



Modified Seeds Market in Colombia
Governance Process in the Use of Modified Seeds in
Colombia

A Research Paper presented by:

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(Colombia)

in partial fulfillment of the requirements for obtaining the degree of
MASTER OF ARTS IN DEVELOPMENT STUDIES

Major:

Governance, Policy and Political Economy

(GPPE)

Specialization:

Public Policy and Management

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December 2013

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List of Acronyms

AGRA	Alliance for Green Revolution in Africa
ANDI	Asociación Nacional de Empresarios de Colombia (National Business Association of Colombia)
ANUC	Asociación Nacional de Usuarios Campesinos (National Farmers Association)
BA	Bilateral Agreement
Bio	Biotechnology Industry Organization
CAN	Andean Community
CEPAL	Comisión Económica Para América Latina (Economic Commission for Latin America)
CTNBio	Comisión Técnica Nacional de Bioseguridad (National Biosecurity Technical Committee)
DANE	Departamento Administrativo Nacional de Estadísticas (National Statistical Department of Colombia)
FAO	Food and Agriculture Organization
FAS	Foreign Agricultural Service
FTA	Free Trade Agreement
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GM	Genetic Modified
GMO	Genetic Modified Organisms
GR	Green Revolution
ICA	Instituto Colombiano Agropecuario (Colombian Agriculture Institute)
IMF	International Monetary Found
INGO	International Non-governmental Organization
ISAAA	International Service for the Acquisition of Agri-biotech Applications
ISS	Institute of Social Studies
ITPGR	International Treaty on Plant Genetic Resources for Food and Agriculture
MADR	Ministerio de Agricultura y Desarrollo Rural (Ministry of Agriculture and Rural Development)
MoR	Mode of Regulation
NDP	National Development Plan
NGO	Non-governmental Organization

OECD	Organization for Economic Co-operation and Development
R&D	Research and Development
RoA	Regime of Accumulation
RT	Regulation Theory
SAC	Sociedad de Agricultores de Colombia
SAP	Structural Adjustment Programs
TCE	Transaction Cost Economic
TNC	Transnational Companies
TRIPS	Trade in services and trade-related intellectual property rights
UN	United Nations
UPOV	International Union for the Protection of New Varieties of Plants
US	United States of America
USDA	U.S. Department of Agriculture
USTR	Office of the United States Trade Representative
VoC	Varieties of Capitalism
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

Abstract

This paper explores the governance architecture of the modified seeds market in Colombia, and how the different actors have interacted to establish and develop this market in the country. In order to understand how the use of modified seeds have been imposed in the agricultural sector this research utilize the French Regulation School and mainly its concept of Mode of Regulation to go beyond reductionist explanations and to acknowledge all the actors and institutions involved, its relationships and position they in certain time and places taking into account the history and the social, political, cultural and economic forces that have shaped this market. Through this analysis the paper argues that the insertion of Colombia into the international regime, characterized by different modes of production, has changed the forms of the Colombian State where the seeds Transnational Companies, the U.S. government and the International Institution have played an active role in the establishment of the market, and where lately the Colombian society has manifested against the legislation enacted by the government about the mandatory use of certified seeds.

Relevance to Development Studies

This research paper is relevant to Development Studies because it helps to understand the changing role of the State, the different international pressures that the ‘undeveloped’ countries are exposed and the new actors that interact at different society levels. It does so through the analysis of the governance architecture of the modified seeds market in Colombia which has caused multiple social, economic and political problems especially at a local level but influenced by global factors.

Keywords

Governance, modified seeds, Colombia, French Regulation Theory, Mode of Regulation, Institutional Forms, U.S. TNC’s, international institutions, agrarian strike

Chapter 1 : Introduction

1.1 Research Problem

The seeds are the principal input in farmer's production and the first link in food chain that is why them have become a key factor to take control in order to pursue economic interests. During the last decades seeds have undergone an intense commodification process that has caused different phenomena around the world, which in the Colombian case has brought severe social problems and manifestations.

In august 19 of 2013 began the National Agrarian Strike in Colombia that has been considered one of the most intense strike in the last years. The strike was called by farmers and farmers associations and supported by artisanal miners, cargo carriers, workers on the health and education sectors, students and other sectors of the Colombian society (Colombia n.d.). Among the list of agrarian demands were the repeal of agriculture legislation for small and medium size farmers including the storage and use of native seeds, price controls on agricultural inputs (fertilizers, pesticides, insecticide, etc.), and the review of the different Free Trade Agreements (MIA 2013a). This strike lasted 21 days and left millionaire economic losses and 12 dead, 485 wounded and 4 missed civilians in confrontations between demonstrators and the National Armed Forces (MIA 2013b). In order to finish the strike the government signed an agreement with the agricultural sector formalized under the repealed of the resolution 970 of 2010 related with seeds, agricultural inputs price reduction, protection of some agricultural products in future Trade Agreements, direct and indirect financial subsidies, cancellation of farmers debts, among others (Legiscomex 2013; El Espectador 2013).

Then why the seeds became a central argument in this strike? It is not a new issue in Colombia and has had constant changes in the last two decades mainly through the enactment of legislation for the defense of the intellectual property rights that has had an effect on farmers' rights and in its economic conditions. This led to the question about how the seeds market has evolved in order to cause this massive social manifestation? And who have been the actors behind it? This questions leads to think about how was before the seeds market in Colombia and how and why it has changed, and who have been the different actors that have taken part in this process and pushed for this change. This in order to take into account and

analyze others actors that are involved in the problem besides the market, that so far has been the main theoretical answer in the analysis and justification of the entrance and development of the seeds markets around the world. Then the different theoretical instruments give a different approach and new tools to understand these phenomena.

1.2 Research Question

Since the enactment of the resolution 970 in 2010 that established the requirements for the use, commercialization among other protocols of seeds in Colombia, the certified seeds topic was brought again into the agenda of the different actors at national scale (Government, civil society, and Private sector). But these legal measures (resolutions and laws) were not new in the country; furthermore, there has been a process where the globalization has brought to the governance arena new actors, institutions and legislation that have shaped and influenced the use of certified seeds in Colombia.

The Colombian farmers have been affected by the imposition of this laws by the Colombian government mainly in the recognition of their own ancestral rights for the free use and reuse of their native seeds, increase in its economic costs, and dependency on third actors, in this case on the Transnational Biotechnology Companies that are the main suppliers of the Genetic Modified Seeds and chemical agricultural inputs. Then this research paper will try to answer the question on: Why and how particular actors have influenced the changes in the governance system in the certified seeds market in Colombia? And in order to answer this question it also will try to answer the following sub questions:

How has the seeds market evolved in Colombia and worldwide?

