from NF considered that the payments related to organic agriculture are just enough to pay occasional workers, but not enough to make a living with it; and most farmers of CM believe that organic agriculture is an entertainment in their retirement, the family income is a matter that goes beyond owners because organic farmers have since 1 up to 9 workers constantly on the farm and some occasional workers depending on the activity. This shows that at least those permanent farmers which are usually represented by family heads support the whole family or provide an important share of total family income.

The creation of CCFO for farmers of NF and the subsequent generation of “Orgânicos para Todos” in the case of CM have opened final sale points that are certainly helping organic farmers to anchor a new value chain. This channel is also strengthening organic production since customers can find at farmers markets affordable products that are less expensive than those found at supermarkets,

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<sup>25</sup> Ferraz, P., personal communication, June 1, 2012

consequently the actions taken by administrative organizations are strengthening the dissemination of organic agriculture through Rio de Janeiro as a whole.

**Chart 11. SWOT analysis and possible strategies to improve current scenario, based on points shared by three or more stakeholders from the municipalities under study.**

Stakeholders' common points on SWOT analysis	Strengths	Weaknesses
Organic Farmers from both municipalities Government Institutions Non Governmental Institutions (NGI) Farmers Markets Permanent Stores and Supermarkets (PSS) Institutions of Public Private Partnership (PPP)	Approval of CCFO-RJ Exchange of information through SPG Family health Family income Fair price in comparison to supermarkets Institutional administrative organization Keeping soil fertility	Group disorganization Labor scarcity Lack of technical assistance Poor logistic management (selling communication, inventory) Small production and instable supply of organic products Lack of production planning in group Poor access to information of Organic products marketing Small volume of demand The prices are still high to reach a broader audience
Opportunities	Short term strategy	Medium term strategy
Farmers organization for selling Closer sell point Creation of a CEASA for organic products New potential commercialization channels	Support the process of potential new sale points (Suspiro, Laranjeiras) Stimulation of ABIO cores for exchange of information about marketing and production planning Include ideas of spreading organic agriculture to family farming through SPG Elaboration of base line indicators like: crops number, number of ha in production, yearly amount of sales, volume of sales, meet expectations, among others	Partnerships of marketing information exchange among stakeholders Training on effectiveness on production practices and reduction of production costs Lobbying to establish common local sale points together with local institutions Processing of organic products.
Threats	Medium term strategy	Long term strategy
Poor awareness and divulgation of organic agriculture among people High costs for transportation Late payments Limited market access	Strengthening of new Public-private partnerships Institutional support on logistics management to SPG Raising awareness on consumers through mass media Studies on particular value chains and its consequences	Education of organic experts Generation of programs for inter-state exchange of information among experts and other stakeholders Raising awareness of producers on Information Technology knowledge to foster fast communication

Possible strategies on how farmers may upgrade value chains are, in short term, keep on the process of reopening and strengthening the new sale points, promote the exchange of information through ABIO cores to share information about commercialization experiences and production planning. For this last objective, the generation of common indicators would be useful; in this regard this research aims to report useful data that may be used as base line of further research and value chains upgrading.

Medium term strategies should embrace new partnerships with SEBRAE-RJ with its initiative of the Intelligence Center in Organics (CIOrg), the Agricultural Research Corporation of the State of Rio de Janeiro (PESAGRO), the Embrapa Agrobiology - National Center of Agrobiology Research (EMBRAPA Agrobiologia), ABIO and the Agricultural Secretariat of the Municipalities of CM and NF, which can provide information on agricultural production, cost efficiency, and production management, as well

as the possibility of expansion of organic agriculture through programs that foster this activity among family farmers. In this last regard, the organic farmers could facilitate knowledge of past experiences and ongoing processes awareness to serve as farm field schools for other farmers. Farmers' organization should address issues as processing of organic products, for which can be useful to have specific studies about value chains. As medium term strategy and even as short term strategy would be also important the generation of partnerships to propel spread of organic farming through mass media.

The long term strategies should consider training on specific areas of organic agriculture to fill voids of technical assistance. It would also be important the raise of awareness on Information Technologies among farmers, as well as share of information across SPGs and/or organic certified farmers from different States. Those are possible strategies to follow among others that might be modified by continue planning and improvement.

### **C. Brazilian public and private institutions and its role on the upgrading of value chains of organic products in the municipalities under study.**

As we have mentioned in the last section, to confront current bottlenecks of value chains where farmers from CM and NF commercialize their products, there are some strategies to consider in short, medium and long term. Institutions of Public Private Partnership (PPP) that are part of the stakeholders who work in value chains of both municipalities may facilitate the path in the adoption of the above stated strategies.

Government institutions which have been consistently promoters of value chains in NF may take a role on spreading the benefits of programs and projects that are currently supporting organic agriculture. In this regard; just socialization of the potential benefits may bring considerable changes for organic agriculture, providing farmers with the knowledge of restrictions and possibilities for being involved in those programs.

Furthermore, to expand organic agriculture among other farmers, if it is considered as a policy that benefit family farmers, the existing groups of SPG (ABIO's cores) might serve as permanent farmer field schools that may act as teachers of the new farmers who want to follow sustainable practices while, at the same time enrich their process with other experiences. This exchange may establish long term investigations that also will consolidate a process of production planning for entrance in potential value chains which will be promoted with studies on specific crops and its value chains which would be necessary to better describe their boundaries.

Public private partnership institutions that are currently working on data collection and processing about bottlenecks of commercialization processes could be great agents of marketing training, production management as well as in Information Technology promotion, to enlarge farmers' awareness on sales and distribution of organic products. This will also improve constant supply of organic products in coming mega-events that would be an important asset for value chains of which are expected to be consistent in production and variety.

Non-Governmental Institutions (NGI) may improve coordination among stakeholders, enabling administrative support for SPG. Furthermore, they may also act as co-designers of farmer field schools as well as initiatives of upgrading to cover targeted groups and organic farmers. Lastly, Private Institutions currently working on organic agriculture may foster publicity and technical training, at least among farmers under their umbrella. These actions would benefit them attracting more partners to their business and at the same time to the whole community of organic stakeholders.

## IX. Conclusions

1. Organic farmers from the municipalities under study are involved on three main value chains of organic products which supply continuously: 9 permanent Home Delivery Baskets (all of them located in Nova Friburgo), 7 Specialized Stores and Supermarkets (all of them located in Nova Friburgo), and 11 Farmers Markets (9 of them located in Rio de Janeiro and 2 in Nova Friburgo). Farmers from Cachoeiras de Macacu commercialize their products through: 4 Farmers Markets (1 part of Carioca Circuit of Organic Farmers Markets and 3 part of “Orgânicos para Todos”) and 1 Industry of Processing and Distribution (Sítio do Moinho) which supplies: Supermarkets, own Stores, Hotels and Restaurants of Rio de Janeiro. Farmers from Nova Friburgo commercialize their products with: 7 Farmers Markets (5 part of Carioca Circuit of Organic Farmers Markets and 2 conventional farmers markets), 7 Specialized Stores and Supermarkets (5 supermarkets and 2 specialized stores) and 9 permanent Home Delivery Baskets (7 linked to supermarkets and specialized stores where consumers go to pick up their products and 2 Home delivery baskets).
2. The weaknesses perceived by most stakeholders are lack of technical assistance, small production and instable volume of organic products. The major threats were characterized by high transportation costs and poor awareness of organic agriculture among potential consumers. The Carioca Circuit of Organic Farmers Markets was perceived as the most important strength for most stakeholders, and the organization of farmers as the most important opportunity for sales enhancement.
3. Most of the organic vegetables commercialized through the identified value chains come from Rio de Janeiro. However there are great variations in the case of fruits and, generally most of the processed organic products come from outside the State. The quality characteristics of the top sale products are divided into freshness (in the case of vegetables and legumes), the intrinsic value of being pesticide free products, and their appearance. Other factors as labeling, sanitation of the products, and variety are also important. This last one especially at farmers markets in which are added the fair price of products, easiness of traceability and recovery of traditions, as other important features that need to fulfill organic products to be top sales.
4. State government institutions working with organic farmers in the municipalities under study are: Municipal Secretariat of Agriculture of Cachoeiras de Macacu, Municipal

Secretariat of Agriculture of Nova Friburgo, EMATER offices located in each municipality and PESAGRO with a regional office in Nova Friburgo. Federal institutions are represented by EMBRAPA Agrobiologia with a regional office in Nova Friburgo. SEBRAE-RJ is a public private partnership institution which is also working with organic agriculture that has a regional office in Nova Friburgo. In Cachoeiras de Macacu a common partnership in issues related with organic agriculture have been held among the Secretariat of Agriculture, SEBRAE-NF and EMATER-CM with joint projects as PAIS, organic training, among others, while in Nova Friburgo two groups emerge, one shaped by the Secretariat of Agriculture and SEBRAE-NF which had promoted as in Cachoeiras de Macacu, programs that foster organic agricultural practices. The other group is shaped by PESAGRO and EMATER-NF who are working on the research of the applicability of SPG, and now with the Secretariat of Agriculture on the reopening of the local farmers market.