How has the seeds market in Colombia been affected by changes in the institutional forms?

Which have been the coordinating mechanisms that interact in the governance process? And how they have interacted in this specific case?

In order to answer this questions the analysis is going to be made taking the French Regulation School as a basis and will focus on the concepts of “Mode of Regulation” (MoR) and “Regime of Accumulation” (RoA) that takes into account the extra-economic institutions and changes in the different institutional forms that will allow to establish the actors involved in the process, its relation and powers in order to map out the governance architecture of this market.

1.3 Relevance of the research

The governance process is a key aspect to analyze in the public policy arena, especially in the last decades were globalization has brought new arrangements, institutions and actors to it, causing a reform in the paradigms and where the decision making and the public policy are affected and influenced by global actors outside the boundaries and reach of the state. In the case of the seeds market and its influence in the agriculture around the world there have been shifts of power that have caused changes in the public policy, particularly in the use of certified seeds and in intellectual property rights, in some developing countries.

Then is relevant for the public policy to understand these changes in power and the different levels of influence of the other actors, where the state has loose some of its power and it is influenced and pressured by international actors. Then is appropriated to understand the limitations and strengths of each of the actors and how are the interplays of them in a globalized era in order to go beyond reductionist explanations and have a deeper understanding of the governance architecture of the seeds market.

1.4 Paper organization

This paper is divided in six main chapters. Chapter two gives an historical context of the modified seeds market and the evolution of certified seeds legislation in Colombia. Chapter three focuses on the theoretical framework, methodology and method used in this research paper. Here an overview of the French Regulation School is provided focusing on its main concepts that are useful to analyze the Colombian case and establish the relationships of the actors and the institutions. Chapter four develops the first two of the three steps of the method in order to establish the actors, its relations and the changes in the institutional forms that have formed the govern-

ance structure. Chapter five establish the mapping of the governance model that summarize its architecture and how the different actors involved have shape the development of the certified seeds market in Colombia. The last chapter summarizes the main findings of the analysis.

Chapter 2 : Historical context

This chapter gives a background on how has been the global evolution of the genetic modified seeds, which are the principal companies around the world and explains the two main perception about the use of Genetic Modified Organisms (GMO's). Followed by the summary of the different resolutions enacted in Colombia about the use of certified seeds in the country and the defense of intellectual property rights, specifically on the breeder's rights, in order to understand how has evolved and why the resolution 970 marked the difference.

2.1 Modified seeds market

In the 1970's after the prohibition of some of the most used toxic pesticides in the U.S, as DDT, the companies started to focus and invest more on Research and Development (R&D) especially on the genetic engineering in order to modify the seeds genetic material and make them insect, disease and environmental resistant and/or herbicide tolerant (Tokar 2004a: 8). Besides this increase in R&D in the private companies, in 1980 the Supreme Court of US decided that was possible to patent an organism that have new characteristics as a result of genetic engineering, this decision increase the investment and development in this industry and made that in 1983 were created the first transgenic plants and that in 1992 the first transgenic plant was commercialized (UN 2004: 47).

These two facts started a process where the private companies entered into the seeds market and began the commodification of seeds, from public provision and its free use to a private one were the peasants have to pay for them. As is stated by Stein (2004: 162-163) in the past the US government circulated seeds freely to the peasants and them had the right to reuse their own seeds, even further "in the past, the public sector dominated agricultural research; today, in industrialized countries the private sector accounts for the vast majority of agricultural research" (Sell 2009: 190).

"In less than three decades, a handful of multinational corporations have engineered a fast and furious corporate enclosure of the first link in the food chain" (ETC group 2008: 11). The global commercial seed market was valued in 2007 at \$26,700 million, from this the global proprietary seed market participate with the 82%. Into the proprietary seed market the 10 biggest companies

own 67% of it, and the three biggest ones: Monsanto located in US (23%), DuPont located in US (15%) and Syngenta located in Switzerland (9%), sum 47% of the market (Ibid: 11-12).

There are two different perceptions about the use of GMO's. On one hand some peasants, NGOs and some governments have manifested against the use of the GMO's mainly because is a threat to the food sovereignty of the country as now they have to rely their production on transnational seeds companies. Besides new productions costs arises to the peasants not only from the seed but also from the package that they have to buy with them, as is stated by Stein (2004) many peasants does not have enough economic resources to purchase them and their historical rights of natural seeds selection and evolution are not taken into account. Furthermore many NGOs as is stated by Grupo Semillas (2013a) proclaim that seeds are a collective heritage that belongs to the country and their communities and the traditional and heritage rights must be taken into account. On the other hand there are some actors that see GMO's as a solution to hunger problems because they can increase the yield and the productivity, provide more income, supply more nutrients in some crops, reduce the risks of loses and improve the country's competitiveness (Sell 2009: 196).

2.2. Seeds in Colombia

As mentioned above the legislation about the use of certified seeds started before the enactment of the resolution 970 by the "Instituto Colombiano Agropecuario" (Colombian Agriculture Institute) (ICA). But why the society reacted to this norm in particular? In order to understand its consequences and differences a brief explanation is made below on how the seeds market legislation has evolved in Colombia and which ones has been the main changes introduced.

The first norm was the decision 345 of 1993 of the "Comunidad Andina" (Andean Community) (CAN) that "recognize and ensure the protection of the rights of breeders of new plant varieties by the grant of breeders' certificates" (CAN 1993: 1) and was promulgated in the country via the law 243 of 1995. Through this decision the country adhered to the UPOV 78 that does not affect the native seeds, recognize the rights of the farmers of the Food

and Agriculture Organization (FAO)¹ and focus more on the seeds developed by the seed companies. Article 26 establishes that anyone has the right to stock and sow the harvest if it is for its own consumption or if it is sell as a raw material or food, and cannot be used for multiplication for commercial use, then the farmers could use part of its harvest to sow it again without violating the breeders' rights (Ibid). Later the Decree 2687 of 2002 enhance the protection time of the breeder rights according to the UPOV 91 from 18 to 25 years for forestry and fruit trees and from 15 to 20 years for the rest of plants.

In 2006 via Law 1032 the article 306 of the Colombian Penal Code was modified. It establishes the fines and penalties for the usurpation of plant varieties breeders' rights, this mean that someone that sells or distribute certified seeds or confusing similarity with one certified will be penalized with prison from 4 to 8 years and with economic penalties from 16.5 to 1.500 times the statutory monthly minimum wage (Congreso de Colombia 2006). This law introduced two differences from previous rules, first the farmers cannot re-sow seeds obtained from crops sowed with certified seeds without permission from the breeders and second it introduces the term of confusing similarity causing the penalization of the farmer if the native seed that is been used is confused with one protected. Even though this law does not prohibit the use of native seeds it promotes the use of protected seeds and goes against the FAO farmers' rights.

In 2010 the Colombian government enacted resolution 970 that established the requirements for the use, commercialization among other procedures of seeds in the country. The main changes that this resolution introduced compared with the previous ones are: a) It establishes the use of certified seeds with specific characteristics for certain crops as the only way to saw in a legal way; b) Prohibits the store and use of the seeds taken from previous harvest; c) The farmers must follow the technical recommendations given by the seed producer. d) The farmers that do not follow this regulation can be penalized economically and legally (ICA 2010). Then, this

¹ FAO resolution 5/89 defines farmers rights as: "rights arising from the past, present and future contributions of farmers in conserving, improving, and making available plant genetic resources, particularly those in the centres of origin/diversity. These rights are vested in the International Community, as trustee for present and future generations of farmers, for the purpose of ensuring full benefits to all farmers, and supporting the continuation of their contributions, as well as the attainment of the overall purposes of the International Undertaking" (FAO 2007: 3)

resolution forces farmers to buy certain certified seeds and prohibit the use of local or native seeds under certain conditions, also it implies the use of a technological package that must be used in order for the seeds to work.

Law 1518 of 2012 approved the UPOV 91 that enhanced the rights of the breeder of plant varieties. The mainly changes of the UPOV 91 revised version in comparison of the 78 version are: a) “Defines breeder as “the person who bred, or discovered and developed, a variety” (UPOV 1991) that must accomplish the conditions of novelty, distinctness, uniformity and stability to be protected. Here the term novelty is understood more towards a commercial novelty, this means that a plant could be registered if it has not been sold or disposed by others; b) Enhance the breeders’ rights adding restrictions to reproduction, innovation of protected varieties and stocking of the harvested material as propagation material; c) Allows the double protections, then the variety can be protected through the plant breeders’ rights and by patents (Ibid). At the end of the same year this law was found unenforceable by the Constitutional Court because it was not previously consulted with the different ethnic minorities and the different communities affected by the law.

Then resolution 970 was not the only law that was on force when the agrarian strike took place there has been a chain of different steps that has led to the current situation. This resolution caused a major discomfort to the farmers because in the first place it increases the production costs imposing to buy certified seeds and agricultural inputs, costs that were not took into account before, second the non-recognition of the traditional rights over the native seeds and the dependency on third persons losing the control over their modes of production and food systems, and third that it was applied to all framers without any exception (Grupo Semillas 2013b:18-19; Stein 2004: 162-165). In relation to economic factors the modified seeds have two net effects: On one hand, as is mentioned above, there is an increase on the production costs but on the other hand the companies stand for the increase on the crops yield, reduce on the labor and improve of crop protection that reduce the risk of lost (CEPAL 2004: 222), then the net incomes depends on the costs and benefits that modified seeds gives to the farmers. According to the Comisión Económica para América Latina (CEPAL) (2004) for the average commercial producers the use of modified seeds increase the agricultural inputs costs but this are compensated with the increase on incomes, that at the end reflect an increase on their net revenues. But what happens with the

small and medium sized farmers? And on those cases where the seeds does not work in the microenvironments?

In Colombia around the 52% of the national area belongs to the small and medium sized farmers distributed in the 99% of the plots of land and contributes 50% of the national production, this means that most of the plots of land are size limited and are used towards local and auto consumption that limits the economic resources of the farmers (Salamanca et al 2009: 19; Perfetti et al 2013: 199). Then the dependency factor on the use of modified seeds affect almost all the Colombian rural population because it excludes the farmers with limited resources that cannot afford the companies seeds prices and its agricultural inputs (CEPAL 2004: 234). Besides the access problems to this new inputs the farmers have also faced difficulties with the performance of some of the seeds as in the case of modified cotton crops in Tolima and Cordoba where was sown the Monsanto Cotton Bollgard (Bt) in 2006-2007, that produce a natural pesticide, and later Monsanto introduced the Cotton Bollgard and Roundup Ready (Bt and RR) that adds herbicide tolerant. The introduction of this modified seeds to the region increased three times the prices of the seeds compared with the native seeds, the yield was not improved and new plagues appear (Grupo Semillas 2009). As Alejandro Polo, technical chief of Coopiagros (Cooperative of agricultural engineers in Cordoba) states that the cotton growers “have been saying to the ICA for two years that this [the modified seed] does not work in the region”² (Semana 2013).

Then the introduction of the modified seeds into the country has been a long process with multiple legal, political and economic steps and where multiple actors have interacted, which has have an effect on the Colombian farmers and institutions. In order to understand better this phenomenon, the actors involved and the changes in the institutions the next chapter explains which theory is used to approach it.

² Original in Spanish: “Llevamos dos años diciéndole al ICA que esa no sirve en esta región”.

Chapter 3 : Theoretical framework

This chapter aims to explain the theoretical framework that is used in the analysis of the research problem. First, is briefly explained why other theories were not choose to approach the problem even though they have instruments and arguments to explain it. After, the emergence of the French Regulation School is summarized, its levels of analysis, and the main concepts that are used further on this paper. Once the school is explained, the next step is for explain the methodology used and the three steps method to map out the governance system of the seeds market in Colombia.

3.1 Possible theories to be used

There is not only one school that has the instruments to allow the analysis of the different national and international economies. Besides the Regulation School there are schools as Varieties of Capitalism (VoC) or Transaction Cost Economic (TCE) perspective that have their own assumptions, unit of analysis and theoretical concepts. These two approaches are explained briefly below.

Even though the VoC shares whit the Regulation theory that the market is not the only coordinating mechanism, that there is not only one best way for capitalism (Boyer 2005: 509) and both criticize that the minimized transaction costs are not the only basis of institutional economics (Ibid: 535-536). The main differences lie in that VoC highlights the different modes of corporate organization, focus as unit of analysis the firm and in the private firm governance, and that only recognizes two modes of capitalism (liberal market economies and coordinated market economies), meanwhile the Regulation Theory recognizes and focus on the different forms of capitalism, different institutional forms and different coordinating mechanisms besides the market (Ibid: 509-510). Then the VoC has the risk of focus on market logic and not take into account other coordinating mechanism and institutions (Ibid: 536), that the Regulation Theory allows.