5. ABIO is the leading Participatory Conformity Assessment Body (OPAC) which accredits organic production through Participatory Guarantee Systems to 14 farmers in the municipalities under study (7 from Cachoeiras de Macacu and 7 from Nova Friburgo); IBD is the leading Conformity Assessment Body - Certification by Audit (OAC) which certifies 5 of the farmers who are accredited by ABIO (2 from Nova Friburgo and 3 from Cachoeiras de Macacu). The certification of IBD is promoted by SEBRAE which has contracted IBD to certify organic farmers in 2012 to enhance the scope of organic agriculture. Other Conformity Assessment Bodies are also certifying one farmer in Nova Friburgo (INT) and one in Cachoeiras de Macacu (ECOCERT).
6. The focus of value chains needs is moving from identification of commercialization niches to production planning of organic crops. Thereby, the approval of the law and regulations of organic agricultural production since 2003 has been strengthening traditional value chains (as farmers markets, home delivery baskets as well as supermarkets and specialized stores) and opening new value chains (as food acquisition programs like PAA and PNAE). However contracts with final sale points are not yet common because the production instability and discontinuous supply are still part of the bottlenecks to overcome.
7. Representatives of EMATER and Municipalities from our case study have the responsibility of communicate the benefits of programs and projects that are currently available for organic agriculture. Nonetheless most of them are not suitable for organic farmers since most of them do not depend on agriculture as a strong source of income; this situation makes them not feasible to be accredited as PRONAF users, which is the basic requirement for DAP obtainment being this last point the entrance card for most of the public programs fostered by the government.
8. Upcoming mega-events are an enormous opportunity for organic agriculture, this is a fact recognized by SEBRAE that has just started a project of data collection and processing to organize suitable information which favors companies as well as farmers to promote reliable partnerships and alliances towards the events mentioned above. Sítio do Moinho is also encouraging farmers' participation in its supply of products towards markets of Rio de Janeiro, increasing continuously its demand.

9. Participatory Guarantee Systems are for the municipalities under study the engines of exchange of information and knowledge among organic farmers; those systems also are shaping ABIO's cores which are permanent working groups that could be used in spreading organic agriculture to family farmers that are not yet aware of sustainable practices.
10. Farmers of Nova Friburgo, are receiving from 54 to 73% share of the final value in according to estimates made for supermarkets and specialized stores, while the range varies from 60% to 70% by farmers markets and home delivery baskets. The farmers perceived that the lack of technical assistance is the biggest disadvantage in the system of production, commercialization and consumption of organic products. The scenario in Cachoeiras de Macacu shows that farmers received in 2011 from 23% to 36% share of the final value at farmers markets. The farmers from the latter municipality have found that the transport issues are the hardest to face on the system of production, commercialization and consumption of organic products.
11. The municipalities under study hold a wide variety of crops, represented on: 104 crops sold by farmers of Cachoeiras de Macacu on organic farmers markets in 2011 (18 of which were exchanged at farmers markets), 86 crops sold by farmers of Nova Friburgo on organic farmers markets in 2011 and 51 crops sold by farmers of Nova Friburgo at conventional farmers markets in the same year. A continuous track of these and other indicators collected by this research will provide to the decision makers enough tangible elements to help processes of value chains promotion and upgrading as well as to propel farmers' understanding about their production planning and their production costs.
12. The demand and offer of organic products is raising in both municipalities, this research have found an increase of 4.65 times in volume sold at farmers markets corresponding with data provided by a farmer of Nova Friburgo and an increase of 4.17 times in volume sold to Sítio do Moinho with data provided by a farmer of Cachoeiras de Macacu in the first four months of 2012 in comparison with the previous year.

## X. Recommendations

1. The presented value chain analysis from the municipalities under study has collected information from production up to the final sale in most value chains. However for a deeply understanding about future upgrading possibilities for organic farmers, a larger analysis will be required which considers all inputs involved in the system of production, commercialization and consumption of organic products. This information will allow us to model different scenarios of upgrading potential.
2. The results of Strengths, Weaknesses, Opportunities and Threatens that were presented in this research have to be discussed among all stakeholder representatives in order to prioritize actions that may help the gradual development of organic agriculture of the municipalities under study.



3. A complete characterization of the banana value chain in Cachoeiras de Macacu would produce short term strategies for chain upgrading, since most organic farmers of this municipality rely on this crop. For Nova Friburgo a closer analysis will be required on those crops that have covered at least 25% of expected volume of production in 2011. This analysis should address weak points, and at the same time; should remark the opportunities for alternative markets or changes in production.
4. The construction of long term research on transition towards organic practices with family farmers could increase the participation on alternative governmental value chains as PNAE and PAA; because nowadays most organic farmers from the municipalities under study are not able to achieve such markets due to the fact that most of them do not rely just on agriculture for their income.
5. Participatory Guarantee Systems present on the municipalities under study may work as research groups where farmers who want to achieve agroecological and organic practices can nourish from their experience of failures and success, however this coordination must be facilitated by public organisms if they find that this alternative meets governmental interest.

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## XII. Annexes

### Annex 1. Evolution of the decision making process on Legislative and Executive powers to regulate organic agriculture in Brazil.

Year	Legislation
1994	Ordinance SDA/MA – Portaria No. 178, August 1994 - Special Commission to propose Norms and Certification for organic products.
	Ordinance SDA/MA – Portaria No. 190, September 1994 - Creation of the National Committee of Organic Production / Criação do Comitê Nacional de Produtos Orgânicos ( <b>CNPOrg</b> ) to propose strategies for organic products certification.
1995	Ordinance SDA/MA – Portaria No. 192, April 1995 - Nominate members to compose the CNPOrg
1996	Law Project (Projeto de Lei) - PL No. 1957/96 - Brazilian Congress - Deputy Valdir Colatto.
1998	Ordinance SDA/MA – Portaria No. 505, October 1998 - Treats the production, processing, packaging and transport of organic products (public consultation for 90 days).
1999	Normative Instruction SDA/MA – IN No. 007 May 1999 - Treats the production, processing, packaging and transport of organic products.
	Law Project (Projeto de Lei) – PL No. 659-A/99 - Brazilian Congress - Deputy Murilo Domingos (to substitute PL n. 1957/96), passed by The Rural Policy Committee (in November 2000, rapporteur Deputy Carlos Batata), after The Justice and Constitution Committee.
2000	Ordinance SDA/MAPA – Portaria No. 42, November 2000 - Designates the members to compose the CNPOrg.
2001	Ordinance SDA/MAPA – Portaria No. 19, April 2001 - Guidelines for the internal regulations of both the CNPOrg and the Organic Production Committees at every Federation Unit ( <b>CPOrg-UF</b> )
	Ordinance SDA/MAPA – Portaria No. 17, June 2001 - Establishment of the criteria for accreditation of the organic products certifiers (public consultation for 30 days).
2002	Normative Instruction SDA/MAPA – IN No. 006, January 2002 - Establishment of the criteria for accreditation of the organic certifiers.
	Law Project (Projeto de Lei) - PLC No. 14/02 (659 origin) - Senate - Commission of Economic Affairs, after by the Commission of Social Affairs - rapporteur Senator Aelton de Freitas (PL/MG) in June, 2003.
2003	Law Project (Projeto de Lei) - PL No. 659 - Deputy Chamber - Commission of Environment and Consumer Defense - Rapporteur Deputy Edson Duarte (PV/PA) - Approved under agreement by the National Congress in Plenary in November 27, 2003.
	Law (Lei) 10.831, December 23, 2003, Presidency of Brazil, published at DOU in December 24, 2003 - Provisions for the Organic Agriculture and other measures.
2007	Decree (Decreto) No. 6323, Presidency of Brazil, December 27 2007 - Regulates the Law 10.831, December 23, 2003. Provisions for the Organic Agriculture and other measures.
2008	Normative Instruction MAPA – IN No. 54, October 22, 2008 - Regulates the structure, composition and attributions as well as the guidelines for the internal regulations of the CPOrg-UF.
	Normative Instruction MAPA – IN No. 64, December 18, 2008 - Approval of the Organic production technical Regulation systems: vegetable and animal.
2009	Joint Normative Instruction (Instrução Normativa Conjunta) MAPA/MMA – IN No. 17, May 18, 2009 - Approval of the technical norms for the obtainment of organic products from organic sustainable extractivism.
	Joint Normative Instruction MAPA/MS – IN No. 18, May 28, 2009 - Approval of the technical regulations for processing, storage and transportation of organic products.
	Normative Instruction MAPA – IN No. 19, May 28, 2009 - Approval of the information and control mechanisms of the organic quality.
	Decree (Decreto) of the Presidency of Brazil No. 6913, July 23, 2009 - Additions to the Decree No. 4074, January 4, 2002 of regulation over the Law No. 78802, July 11, 1989; provisions about the approved phytosanitary products in the organic agriculture.
	Normative Instruction MAPA - IN No. 50, November 5, 2009 - Institutes the unique official seal for the Brazilian Organic Conformity Assessment System ( <b>SisOrg</b> ) and establishes the requisites for its use in the organic products.
	Decree of the Presidency of Brazil No. 7048, December 23, 2009 - New edition of the Article 115, establishing December 31 of 2010 as the deadline to adapt to the rules of Decree No. 6323, December 23, 2003; provision for organic agriculture.
2011	Normative Instruction MAPA/MS – IN No. 24, June 1, 2011 - Additions and modification to the IN No. 18, May 28, 2009, which establishes the Technical regulations for processing, storage and transportation of organic products.

Year	Legislation
	Normative Instruction MAPA - IN No. 23, June 1, 2011 - Establishes the technical regulations for organic textile products, derivatives from cotton.
	Normative Instruction MAPA - IN No. 21, May 11, 2011 - Revokes the IN No. 16, June 11, 2004.
	Joint Normative Instruction SDA/SDC - MAPA – IN No. 02, June 2, 2011 - Establishes reference specifications of phytosanitary products approved for organic agriculture use.
	Joint Normative Instruction SDA/SDC-MAPA/ANVISA/IBAMA – IN No. 01, May 21, 2011 - Establishes the procedures to register phytosanitary products with approved organic agricultural uses.
	Interministerial Normative Instruction MAPA/MPA – IN Interministerial No. 28, June 8, 2011 - Establishes the technical norms for the organic aquaculture production systems.
	Normative Instruction MAPA - IN No. 37, August 2, 2011 - Establishes the technical regulations for the production of eatable mushrooms in organic production systems.
	Normative Instruction MAPA - IN nº 38, August 2, 2011 - Establishes the technical regulation for seeds and seedlings production in organic production systems.
	Normative Instruction MAPA - IN nº 46, October 6, 2011 - Establishes the technical regulation for animal and plant organic production systems as well as the lists of allowed substances for use in those systems.
2012	Joint Normative Instruction SDA/SDC - MAPA – INC No. 03, May 11, 2011 - Addition of Annex III to the Joint INC SDA/SDC No.2, June 2, 2011, showing the reference specifications to theof phytosanitary products approved in for the organic agriculture use.

Sources: Fonseca (2009) ; MAPA, Prefiraorganicos (2012); IAPAR (2012) – Organic Agriculture Legislation, available in <http://www.iapar.br/modules/conteudo/conteudo.php?conteudo=1629>, accessed in July 31, 2012. (Instituto Agrônômico do Paraná – IAPAR)

## Annex 2. National Cadastre of Organic Producers; by the corresponding mechanism of conformity assessment. 2011

Mechanism of conformity assessment	Entity	Location (States)	Total of certified units in 2011
Participatory Conformity Assessment Body (OPAC) - Participatory Guarantee Systems (PGS)	ASSOCIAÇÃO DE AGRICULTURA NATURAL DE CAMPINAS E REGIÃO – ANC	São Paulo	47
	ASSOCIAÇÃO ECOVIDA DE CERTIFICAÇÃO PARTICIPATIVA – REDE ECOVIDA	Rio Grande do Sul	754
	ASSOCIAÇÃO DOS AGRICULTORES BIOLÓGICOS DO ESTADO DO RIO DE JANEIRO- ABIO	Rio de Janeiro	62
	ASSOCIAÇÃO BRASILEIRA DE AGRICULTURA BIODINÂMICA-ABD	São Paulo	
Conformity Assessment Organisms - Certification by Audit (OAC) – External corporative certification	INSTITUTO DE TECNOLOGIA DO PARANÁ-TECPAR	Paraná	58
	ECOCERT BRASIL CERTIFICADORA Ltda	Santa Catarina	3949
	IBD CERTIFICAÇÕES LTDA	São Paulo	4600
	IMO Control do Brasil Ltda.	São Paulo	2630
	Agricontrol LTDA (OIA)	São Paulo	95
	INSTITUTO NACIONAL DE TECNOLOGIA (INT)	Rio de Janeiro	
	INSTITUTO CHÃO VIVO DE AVALIAÇÃO DA CONFORMIDADE	Espírito Santo	
Social control organizations (OCS) for direct selling	Organic farmer cooperatives registered at MAPA	Brazil	79*
Total Mechanisms for monitoring and assessment of the organic quality		Brazil 2011	12274

Source: Own construction. Based on: A. Sudo, personal communication, April 2, 2012

\*Number of OCS registered until January 2012

### Annex 3. Interview for: Organic Farmers

#### (1 of 3, Annex 3)

Nome interessad@														Idade											
# Membros da família	♂		Adultos												Quantos trabalhadores	♂									
	♀		< 18													♀									
<b>(1) Cult. de plantio &amp; escopo</b>														J	F	M	A	M	J	J	A	S	O	N	D
A																									
B																									
C																									
D																									
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L																									
M																									
N																									
O																									
<b>(2) Comerc. / coleta / preço</b>														J	F	M	A	M	J	J	A	S	O	N	D
A																									
B																									
C																									
D																									
E																									
F																									
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H																									
I																									
J																									
K																									
L																									
M																									
N																									
O																									

(3) Desde quando você é produtor orgânico, e porque escolheu esta profissão?

#### (2 of 3, Annex 3)

(4) Critérios para ser escolhido como um produtor orgânico cadastrado no MAPA

Tipo de certificação	CO Certificado Orgânico	.	Nome da certificadora / OPAC	
	SPG Sistema Participativo de Garantia	.		
	VD Venda Direta	.		

(5,6) Quais são as oportunidades e os pontos fracos que os agricultores familiares orgânicos enfrentam para ingressar numa cadeia de valor orgânica?

		Valor	Porque
Pontos positivos: fora e dentro	Organização		
	Renda familiar		
	Rendimentos		
	Fertilidade do solo		
	Habito alimentar		
	Acesso a mercado		
	Investimento (maq.)		
	Recurso (gente)		
	Preço dos produtos		

		Valor	Como
Pontos negativos: fora e dentro	Organização		
	Volume/Quantidade de fornecimento		
	Continuidade oferta		
	Conhecimento técnico		
	Logística		
	Transporte		
	Assistência técnica		
	Falta de mão de obra		
	Acesso ao mercado		
	Tecnologia		
	Políticas públicas		

(7) Papel de políticas (nome do programa ou projeto)

		Valor	Qual
As políticas ajudam a os produtores orgânicos com	Custo administrativo		
	Custo de produção		
	Distribuição		
	Treinamento		
	Acesso a crédito		
	Certificação / Aval. da conformidade		
	Acesso a mercado		
	Pesquisa		
Assessoramento e Extensão Rural			



**(3 of 3, Annex 3)**

(8) Quais são as características dos produtos orgânicos, que são na sua maioria negociados no mercado regional e local, e quais são as razões para serem os mais comercializados?

		Valor	Porque	Como
Caract. dos produtos orgânicos	Durabilidade			
	Confiança dos clientes			
	Preços baixos			
	Volume/Quantidade			
	Rotulagem			
	Preços altos			

(9) Qual o relacionamento com os diferentes atores que intervêm na cadeia de valor?

		Valor	Como (local, RJ)	Quando
A relação é de	Venda direta	Prog. Governo		
		no Estabelecimento		
		Cestas a domicilio		
		Feiras		
		Distribuição		
	Indireta	Supermercado		
		Lojas produtos naturais		
		Exportação		

(10) Qual é o sistema de produção que você tem (escopo)?

Produção primária animal		Processamento de fitoterápicos	
Produção primária vegetal		Processamento de cosméticos	
Processamento de produtos de origem animal		Processamento de produtos têxteis	
Processamento de produtos de origem vegetal		Comercialização, transporte e armazenamento	
Processamento de insumos agrícolas		Extrativismo sustentável orgânico	
Processamento de insumos pecuários		Restaurante, lanchonetes e similares	

Valor	Cria problemas	Não cria problemas
	Muito bom	Muito ruim
	Importante	Não ajuda
	9	8
	7	6
	5	4
	3	2
	1	0

**Annex 4. Interview for: the Government Institutions and the Institutions of Public Private Partnership (PPP).**

**(1 of 2, Annex 4)**

Nome interessad@		Idade	
Instituição pública		Quantos trabalhadores	♂ ♀

(1,2) Quais são as oportunidades e os pontos fracos que os agricultores familiares orgânicos enfrentam para ingressar numa cadeia de valor orgânica?