Besides VoC one possible mainstream explanation to the problem is the TCE perspective that is the product of the New Institutionalism Economics and the new economics of organization. This is firm based approach that understand the theory of the firm as a governance structure and not as a production function (Williamson 1998: 23). Its basic unit of analysis is the transaction which “moves

economics in the direction of being a science of contract, as against a science of choice” (Ibid: 36). Then this perspective puts transaction costs as the way of economizing of the firms and how they can minimize these costs (Ibid: 53). This perspective just centered in the firm as the coordinating mechanisms and focus on how they can minimize their costs and increase their profit, which provide just economic causes for the entry of TNC’s to new markets, which is opposite to the Regulation Theory that even though it consider the market and the firm as coordinating mechanism also takes into account non-economic actors and institutions providing extra tools for the analysis, as it is explained below.

3.2 The French Regulation School

At the mid-1970’s started the French Regulation School as a critique of orthodox economics and structural Marxism as an answer of Fordism crisis that could promote new ways of accumulation and regulation more appropriate to the new circumstances. It criticized three main points about orthodox economics: First, rejected a self-regulating market economies towards a general equilibrium and proposed a social embeddedness of the economic relations. Second, argued that time matters and economics are path-dependent then time cannot be ignored and all institutions (Economic, political and social) must be taken into account as an endogenous factors. And third, the school concentrated on the changing norms of production and consumption and in the different economic modes. About structural Marxism the French regulationists rejected the thesis of automatic reproduction of capitalism and focused on the conditions that allows accumulation, also it brought back the subjects as actors and not only as supporters in the economic analysis, and sees capitalism as a changing system with its crisis and transitions and not as unchanging as the structural Marxists use to understand it (Jessop 1997a: 504-505). Summing up and as is stated by Jessop the regulation school “aims to study the changing combinations of economic and extra-economic institutions and practices which help to secure, if only temporarily and always in specific economic spaces, a certain stability and predictability in accumulation” (Jessop 1997b: 288).

The regulation approach is characterized because it has three different levels of analysis with its own hierarchical structure that helps to understand the different concepts and how they are related with each other. In the first level the modes of production and their

articulation are analyzed, which defines any associations “between social relations and economic organization... that is, the social relations governing the production and reproduction of the material conditions required for human life in society” (Boyer 1986: 32). For the capitalism mode of production there are two specific relations: The exchange relations that takes the form of commodity and generates payment requirements and relations of production, these two relations makes accumulation fundamental in the system. In the second level the regulation theory moves from social relations to the regimes of accumulation, this means the social relations are analyzed as regular social and economic patterns that happen in certain place and time and allow accumulation to happen. At a third level of analysis the regulation theory examines the institutional or structural forms, in order to define the origins of the patterns derived from the mode of production. These are hierarchized through the MoR which gives stability to the regime of accumulation and allows accumulation and its reproduction (Boyer 1986: 32-48; Boyer and Saillard 2005a: 38-39). Once the Regime of Accumulation and the Mode of Regulation secure the conditions for a capitalist expansion it is studied as model of development (Jessop 1997b: 291).

One of the key concepts of the Regulation School, which basis are fixed in economics discipline, is capital accumulation which gives the broad perspective of its objective (Jessop 1997a: 508). The capital accumulation in the capitalist mode of production has two central notions: reproduction and rupture. First term allows what exists to keep existing (Aglietta 1979: 12) and is opposite to rupture, related to a crises “in the continuous reproduction of social relations” (Ibid: 19). Then the capitalist mode of production requires the reproduction of capital but “all accumulation regimes and modes of *régulation* are affected by a series of disequilibria and conflicts that eventually destabilize them” (Boyer 2002: 2) and do not allow a general equilibrium as is stated by the neoclassical theory.

Then the regulation theory gives an alternative perspective and analysis from the neoclassical theory and goes beyond the market approach and economic institutions and allows to understand different phenomena taking into account social relations and different institutions that change over space and time. There are four pillars that characterize regulation theory: 1. The regulation theory takes into account different disciplines (As history, sociology and political science) and dimensions (social, political, cultural) besides the economic in order to obtain different hypothesis and reconstruct the field of analysis; 2. It offers basic concepts that can be used for ana-

lyzing different phenomena in specific time and places; 3. Historicity, this means that in the regulation theory the theories came out from the history and the future depends on the present; 4. Even though that the regulation theory is methodologically homogenous with neoclassical theory, because they use the same hypothesis, it explains the facts for a better construction and comprehension of the theory (Boyer, R. 2002: 5-6).

3.2.1 Regime of Accumulation (RoA)

An accumulation regime is defined as “the set of regularities that ensure the general and relatively coherent progress of capital accumulation, that is, that allow for the resolution or postponement of the distortions and disequilibria to which the process continually gives rise” (Boyer 1986: 35-36). This means that the RoA allows a stable process of accumulation through the reproduction of certain social forms that occurs in certain time and space, and specify the dynamics of the national and/or sectorial growth model.

According to Juillard (2002) the accumulation regimes can happen in extensive or intensive situations of accumulation. The first one, occurs when there is a spreading of the capitalism development to new economic activities without affecting significantly the labor or capital productivity, the latter occurs when intensive accumulation takes place and there are shifts in the productivity of labor (2002: 154). That is why the RoA can be identified by “the combination of at least three factors...: Technical change..., the level of contribution of wage income to the dynamics of the means of consumption section..., finally, the degree of extraversion of the economy” (Juillard 2002: 158). The technical changes affect the labor productivity and the process of accumulation itself, and are affected by institutional arrangements and by the same accumulation process.

3.2.2 Mode of Regulation (MoR)

As it was said above the MoR helps to stabilize the Accumulation Regime because it “establishes a set of procedures and individual and collective behavior patterns which must simultaneously reproduce social relations through the conjunction of institutional forms which are historically determined and supported by the current accumulation regime” (Boyer and Saillard 2005a: 41), these institutional forms are the rules, laws, norms, agreements, organiza-

tional forms, social patterns, networks and organizations that allows to stabilize certain structures. It is constituted by different institutional forms that are derived from the mode of production, that in the case of capitalism are five and define patterns of the social relations and economic reproduction: 1) Forms of monetary constraint; 2) Conditions of the wage relation; 3) Forms of competition; 4) Position within the international regime and, 5) Forms of the state (Boyer 1986: 37-41). This institutional forms and its combination shape individual conduct and “also predetermines the working of adjustment mechanisms operating through the market, which usually derive from a set of rules and organizational principles without which they could not function” (Boyer 1986: 44).