		Exemplos	Valor	Porque
pontos positivos: fora e dentro	Organização			
	Renda familiar			
	Rendimentos			
	Fertilidade do solo			
	Habito alimentar			
	Acesso a mercado			
	Investimento (máq.)			
	Recurso (gente)			
	Preço dos produtos			

		Valor	Porque
Pontos negativos: fora e dentro	Organização		
	Volume/Quantidade de fornecimento		
	Continuidade oferta		
	Conhecimento técnico		
	Logística		
	Transporte		
	Assistência técnica		
	Falta de mão de obra		
	Acesso a mercado		
	Tecnologia		
	Políticas públicas		

(3) Papel de políticas (nome do programa ou projeto)?

		Valor	Qual / como
As políticas ajudam a os produtores orgânicos com	Custo administrativo		
	Custo de produção		
	Distribuição		
	Treinamento		
	Acesso a crédito		
	Certificação / Aval. da conformidade		
	Acesso a mercado		
	Pesquisa		
	Assessoramento e Extensão Rural		

**(2 of 2, Annex 4)**

(4) Que instituições estão oferecendo melhorias para este setor na região?

Instituição / Programa / Projeto	Ajuda

(5) Como se estabelece os mecanismos de avaliação da conformidade?

	Procedimento
Inspeção	
Visita de pares	
Medição	
Aproximação	

(6) Quais são os benefícios dos diferentes sistemas de avaliação da conformidade

Certificação	
Sistema participativo de Garantia	
Organização de controle Social	

(7) Outros aspectos importantes

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**Annex 5. Interview for: Farmers Markets and Permanent Stores and Supermarkets. (1 of 2, Annex 5)**

Nome interessad@		Idade			
Loja / Feira		Quantos trabalhadores	<table border="1"> <tr> <td> </td> <td> </td> </tr> </table>		

(1) Quais são as características dos produtos orgânicos, que são na sua maioria negociados no mercado regional e local, e quais são as razões para ser o mais vendido?

	Valor	Porque	Como
Caract. dos produtos orgânicos	Durabilidade		
	Confiança dos clientes		
	Preços baixos		
	Volumen/Quantidade		
	Rotulagem		
Preços altos			

(2) Tipo de produtos

	Quais & importância	Produtores que fornecem	
		Locais	Externos
Foliosas-h			
Raices-h			
Frutos, flores-h			
processados			
Frutas			

(3) Que tipo de certificado tem o produtor / fornecedor? A quanto tempo compra os productos?

Produtor	Fornecedor (loja / grupo / feira)

(4) Quais são as oportunidades e os pontos fracos que os agricultores familiares orgânicos enfrentam para ingresar numa cadeia de valor orgânica?

	Valor	Porque
Puntos negativos de fora e dentro	Organização	
	Volumen/Quantidade de fornecimento	
	Continuidade oferta	
	Conhecimento técnico	
	Logística	
	Transporte	
	Assistência técnica	
	Falta de mão de obra	
	Acceso a mercado	
	Tecnologia	
Políticas públicas		

**(2 of 2, Annex 5)**

(5) Quais são as oportunidades e os pontos fracos que os agricultores familiares orgânicos enfrentam para ingressar numa cadeia de valor orgânica?

	Exemplos	Valor	Porque
Pontos positivos: fora e dentro	Organização		
	Renda familiar		
	Rendimentos		
	Fertilidade do solo		
	Habito alimentar		
	Acesso a mercado		
	Investimento (máq.)		
	Recurso (gente)		
	Preço dos produtos		

(6) Qual é a estratégia de venda utilizada para os produtos orgânicos

	Valor	Porque
Lugares especiais na loja		
Rotulagem especial		

(7) Qual é a estratégia de compra utilizada para os produtos orgânicos?

	Valor	Porque
Compra na loja		
Consignação		
Contrato		

(8) Como se faz a entrega?

Direta	
Terceirizado	

(9) Outros aspectos importantes

--

**Annex 6. Interview for: Non-Governmental Institutions (NGI).  
(1 of 2, Annex 6)**

Nome interessad@		Idade	
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# Membros da instituição	♂		Adultos	
	♀		< 18	

Quantos trabalhadores	♂	
	♀	

(1, 2) Quais são as oportunidades e os pontos fracos que os agricultores familiares orgânicos enfrentam para ingressar numa cadeia de valor orgânica?

	Valor	Porque
Pontos positivos: fora e dentro	Organização	
	Renda familiar	
	Rendimentos	
	Fertilidade do solo	
	Habito alimentar	
	Acesso a mercado	
	Investimento (máq.)	
	Recurso (gente)	
	Preço dos produtos	

	Valor	Porque
Pontos negativos de fora e dentro	Organização	
	Volume/Quantidade de fornecimento	
	Continuidade oferta	
	Conhecimento técnico	
	Logística	
	Transporte	
	Assistência técnica	
	Falta de mão de obra	
	Acesso a mercado	
	Tecnologia	
	Políticas públicas	

(3) Papel de políticas (nome do programa ou projeto)

	Valor	Como
As políticas ajudam os produtores orgânicos com	Custo administrativo	
	Custo de produção	
	Distribuição	
	Treinamento	
	Acesso a crédito	
	Certificação / Aval. da conformidade	
	Acesso a mercado	
	Pesquisa	
Assessoramento e Extensão Rural		

**(2 of 2, Annex 6)**

(4) Que instituições estão oferecendo melhorias para este setor na região

Instituição / Programa / Projeto	Ajuda

(5) Como se estabelece uma área exata de certificação orgânica?

	Procedimento
Inspeção	
Aproximação	
Medição	
Outros	

(6) Que instituições ajudam ou impedem o processo de participação

Instituições	Como

(7) Outros aspectos importantes

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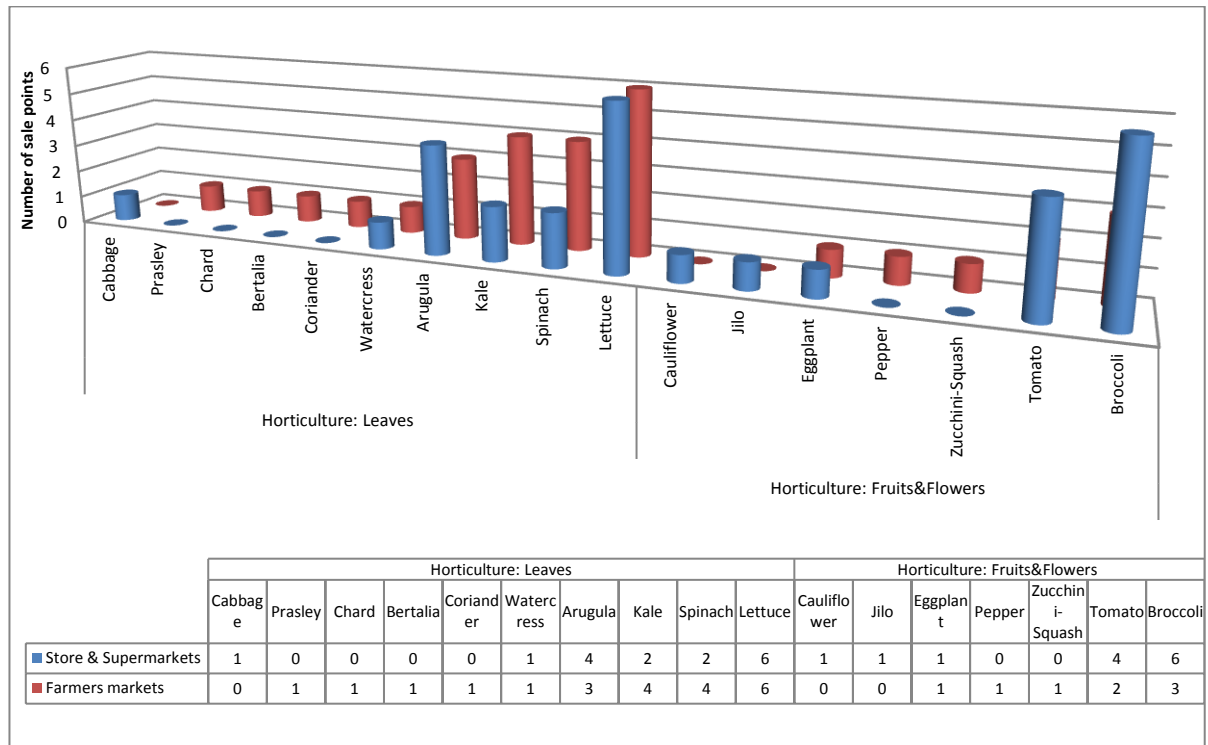
**Annex 7. List of products sold in 2011 through different value chains available at the municipalities under study.**

Nova Friburgo				Cachoeiras de Macacu		
Fruits						
Farmers Markets CCFO	Farmers Markets BJ	Home Delivery baskets	At conventional farmer markets	Farmers markets CCFO	Farmers markets "Org. para todos"	Sítio do Moinho
Avocado Acerola Banana Persimmon Fig Jabuticaba Orange-Bahia Orange-Camp. Orange-Lime Lemon Lemon-Galician Lemon-Sicilian Papaya Tangerine M Nirá Peach Mandarine Tangerine	Banana	Fig Lemon	Fig Lemon	Avocado Pineapple Acerola Banana-Earth Banana-Water Banana-Fig Banana-Apple Banana-Gold Banana-Honey Banana-PrataN Banana-PrataP Banana-vinager Persimmon Fruit bread Jenipapo Jabuticaba Malay apple Kumkuat Orange-Bahia Orange-Lime Orange-Natal Orange-Pear Orange-selected Persian lime Lemon-B Lemon-Galician Lemon-Sicilian Lemon-Tahiti Papaya Passion fruit Tangerine M Strawberry <sup>1</sup> Mandarine	Avocado Acerola Banana-Earth Banana-Water Banana-Fig Banana-Apple Banana-Gold Banana-Honey Banana-PrataN Banana-PrataP Banana-vinager Cajá Persimmon Fig Fruit bread Jenipapo Jabuticaba Malay apple Kumkuat Orange-Bahia Orange-Lime Orange-Natal Orange-selected Persian lime Lemon-Galician Lemon-Sicilian Lemon-Tahiti Papaya Passion fruit Tangerine M Mandarine	Coconut Orange-Pear Lychee Persian lime Lemon-Galician Lemon-Tahiti Tangerine M
Vegetables						
Squash Zucchini Saffron Chard Watercress Cassava Celery Rosemary Lettuce-Iceberg Lettuce-Japanese Lettuce-Boston Lettuce-Leaf Lettuce-Red Leek Chicory A. Sorrel Sweet potato Potato Eggplant Beet Broccoli leaves Broccoli head Onion	Arrowroot Curcuma Beans-French Ginger Egg	Zucchini Watercress Cassava Celery Lettuce-Iceberg Lettuce-Japanese Lettuce-Boston Lettuce-Leaf Lettuce-Red Leek Chicory A. Sorrel Sweet potato Potato Eggplant Beet Broccoli leaves Broccoli head	Zucchini Watercress Cassava Lettuce-Iceberg Lettuce-Japanese Lettuce-Boston Lettuce-Leaf Lettuce-Red Leek Chicory A. Sorrel Sweet potato Potato Eggplant Beet Broccoli leaves Broccoli head Onion	Squash Squash-Bah. Squash-Des. Squash-Goi. Squash-Jack Squash- Jap. Squash-Mor. Squash-Pau Zucchini Saffron Cassava Cassava-peeled Sweet potato Potato Lisa potato Eggplant Sugar cane Lemon grass	Squash Squash-Bah. Squash-Des. Squash-Goi. Squash-Jack Squash- Jap. Squash-Mor. Squash-Pau Zucchini Saffron Watercress <sup>1</sup> Cassava Cassava-peeled Celery <sup>1</sup> Lettuce-Japanese <sup>1</sup> Lettuce-Boston <sup>1</sup> Lettuce-Romaine <sup>1</sup> Lettuce-Red <sup>1</sup>	Squash-Bah. Squash-Des. Squash- Jap. Squash-Mor. Squash-Pau Cassava Sweet potato Eggplant Zucchini Beans-Cario. Beans-French Beans-Black Beans-Green Beans-Red Yam Jilo Corn Cucumber Chili-Cambusi

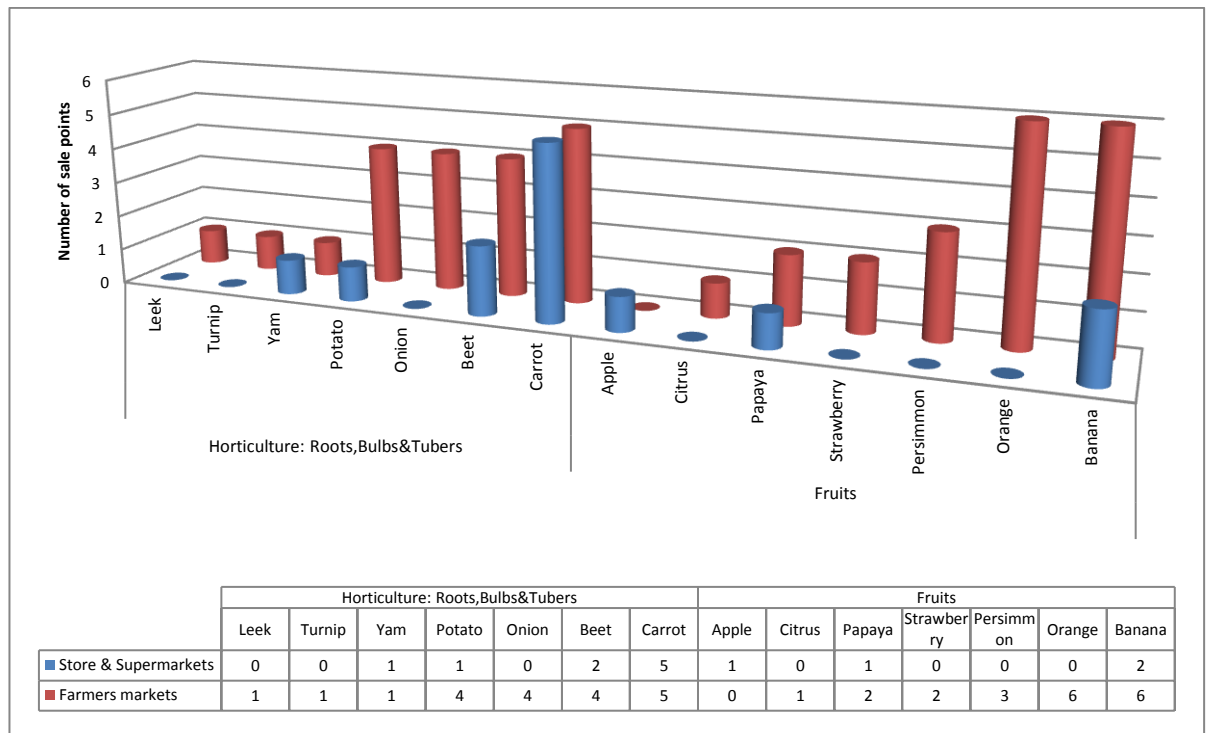
Potato	Onion	White onion	Onion <sup>1</sup>	Leek <sup>1</sup>	Chili-Mosa
Eggplant	White onion	White onion	Carrot	Sweet potato	Pepper
Beet	Carrot	Carrot	Curly parsley	Potato	Okra
Broccoli leaves	Curly parsley	Curly parsley	Chicory	Balm	Cabbage
Broccoli head	Chicory	Chicory	Chingensai	Beans-Cario.	Tomato
Lemon grass	Chingensai	Chingensai	Chayote	Beans-French	Tomato-Ce.
Onion	Chayote	Chayote	Coriander	Beans-Maua	Tomato-Pe.
White onion	Kale	Kale	Kale	Beans-Black	
Carrot	Cauliflower	Cauliflower	Cauliflower	Beans-Green	
Curly parsley	Peas	Peas	Beans-Red	White onion <sup>1</sup>	
Chicory	Spinach	Spinach	Flowers	Carrot	
Chingensai	Beans-French	Beans-French	Pigeon pea	Chayote	
Chayote	Beans-Green	Beans-Green	Yam	Dry coconut	
Clorofila*	Mint H.	Mint H.	Jilo	Coriander <sup>1</sup>	
Coriander	Yam	Yam	Maxixe	Kale <sup>1</sup>	
Kale	Jilo	Yacon	Corn	Cauliflower <sup>1</sup>	
Cauliflower	Laurel	Jilo	Cucumber	Balm	
Curcuma	Basil	Laurel	Chili-pepper	Spinach <sup>1</sup>	
Peas		Basil	Chili-Bequi.	Beans-Black	
Spinach	Mustard	Mustard	Chili-Cambusi	Beans-Green	
Beans-French	Turnip	Turnip	Chili-Chapeu	Mint H.	
Beans-Green	Oregano	Oregano	Chili-Mosa	Yam	
Mint H.	Egg	Pepper	Chili-Malag.	Jilo	
Yam	Cucumber	Okra	Chili-Green	Basil <sup>1</sup>	
Yacon	Chili	Radish	Pepper	Corn	
Jilo	Radish	Cabbage	Okra	Cucumber	
Laurel	Cabbage	Arugula	Cabbage	Chili-pepper	
Mallow	Arugula	Parsley	Taro-leaf	Chili-Bequi.	
Basil	Parsley	Savory	Tomato	Chili-Cambusi	
Lemon balm	Savory	Tah tsai	Tomato-Ce.	Chili-Mosa	
Mint	Tah tsai	Tomato	Tomato-Pe.	Chili-Malag.	
Corn	Tomato		Tomato salad	Chili-Green	
Mustard				Pepper	
Turnip				Okra	
Ora pro nobis				Cabbage	
Oregano				Arugula <sup>1</sup>	
Egg				Parsley <sup>1</sup>	
Cucumber				Taro-leaf	
Chili				Tomato	
Pepper				Tomato-Ce.	
Okra				Tomato-Pe.	
Radish				Tomato salad	
Cabbage					
Arugula					
Parsley					
Savory					
Tah tsai					
Taro-leaves					
Tomato					
Tomato salad					