3.3 Methodology

The research question is going to be analyzed through a case analysis method; thereby the study of the certified seeds market in Colombia. In order to approach to this case and analyze the different moments, actors and institutions that have influenced, interacted and affected this research paper uses the French Regulation School that supports, a method and a theoretical framework for the study, identification of actors and institutions and its relation contextualizing them in certain time and space. Then this school is useful to explain the relations inside the governance model, how they have evolved and how different actors have affected the governance structure. As is stated by Jessop and Sum (2006: 47) the regulation approach recognizes that there are other modes of coordination besides the markets, as is establish by the neoclassical theory that allows the production and reproduction of capital. In order to carry out the study this paper focus mainly in the third level of analysis of the Regulation School that emphasis on the institutional forms that stabilize the RoA and help to define the origins of the patterns of the social relations.

Even though this research paper aims to study all the actors and the different states that have affected the seeds market in Colombia during the last decades it is important to mention that most of the literature published about this topic is directly related with the US and its role in promoting the genetic modified seeds companies and its use around the world. Then most of the cases and relations presented in the Colombian case analysis are connected with the US.

Once the relations between the different actors and institutions are established the next step is to map out the governance structure in the evolution of the certified seeds market following the scheme of Gereffi and Mayer (2004) that allows to differentiate between developed and developing countries, different actors and intra and international institutions.

3.3.1 Why is the regulation theory useful to explain this case?

As has been described the regulation theory and its main concepts approaches to the different phenomena in a different way than the neoclassical school and the structural Marxism because it goes beyond the firm centric and market explanations and takes into account different institutions, actors and its interactions and places them in certain places (e.g. Colombia) and sectors (e.g. Seeds Market), in order to explain the different phenomena and how all this variables are connected and affect each other. Then it allows to understand and explain how the certified seeds market has evolved in Colombia and define which are the different institutions and actors that have taken part on it through the Institutional Forms and how it has been stabilized to ensure the reproduction and accumulation of the market in order to construct and establish the governance model of this market in Colombia.

3.4 Method

In order to answer the research question this paper use three different steps, the first two apply the main concepts and theory of the French Regulation School through a partial use of the well-tempered Cartesianism method proposed by Boyer (1986). It consists in just using the first two steps of the four proposed by Boyer that fits for this research purpose in order to understand how the certified seeds market has evolved during the last decades and how the relations among all the actors have been established in Colombia. The third and fourth steps are rejected because it goes beyond the establishment and interaction of the actors and institutions towards the macroeconomic and econometric modeling of the economic mechanisms (step 3) and the long-term study of the economic dynamics of each ROA (step 4) (Boyer 1986: 63-65), then this two steps focus more in a quantitative analysis that does not contribute to the objective of this paper.

Once the actors, institutions and the relations between them has establish in the steps one and two, the step three focus on map out the governance model following the scheme of Gereffi and Mayer (2004) through the political economy analysis of Hollingsworth and Boyer (1998a).

3.4.1. “Using history to establish a periodization of institutional forms” (Boyer 1986: 61).

This first step consists on identifying the fundamental dates that marked a change in the different institutional forms, this will lead to make a comparison between the different configurations of the social relations and how the new institutional forms have emerged. This analysis can be accompanied by some quantitative analysis that together with the qualitative allows a periodization of the institutional structures in certain time and space (Ibid: 61). Here the concept of MoR is going to be partially used, specifically some of the institutional forms that constitute it. Even though there are five institutional forms, and all of them are relevant to the regulations school, this research paper is going to focus on three: Position within the international regime, forms of the state and forms of competition. This were selected according of its relevance for the research objective that will help to explain how the certified seeds market has evolved in Colombia and how the governance process has been evolving.

Position within the international regime

“The nature of a country’s membership in the international regime...is defined by the set of rules that organize the nation-state’s regulations with the rest of the world, both in terms of commodity exchanges and the localization of production, via direct investment or through the financial of capital inflows and external deficits” (Boyer 1986: 40). Then this institutional form highlights that the international institutions and its relation with the state and its national law cannot only be explained by market exchanges there are “principles, norms, rules and decision-making procedures which assure the stability and relative coherence of the behavior of different agents within the international economy” (Boyer and Saillard 2005a: 40).

In this era the capitalism mode of production sets the dynamics of the international regime which is characterized by “its great potential for technological and social innovation” (Vidal 2002: 109). Then each country adapts its domestic norms into the international

regime which gives opportunities to growth but also impose limitations on them. These decisions are shaped by the international regulation that “translates the principles of the international regime into norms and institutions... [and its main forms] are trade and financial networks, multinational firms, the international monetary system and trade agreements” (Ibid: 109). So national regulations are shaped by two forces, in one hand the domestic factors and in the other the insertion into international regime, which can causes confrontations between the actual international order and the national circumstances (Boyer 1986: 41).

Understanding the position of the country and the forms of insertion into the international regime is basic to understand the national institutions and the governance architecture in a national level or in a specific sector (e.g. In this case in the certified seed market in Colombia). It also shed lights on how the seeds market started in Colombia and how the national laws have been changing in order to be part of the international regime.

Forms of the State

The state understood “as a distinctive arena of confrontation among different social forces which is reflected politically in changing institutionalized compromises” (Jessop 1997b: 298) is an essential element along with international regimes to secure the conditions for stabilize the accumulation regime, orient the regulations, generate patterns according to the institutionalized compromises, elements that shapes the form of the state (Boyer and Saillard 2005b: 339).

According to the regulation theory the state has three principal roles: “guaranteeing certain economic and extra-economic preconditions for the profitable operation of capital; securing the economic and extra-economic conditions for reproducing labour-power; and coordinating global flows of capital with national labour markets and addressing the resulting contradictions” (Jessop 1997a: 513). Then the analysis of the state in the regulation theory is more focus on its relation with the economy and its forms are configured by its fiscal and monetary regime, wage-labor nexus and access to state produced goods and services (Boyer and Saillard 2005a: 40). Then analyzing the different forms of the state helps to understand in a deeper way the relations between the states and the TNC’s and how the modified seeds companies are related with the developed and undeveloped states according to their forms of sovereignty, legitimacy and fiscal.