<sup>1</sup> Crops exchanged at farmers markets in 2011

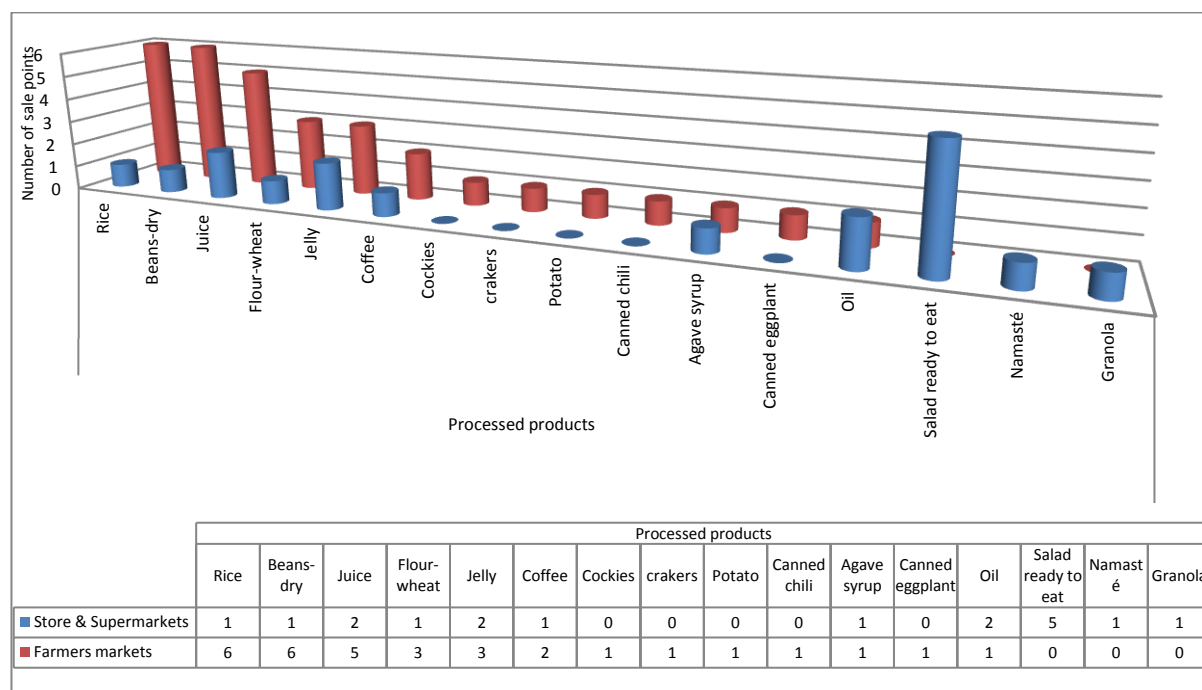
**Annex 8. Main Horticultural products (leaves, fruits and flowers) sold at all commercialization points where farmers from NF and CM sell their products**



**Annex 9. Main Horticultural products (roots, bulbs, tubers) & Fruits sold at the sell points where farmers from NF and CM sell their products**



**Annex 10. Main processed products sold at all commercialization points where farmers from NF and CM sell their products**



**Annex 11. Average indicators of agricultural products of Cachoeiras de Macacu which were sold at organic farmers markets in 2011**

#	Crops	Weekly amount					
		Max carried (Kg)	Max sold (Kg)	Mean Sold (Kg)	Min Sold (Kg)	Standard Dev. of mass sold	Times on market
1	Banana-Water	26.000	19.000	6.831	0.000	3.997	135
2	Okra	25.000	11.200	3.212	0.200	2.634	125
3	Banana-PrataP	40.000	30.000	9.400	1.000	6.585	117
4	Banana-Apple	25.000	25.000	4.037	0.260	3.266	98
5	Banana-Fig	15.000	12.000	3.497	0.000	2.387	97
6	Taro-leaf	3.000	2.100	1.037	0.300	0.441	94
7	Eggplant	25.100	16.690	5.908	0.165	4.433	90
8	Cassava	33.000	23.300	12.476	0.010	6.174	86
9	Banana-PrataN	52.000	43.520	9.529	0.000	8.225	82
10	Orange-Lime	28.322	25.500	9.930	0.000	5.782	79
11	Squash	51.000	34.360	11.127	0.000	7.020	77
12	Banana-Honey	21.000	20.000	6.694	0.200	4.391	77
13	Lemon-Tahiti	9.600	9.600	1.578	0.160	1.497	75
14	Sweet potato	20.000	15.000	6.454	0.500	3.866	70
15	Jilo	10.000	6.620	2.023	0.000	1.669	69
16	Papaya	6.000	5.220	1.650	0.000	1.110	68
17	Zucchini	14.000	10.000	3.069	0.000	2.714	59
18	Yam	100.000	21.000	11.242	0.000	5.482	56
19	Pepper	7.950	6.180	1.580	0.100	1.582	55
20	Orange-Natal	43.325	25.000	12.100	2.500	6.180	53
21	Banana-Gold	7.000	5.000	2.116	0.000	1.214	42
22	Lemon-Galician	7.992	7.992	2.973	0.000	1.833	42
23	Corn	18.300	13.800	3.324	1.200	2.293	38
24	Saffron	0.800	0.600	0.250	0.000	0.135	34
25	Beans-Black	27.300	16.300	4.886	0.000	2.878	34
26	Chili-Cambusi	7.750	3.710	0.792	0.030	0.674	34
27	Cassava-peeled	8.000	6.000	2.734	0.500	1.397	32
28	Chili-Mosa	2.100	1.030	0.343	0.050	0.272	29
29	Tomato	45.000	27.870	7.778	0.000	7.245	28
30	Potato	30.000	26.640	8.660	0.000	6.031	27
31	Orange-selected	25.000	25.000	11.808	2.750	4.399	26
32	Chili-Bequi.	3.000	1.170	0.388	0.000	0.289	26
33	Acerola	6.000	5.000	1.701	0.200	1.242	20
34	Persian lime	12.000	12.000	3.688	0.600	2.366	20
35	Lemon grass	0.300	0.300	0.099	0.000	0.071	17
36	Squash- Jap.	46.000	24.560	11.096	2.000	6.650	16