Forms of Competition

The forms of competition establish the way on which relations are organized between producers, these are shaped by the different competitive mechanism that allow free competition or monopolies and how them impact for the accumulation and profitability (Boyer 1986: 39). Globalization has modified the way of analyzing the forms of competition taking them to a global dimension and focusing more in the design of products and services and the technology involved on them, this analysis take into account the relations between companies and inside of them, the different markets where they operate and its relations with the financial system (Hollard 2002: 106-107).

Here it is also concerned the rules of commerce, the institutions that takes part on the transactions and traders in order to develop commerce en each country (Pascal 1999: 226). Then the forms of competition are linked to the institutions that helps the new markets to develop through the commercial laws and the different regulations of the markets (Ibid: 30). This institutional form helps to understand the growth of the transnational seeds companies and analyze how the new factors of competition between companies and the different institutions, technologies, laws and mechanisms allows this market to growth.

Forms of monetary constraint and conditions of the wage relation

Despite the fact that these institutional forms are part of the actual mode of production and are relevant for the Regulation theory, are less pertinent to analyze the current phenomenon because in one hand the monetary form is “a specific form of the fundamental social relation that establishes the commodity subjects... [in other words money is a mean] of establishing relations between the center of accumulation, wage earners, and other commodity subjects” (Boyer 1986: 37) and does not affect deeply because the price competition and the exchange rates does not play an important role in the market. On the other hand the conditions of wage relation refers to the way on how surplus is appropriated in the mode of production (Boyer and Saillard 2005a: 39) and is linked with the actual RoA but does not influence in the relations and connections between the actors in the governance architecture.

3.4.2. “Begin with the implicit logic of each institutional form and confirm its domain of applicability” (Boyer 1986: 62).

The objective of this step is to analyze the situation of “social relations and economic structures... [taking into account] the origin of the rules and regularities prevailing in the economic order” (Ibid: 62). Then once is establish the key dates, the actors and the changes in the institutional forms this step focus in the establishment and development of the social relations between the actors and institutions and how is its situation at the present.

3.4.3. Map out of the governance model

Gereffi and Mayer (2004) shows how have been the response from the public and private governance and how the actors interact and influence each other. They identify the main actors in the global governance:

- a) The society: Represented by unions, NGO’s and INGO’s.
- b) The market or the private sector: Firms and transnational companies. And for this paper purpose farmers are added as individuals that obtain their incomes and way of living from their agricultural business.
- c) Government: The states of developed and developing countries and the International Organizations as well as the bilateral agreements (BA) and the free trade agreements (FTA’s) made between developed and developing states.

In order of establish these relations and its directions this paper uses the work of Hollingsworth and Boyer (1998a) that study the different modes of coordination in the different levels of society (regional, nation-state, transnational and global) and its institutional arrangements, that gives the theoretical background in the construction of the governance model and its architecture. Here global governance architecture is understood “as the overarching system of public and private institutions that are valid or active in a given issue area of world politics. This system comprises organizations, regimes, and other forms of principles, norms, regulations, and decision-making procedures.” (Biermann et al. 2009: 15).

Chapter 4 : Analysis of the certified market in Colombia through the French Regulation School

In order to analyze the different relations between the actors involved in the certified seeds markets in Colombia through the Regulation Theory is necessary first to define the certified seeds sector and its main characteristics as presented at the first part of this chapter at two levels: worldwide and in Colombia. Also here the key dates are identified within the institutional forms changes and the principal actors that interact on it. Once the actors are identified the second part analyzes the relations between the actors and the institutional forms that interact on it.

4.1. Seeds companies

As it is mentioned in the historical context of this paper the seeds market started to develop in the 1970's with the aim to modify the genetic material of plants in order to increase its yield and make them herbicide and insect tolerant. This led to the increase in the R&D investment of the seeds companies where technological innovation has played a prominent role in the development of the seeds market and agricultural growth, but also have influence and have been influenced by the social, cultural, political and economic relations (Williams 2009: 158-159).

The development of these companies have been characterized by two phases; the first one, during the 1970's and 80's most of the companies were small and medium sized that experimented with different techniques of DNA plants modification, that mainly were born from different public institutions and universities (Falkner 2009: 227-228). At the beginning of the 80's the public R&D for agriculture started to shrink where the universities did not longer had an easy access to this funds and where public institutions had to merge with private ones in order to keep running and where the private organizations saw business opportunities to control the market through patents and private property laws in agriculture (Sell 2009: 212-213) that started in 1980 in US. The patents purpose is to protect new ideas, promote R&D and secure the recovery and profits of the investment made, in the agricultural biotechnology sector, "six companies alone hold 75 percent of all US patents granted to the top thirty patent-holding firms: Monsanto, DuPont, Syngenta, Dow, Aventis, and Grupo Pulsar" (Ibid: 189).

The second phase started during the 1990's with the increase of financial requirements for R&D, field tests, increase in the commercialization, and needs of advanced scientific and technological infrastructure the sector shifted from many small and medium sized companies to a small number of big industrial companies especially in "the late 1990s... characterized by consolidations, mergers, and acquisitions as well as by the increasing internationalization of the seed industry" (Lesser 1998, as cited in Williams 2009: 160). This creates an economic barrier to enter to the market because there was not only horizontal integration of the companies there was also vertical integration as "strategy of integrating crop development, agrichemical production, and seed distribution" (Falkner 2009: 229), creating an oligopoly led by Monsanto, DuPont and Syngenta. This barriers also found a new component in 1998 when the Technology Protection System (most known as Terminator Technology) was patented by USDA and Delta and Pine Land (Sell 2009: 201). This technology prevents the seeds from reproducing after the first harvest, and it was acquired by Monsanto in 1999 for \$1,76 billion (Stein 2004: 168), and even though this seeds have not been released into the commercial market this company is still developing it and can change completely the seeds sector panorama and the final commodification of seeds.

At 2013 twenty seven countries around the world, nineteen developing and eight developed countries, were using genetically modified crops that grown 175.2 million hectares, number that has been growing since 1996 when the commercialization started with 1.7 million hectares. In the last years the tendencies between the hectares grown by developing and developed countries have changed, before 2011 developed countries used to grow more modified crops but now developing countries are taking the lead with 54% of the total, even more in 2014 two more developing countries (Panama and Indonesia) approved the use of modified crops. The first five countries that grow this crops are US, Brazil, Argentina, India and Canada that sow mainly corn, cotton, soybean and canola (James 2013).

4.2. Seeds market in Colombia

According to the 'Departamento Administrativo Nacional de Estadísticas' (National Statistical Department of Colombia) (DANE) in 2013 23,78% of the population of Colombia lived in rural area, in the same year the agricultural sector was the third sec-

tor that contributed more in the growth of the Colombia's GDP with a growth of 5,5%, after industry and commerce, and also was the third sector that contributed with direct employment. Then the agricultural sector is one of the key economic sectors of the country and one that generates direct and indirect employment for its population. Inside this sector one fundamental link of the production chain are seeds that are the basis for produce any agricultural product. That is why any change that affects this link will have effects on the country's economy.

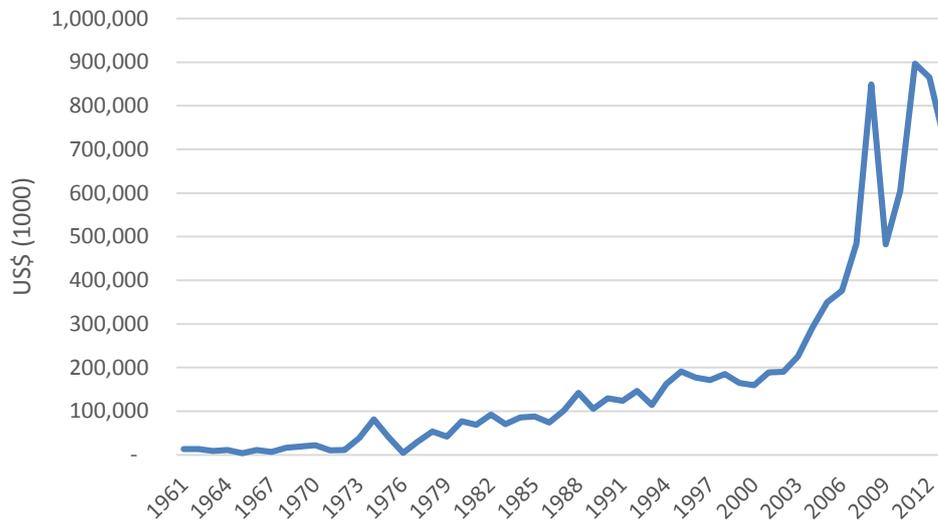
The legislation about the use of certified seeds is not new in Colombia and has been implemented and changed during the last two decades without much resistance, but during the last three years this issue has been positioned in the agenda. The seeds market in Colombia has had main changes during the last century starting with the arrival of Green Revolution (GR) in the 1970's and followed by the introduction of genetic modified organism in the 1990's.

Before the arrival of the GR the seeds around the world were considered to be a public good and of common property were the farmers could use part of their harvest to re-sow them, sell to others farmers or save them (Stein 2004: 162). This process led to the improvement of the seeds through natural methods where the seeds with higher yields were manually or natural selected in order to improve the crop yield, quality and biological characteristics from harvest to harvest (Solbrig 2004: 34). The GR had as objective the implementation of science in the agriculture in order to improve the methods that were traditionally used (Williams 2009: 173) "it consisted mainly in three factors: the grow of new varieties with higher yield; massive use of fertilizers, essentially with nitrogenous, and herbicides and pesticides, and third the rise of mechanization and the irrigated surface" (Solbrig 2004: 38).

Colombia was one of the countries that took into account the principles of the GR starting at the beginning of the 1960's and focused on the improvement of cotton, rice, sorghum, soy beans and sugar cane, main commercial crops of the country (León and Rodríguez 2002: 10), following the recommendations and the pattern established in the US, Colombia main food policies were the standardization of technologies, that carry out the massive importation of fertilizers and chemical products (See Figure 1), specialization on the selected products and start the importation of low price food, mostly cereals (Gaviria 2011:127), that were heavily subsidized by the US government by direct subsidies to the farmers and

subsidies to the exports through negotiated prices (Friedmann 2000: 497).

Figure 1: Fertilizers Imports (Value)



Source: Author own compilation, data retrieved from FAOstat (2014) for the years 1961-2001 and SIEX (2014) for the years 2012-2013.

In the beginning of 1990's the country started a process of economic deregulation in order to promote economic growth following the recommendations of the Washington Consensus, the main policies adopted were the promotion of the free trade market, decentralization of the state, privatization of the public companies, deregulation to promote market entry, legal security for property rights, among others (Moncayo 2003: 74-75). This process also led to the sign of numerous international agreements and the entrance to international organization as the GATT (1981) then WTO (1995), CAN (1969), and eight FTA's, which have had impacts on the evolution of property rights laws related to seeds in Colombia, mainly by the adoption of UPOV 78 in 1993 and different attempts to include changes of the UPOV 91 in the following years, first the Decision 345 in 1993 promulgated by the law 243 of 1995, after the decree 2687 of 2002 followed in 2006 by the law 1032 then the resolution 070 of 2010 and recently in 2012 the law 1518. This pieces of legislation were explained in the section 2.2 of this research paper.

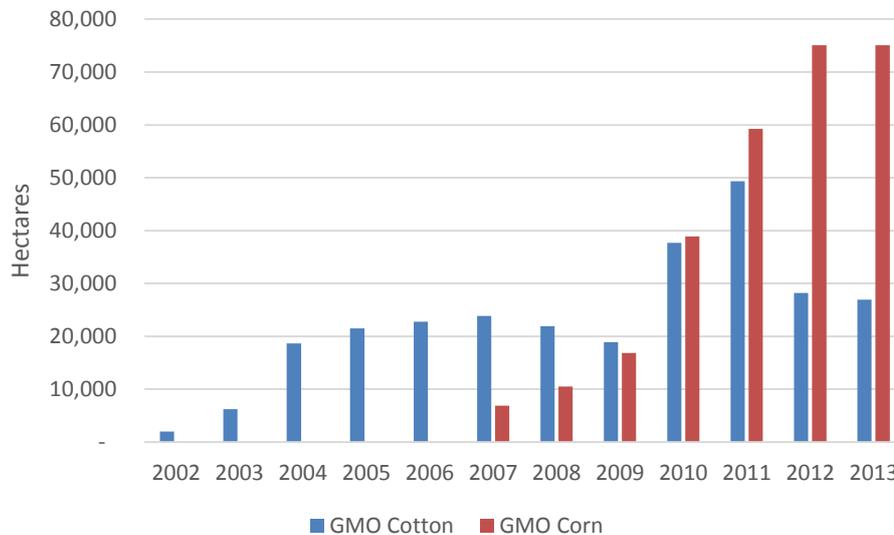
In 2005 through the enactment of the decree 4525 was regulated the implementation in Colombia of the Cartagena Protocol on Biosafety to the Convention on Biological Diversity which “seeks

to protect biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology” (Convention on Biological Diversity n.d.). This decree’s objective is “to establish the regulatory framework of the living modified organisms”³ (MADR 2005: 2) and creates three separately National Biosecurity Technical Committees (CTNBio) for Living Modified Organism for the approval of transgenic uses in agriculture, environment and health and human nutrition (Ibid: 7-9). The agriculture CTNBio committee is formed by the MADR, MINSALUD, MINAMBIENTE, COLCIENCIAS and ICA (Ibid: 7) this decree modified the ICA agree 0002 of 2002 and 00013 of 1998 were besides the members mentioned above were also ACOSEMILLAS, ANDI, ANUC, SAC and the National University of Colombia (ICA 1998; ICA 2002).