#	Crops	Weekly amount					
		Max carried (Kg)	Max sold (Kg)	Mean Sold (Kg)	Min Sold (Kg)	Standard Dev. of mass sold	Times on market
37	Carrot	6.700	5.460	2.691	0.700	1.286	16
38	Sugar cane	2.100	1.800	0.793	0.000	0.551	14
39	Squash-Bah.	19.800	11.000	6.272	1.100	3.292	13
40	Banana-vinager	5.000	3.000	1.442	0.000	0.938	13
41	Onion <sup>1</sup>	20.000	9.190	4.306	0.700	2.175	13
42	Beans-Green	6.000	6.000	1.988	0.000	1.749	13
43	Tangerine M	4.200	4.200	2.202	0.600	1.190	13
44	Squash-Pau	14.000	10.700	3.924	0.500	3.034	12
45	Tomato salad	2.500	1.800	0.999	0.350	0.425	12
46	Banana-Earth	16.000	6.500	3.236	0.000	1.968	11
47	Balm	0.180	0.120	0.071	0.000	0.043	11
48	Passion fruit	3.000	3.000	1.005	0.000	0.811	11
49	Squash-Des.	3.500	3.500	1.300	0.000	1.100	10
50	Squash-Mor.	18.000	11.500	4.792	0.000	3.708	10
51	Beans-Red	30.000	20.000	4.930	0.500	5.380	10
52	Orange-Bahia	24.000	24.000	5.448	0.000	6.958	10
53	Tomato-Ce.	7.200	4.400	2.714	2.000	0.752	10
54	Jaboticaba	10.000	9.500	4.226	1.200	2.384	9
55	Chili-pepper	0.300	0.300	0.126	0.050	0.072	9
56	Tomato-Pe.	7.300	5.000	2.584	1.000	1.164	9
57	Squash-Jack	20.000	18.900	7.243	2.000	5.280	8
58	Parsley <sup>1</sup>	0.300	0.300	0.263	0.200	0.048	8
59	Avocado	7.000	5.000	2.886	0.400	1.511	7
60	Lettuce-Boston <sup>1</sup>	1.000	1.000	0.686	0.400	0.236	7
61	Lettuce-Japanese <sup>1</sup>	1.000	1.000	0.800	0.600	0.200	6
62	Kale <sup>1</sup>	1.000	1.000	0.667	0.200	0.249	6
63	Spinach <sup>1</sup>	1.200	0.900	0.650	0.000	0.320	6
64	Beans-Maua	2.790	2.400	0.650	0.000	0.802	6
65	Fruit bread	5.000	5.000	1.967	0.000	1.701	6
66	Maxixe	0.400	0.400	0.267	0.200	0.075	6
67	Strawberry <sup>1</sup>	10.000	6.000	3.146	1.250	1.942	6
68	Mandarine	2.400	2.400	1.067	0.400	0.639	6
69	Cabbage	25.000	4.000	1.800	0.000	1.510	6
70	Celery <sup>1</sup>	1.200	1.200	0.720	0.000	0.407	5
71	Lettuce-Red <sup>1</sup>	1.600	1.600	0.680	0.000	0.515	5
72	Dry coconut	2.000	1.400	0.640	0.000	0.463	5
73	Jenipapo	1.700	1.500	0.680	0.000	0.655	5
74	Chili-Malag.	0.500	0.350	0.096	0.000	0.132	5
75	Broccoli head <sup>1</sup>	1.200	1.200	1.000	0.800	0.200	4
76	Coriander <sup>1</sup>	0.180	0.180	0.135	0.120	0.026	4
77	Beans-Cario.	6.000	5.500	2.500	1.000	1.768	4
78	Lemon-Sicilian	1.800	1.200	0.540	0.240	0.393	4
79	Squash-Goi.	45.100	16.060	10.777	5.520	4.303	3
80	Lettuce-Romaine <sup>1</sup>	1.000	1.000	0.800	0.600	0.163	3
81	Leek <sup>1</sup>	0.900	0.900	0.600	0.300	0.245	3
82	Persimmon	2.500	2.000	0.917	0.000	0.825	3
83	Malay apple	2.500	2.500	2.167	2.000	0.236	3
84	Cucumber	9.650	8.790	3.430	0.400	3.801	3
85	Arugula <sup>1</sup>	1.000	0.800	0.800	0.800	0.000	3
86	Watercress <sup>1</sup>	0.600	0.600	0.600	0.600	0.000	2
87	Beet	1.350	1.350	1.125	0.900	0.225	2
88	White onion <sup>1</sup>	2.000	0.400	0.200	0.000	0.200	2
89	Fig	0.300	0.300	0.250	0.200	0.050	2
90	Mint H.	0.120	0.120	0.120	0.120	0.000	2
91	Kumkuat	1.900	0.800	0.650	0.500	0.150	2
92	Chili-Green	4.000	2.160	2.125	2.090	0.035	2
93	Pineapple	0.400	0.400	0.400	0.400	0.000	1
94	Lisa potato	20.000	13.750	13.750	13.750	0.000	1
95	Cajá	0.900	0.300	0.300	0.300	0.000	1
96	Chayote	0.800	0.800	0.800	0.800	0.000	1
97	Cauliflower <sup>1</sup>	1.000	1.000	1.000	1.000	0.000	1
98	Beans-French	1.000	0.600	0.600	0.600	0.000	1
99	Flowers	0.180	0.060	0.060	0.060	0.000	1
100	Pigeon pea	1.500	1.500	1.500	1.500	0.000	1
101	Orange-Pear	24.000	13.920	13.920	13.920	0.000	1
102	Lemon-B	3.360	3.360	3.360	3.360	0.000	1
103	Basil <sup>1</sup>	0.120	0.060	0.060	0.060	0.000	1
104	Chili-Chapeu	4.000	1.620	1.620	1.620	0.000	1

<sup>1</sup>Crops exchanged at farmers markets in 2011

**Annex 12. Average indicators of agricultural products from Nova Friburgo which were sold at organic farmers markets in 2011**

#	Crops	Weekly amount							
		Exp. 2011 <sup>1</sup> (units)	Prod. 2011 <sup>2</sup> (units)	Max carried (Kg)	Max sold (Kg)	Mean Sold (Kg)	Min Sold (Kg)	Standard Dev. of mass sold	Times on market
1	Kale	125	113.273	12.000	11.000	4.690	0.000	2.611	194
2	Carrot	110	98.409	25.600	24.000	7.497	0.000	5.313	183
3	Beet	100	41.136	15.750	15.750	3.964	0.000	2.514	144
4	Spinach	105	37.636	10.200	9.600	2.616	0.000	1.725	143
5	Broccoli leaves	125	60.364	37.500	37.500	8.471	0.000	7.353	142
6	Lettuce-Japanese	105	66.227	12.000	8.400	2.920	0.000	1.714	138
7	Parsley	65	39.909	3.000	3.000	0.621	0.000	0.369	129
8	Zucchini	105	30.739	20.000	12.800	4.079	0.000	3.068	119
9	Arugula	85	51.795	12.500	10.800	3.324	0.000	2.426	115
10	Sorrel	45	17.773	4.400	4.200	1.209	0.280	0.684	99
11	Lemon	45	21.295	12.000	8.400	3.053	0.000	1.603	93
12	Radish	50	25.318	16.000	11.200	3.179	0.280	2.148	91
13	Leek	55	23.455	10.800	10.800	3.264	0.210	3.171	85
14	Cabbage	37	9.886	10.000	7.000	2.116	0.000	1.313	76
15	Lettuce-Iceberg	75	22.136	10.000	7.000	2.391	0.140	1.694	66
16	Broccoli head	90	31.795	35.000	35.000	8.960	0.000	6.714	64
17	Beans-Green	55	18.545	12.900	12.900	3.549	0.000	2.269	60
18	Lettuce-Boston	120	19.273	8.000	5.600	2.133	0.280	1.269	59
19	Cauliflower	90	27.568	25.000	20.000	8.202	0.000	5.148	59
20	Curly parsley	70	19.841	2.280	1.596	0.699	0.168	0.359	57
21	Chingensai	70	14.955	8.000	5.600	1.751	0.000	1.248	57
22	Chicory A.	25	5.182	2.400	1.680	0.622	0.140	0.309	52
23	Laurel	25	4.659	0.600	0.420	0.179	0.084	0.080	49
24	Egg	50	10.261	2.000	2.000	0.041	0.000	0.283	49
25	Mint H.	50	5.227	0.900	0.900	0.242	0.042	0.201	47
26	Peas	70	24.545	23.450	23.450	6.435	0.000	5.610	46
27	Yam	85	43.386	150.000	150.000	18.951	0.000	29.558	46
28	Coriander	80	12.841	1.800	1.740	0.611	0.000	0.367	45
29	Watercress	75	9.455	5.600	5.600	1.552	0.105	1.684	44
30	Beans-French	60	13.136	12.300	12.000	3.377	0.000	3.094	42
31	Rosemary	15	4.205	0.420	0.420	0.283	0.180	0.066	39
32	Potato	95	22.895	100.000	100.000	11.786	1.000	16.135	39
33	Chicory	45	5.659	4.000	2.800	0.894	0.140	0.607	39
34	Basil	10	3.295	0.480	0.480	0.244	0.060	0.095	39
35	Oregano	10	2.864	0.480	0.336	0.156	0.084	0.060	39
36	Tomato	110	9.682	16.000	11.600	3.488	0.400	2.705	38
37	Onion	50	10.364	15.000	15.000	5.336	0.350	3.997	37
38	Cucumber	75	6.932	14.400	10.400	2.604	0.000	2.291	37
39	Lettuce-Red	85	6.000	5.000	3.500	1.124	0.140	0.931	35
40	Sweet potato	65	9.159	10.000	10.000	5.073	0.000	2.671	35
41	Chayote	45	12.705	21.600	21.600	6.286	0.000	5.253	33
42	Chard		7.614	6.600	6.600	3.131	0.900	1.152	32
43	Eggplant	50	7.386	12.000	6.400	3.156	0.000	2.131	27
44	Banana	35	11.318	35.000	35.000	19.692	10.000	7.446	26
45	White onion	50	4.955	2.000	2.000	0.612	0.000	0.570	24
46	Cassava	30	20.159	32.000	32.000	21.750	5.000	6.657	22
47	Lemon balm	10	1.068	1.000	1.000	0.427	0.200	0.174	22
48	Tah tsai	23	3.795	4.000	2.800	1.169	0.280	0.611	20
49	Celery	65	2.614	6.000	4.200	1.625	0.210	1.028	19
50	Mustard	25	2.273	4.500	3.150	1.304	0.210	0.756	19
51	Okra	50	4.250	6.400	10.400	4.400	2.000	1.885	17
52	Savory	15	1.227	0.360	0.252	0.139	0.060	0.052	17
53	Mint	10	1.136	0.600	0.600	0.196	0.060	0.205	15
54	Chili	25	1.500	5.100	2.400	0.996	0.210	0.623	15
55	Curcuma		3.523	1.500	1.500	1.071	1.000	0.175	14
56	Yacon	35	1.750	8.500	5.600	1.977	0.350	1.333	13
57	Orange-Bahia		1.136	21.600	21.600	10.971	6.000	4.333	11
58	Mallow	10	0.386	0.600	0.600	0.309	0.200	0.156	11
59	Papaya		1.545	4.400	4.400	2.473	0.800	0.992	11
60	Clorofila*	15	2.205	6.000	6.000	3.880	1.600	1.443	10
61	Nirá		1.727	1.600	1.600	0.922	0.300	0.421	9
62	Taro-leaf		2.182	4.500	4.500	3.200	2.400	0.735	9
63	Jilo	30	2.386	15.200	9.600	2.915	0.280	3.244	8
64	Lemon-Galician		1.034	12.000	12.000	6.825	0.600	3.160	8
65	Tangerine		1.545	10.000	10.000	6.800	4.000	1.887	8
66	Turnip	10	0.580	1.000	1.000	0.634	0.400	0.213	7
67	Ora pro nobis	10	1.955	5.100	3.000	1.449	0.300	1.133	7
68	Pepper	25	2.318	9.300	4.500	1.971	0.600	1.424	7
69	Avocado		2.341	9.600	9.600	6.867	4.000	2.360	6
70	Squash	50	1.136	5.000	5.000	4.300	3.500	0.600	5
71	Fig	19	0.250	4.500	3.150	1.710	0.500	0.909	5
72	Tomato salad	125	0.545	4.000	4.000	1.840	0.800	1.120	5

#	Crops	Weekly amount							
		Exp. 2011 <sup>1</sup> (units)	Prod. 2011 <sup>2</sup> (units)	Max carried (Kg)	Max sold (Kg)	Mean Sold (Kg)	Min Sold (Kg)	Standard Dev. of mass sold	Times on market
73	Lettuce-Leaf	70	0.341	3.200	2.240	1.330	0.840	0.547	4
74	Mandarine		1.523	16.000	16.000	13.400	9.600	2.735	4
75	Orange-Lime		0.348	11.900	11.900	8.687	5.661	2.550	3
76	Peach		0.455	2.400	2.000	1.600	1.200	0.327	3
77	Lemon grass	10	0.068	0.120	0.120	0.090	0.060	0.030	2
78	Orange-Camp.		0.208	12.000	12.000	10.992	9.984	1.008	2
79	Lemon-Sicilian		0.250	7.200	7.200	6.600	6.000	0.600	2
80	Corn		2.045	9.000	9.000	8.500	8.000	0.500	2
81	Tangerine M		0.341	6.000	6.000	4.500	3.000	1.500	2
82	Saffron		0.227	1.000	1.000	1.000	1.000	0.000	1
83	Acerola		0.182	3.200	3.200	3.200	3.200	0.000	1
84	Lisa potato			17.000	17.000	17.000	17.000	0.000	1
85	Persimmon	25	0.455	4.000	2.200	2.200	2.200	0.000	1
86	Jabuticaba	25	0.636	14.000	11.000	11.000	11.000	0.000	1

<sup>1</sup>Expectations of production in 2011; <sup>2</sup>Production of 2011

### Annex 13. Average indicators of agricultural products from Nova Friburgo which were sold at conventional farmers markets in 2011

#	Crops	Weekly amount					
		Max carried (Kg)	Max sold (Kg)	Mean Sold (Kg)	Min Sold (Kg)	Standard Dev. of mass sold	Times on market
1	Lettuce-Japanese	6.200	4.340	2.494	1.120	0.817	53
2	Sorrel	2.400	1.680	0.911	0.280	0.370	53
3	Spinach	5.750	4.025	1.850	0.525	0.737	51
4	Carrot	12.000	8.400	4.949	0.560	1.900	49
5	Lettuce-Boston	5.000	3.500	1.902	0.420	0.739	46
6	Lettuce-Iceberg	6.800	4.760	2.321	0.140	0.991	43
7	Arugula	6.500	4.550	2.354	0.350	0.973	42
8	Beet	10.400	7.280	3.681	0.560	1.830	41
9	Chingensai	6.400	4.480	1.776	0.700	0.815	41
10	Kale	10.500	7.350	3.550	0.840	1.347	41
11	Chicory A.	1.600	1.120	0.630	0.140	0.230	36
12	Leek	4.800	3.360	1.164	0.420	0.620	35
13	Curly parsley	1.740	1.218	0.440	0.042	0.233	35
14	Chicory	4.600	3.220	0.885	0.140	0.557	34
15	Lettuce-Red	2.800	1.960	0.793	0.140	0.459	33
16	Radish	9.200	6.440	1.858	0.280	1.252	33
17	Broccoli leaves	4.500	3.150	1.484	0.420	0.703	31
18	Lemon	3.600	2.520	0.905	0.280	0.520	30
19	Cabbage	7.000	4.900	2.825	1.050	0.940	28
20	Watercress	1.200	0.840	0.497	0.210	0.164	26
21	Parsley	1.140	0.798	0.331	0.126	0.145	26
22	Peas	6.000	4.200	1.873	0.420	1.037	25
23	Laurel	0.600	0.420	0.134	0.042	0.077	25
24	Mint H.	0.420	0.294	0.150	0.042	0.064	23
25	Zucchini	15.500	10.850	3.605	0.700	2.684	20
26	Oregano	0.120	0.084	0.074	0.042	0.018	16
27	Tah tsai	1.800	1.260	0.683	0.420	0.320	16
28	White onion	0.720	0.504	0.171	0.042	0.116	15
29	Savory	0.300	0.210	0.104	0.042	0.043	15
30	Chayote	2.000	1.400	0.875	0.350	0.256	14
31	Sweet potato	3.500	2.450	1.292	0.700	0.538	13
32	Cassava	3.000	2.100	0.910	0.210	0.448	12
33	Cauliflower	13.000	9.100	3.967	0.700	2.229	12
34	Broccoli head	9.500	6.650	2.345	0.700	1.701	10
35	Beans-Green	10.200	7.140	2.893	0.630	2.026	9
36	Potato	7.500	5.250	2.756	0.350	1.338	8
37	Yam	6.000	4.200	1.619	0.350	1.249	8
38	Onion	5.000	3.500	1.750	0.700	0.877	7
39	Beans-French	3.300	2.310	1.500	1.050	0.455	7
40	Tomato	5.200	3.640	1.440	0.280	1.073	7
41	Mustard	5.100	3.570	0.980	0.210	1.167	6
42	Turnip	1.000	0.700	0.350	0.140	0.194	6
43	Pepper	3.500	2.450	1.050	0.350	0.700	6
44	Yacon	2.500	1.750	1.138	0.700	0.455	4
45	Jilo	2.000	1.400	0.770	0.280	0.500	4
46	Okra	4.500	3.150	1.733	0.420	1.219	4
47	Fig	3.000	2.100	1.283	0.700	0.595	3

#	Crops	Weekly amount					
		Max carried (Kg)	Max sold (Kg)	Mean Sold (Kg)	Min Sold (Kg)	Standard Dev. of mass sold	Times on market
48	Basil	0.300	0.210	0.182	0.126	0.040	3
49	Coriander	0.180	0.126	0.126	0.126	0.000	2
50	Lettuce-Leaf	5.200	3.640	3.640	3.640	0.000	1
51	Eggplant	0.400	0.280	0.280	0.280	0.000	1

Annex 14. Sample of final presentation of products sold at supermarkets and specialized stores.