The genetic modified seeds entered to the country for the first time in 2002 with modified Cotton Bt through the ICA resolution 1247 where the CTN recommended to the ICA the approval for the commercial sow in the Colombian humid Caribbean (ICA 2003: 2-3). Since this date, the country has received multiple requests for the entrance of new products, so far the crops that have been approved for sow and use in food that use genetic modifies seeds are: Corn, cotton, rice, soybean, wheat, sugar beet, carnations and roses, being the first two the most sowed (See figure 2). Other crops as cassava, coffee, potato, tobacco and sugar cane are just in field tests and have not been approved by the Colombian government for its consumption, these crops are under supervision of research centers (Hodson and Castaño 2013). Most of the seeds imported comes from US specifically from Monsanto and DuPont, followed by Syngenta from Switzerland and from Netherlands for the flower seeds (FAS 2014).

³ Original in Spanish: “es establecer el marco regulatorio de los organismos vivos modificados”.

Figure 2: Area planted with GMO in Colombia



Source: FAS 2014: 3

Monsanto entered to the Andean Region (Colombia, Venezuela, Ecuador y Peru) between 1960 and 1970, specifically in 1971 established the product development department in Colombia. In 1997 arrived the first seeds shipment in the country and in 2003 obtain the approved for commercial use and planting of the Cotton Bt. In 2008 increase its participation in the country through the acquisition of the seeds company Cristiani Burkard (Monsanto n.d.). Up to 2012 the Colombian government has approved to Monsanto 4 different varieties of GM corn, 6 of GM cotton and 1 GM soybeans for sowing and human and animal consumption, besides there is more varieties under test phase and only for human and/or animal consumption (Hodson and Castaño 2013). In 2010 the ICA penalized Monsanto because of the lost suffered by the cotton growers in the season 2008-2009 when the seeds used did not performance as the company advertised them and caused problems to 2.400 farmers (Portafolio 2010).

4.3. Main changes in the Institutional forms that affected the seeds market

The existing international regime is based in the neo liberal capitalism principles namely free trade commerce, globalization, decentralization and privatization that have reduced the power of the state and its intervention and has allowed the entrance of new ac-

tors and the redistribution of power among them, mainly the market. Colombia started the formal adoption of this process through the Political Constitution of 1991 that followed the main principles of the Washington Consensus that allow the opening of the external sector, increase in the Foreign Direct Investment, reduced the role of the state and increase in the defense of the private property. During this process international organizations as the International Monetary Fund, the World Bank and the WTO were key actors in implementing and advice for the implementation of neo-liberal policy (Tejedor 2012: 58-59).

As is stated by Vidal “the evolution of national régulations is based partly on domestic factors, especially major crises, but also on constraints imposed by the country’s international insertion” (Vidal 2002: 114). In the Colombian case the internal factors that caused changes in the regulations and laws towards the dominant international regime were the major crisis of the external debt in Latin America in the 1980’s and the poor results of the previous economic model that focused on the substitution of importations through industrialization. At the same time and during and after the end of the Cold War started the spreading of neo liberal policies leaded by the hegemony of US that act as an external factor for the country’s insertion to the international regime. During the 80’s after the failure of the import-substitution model the “imports rose again, and international institutions, due to the economic crisis, urged the countries to adopt structural adjustment policies, consisting of a few economic policy recommendations that would lead to the reestablishment and reinforcement of the international food regime” (Gaviria 2011: 130). Then US, the World Bank, and the IMF were central in the process of Colombia’s insertion into the current international regime.

The World Bank along with the IMF had pressure for the implementation of neo liberal politics through loans to developing countries. The World Bank assign almost half of its portfolio in Structural Adjustment loans, this means the borrower can only spent the economic resources in specific changes of its economic policy, same as the Structural Adjustment Programs (SAP) led by the IMF (Tokar 2004b: 53). Broadly this SAP were focused on set free the currency exchange rate in the international markets, open the market to international commerce, reduce national direct subsidies in all sectors and keep low inflation rates through interest rates (Patel 2012: 102). In the agricultural area the main requests was to change from crops for subsistence and mainly aimed to local markets to crops for exports with specific production techniques relat-

ed to GR, leave the agricultural price to the markets and open the agricultural trade (Tokar 2004b: 53). Furthermore for the biotechnology agriculture it supported two aspects: First encompasses technical assistance and capacity building for governments, aimed at facilitating the introduction of new biotechnologies and establishing biotech-friendly regulatory regimes. The second is direct support for biotech research” (Ibid). Then developing countries, as Colombia, give up some of their power and policy sovereignty to their creditors, whom put the conditions for their development and agricultural methods and relying more on the private sector. The main institution that carry out this function and settle the framework was the WTO (Patel 2012: 103-104).

The TNC’s played also a role in the establishment of the international regime discourse together with the international institutions mentioned above. The World Bank has been one of the principal promoters of the biotechnology in order to reduce poverty and establish sustainable development through an increase in the use of chemical products and high yields seeds (Tokar 2004b: 52), that has open the world market to the private sector. The TNC’s has been using in its discourse the concepts of food security and environmental sustainability in order to promote the use and consume of GMO’s that going in the same way as the international organization discourse. This discourse focus on three central concepts: a. Improve of efficiency, is linked to environmental sustainability through better use of limited resources based on the use of technology for the increase in productivity through sustainable production methods. b. Eradication of world hunger, the new seeds varieties have been sold as the solution for eradicate the world hunger by the increase in crops production taking into account the earth capacity and the population increase. c. Raise of global nutrition, this achieved by the improvement in the crops nutritional attributes enhancing levels of vitamins and minerals, as the golden rice that is enhanced with vitamin A (Williams 2009: 166-170). Then “defining agricultural biotechnology to encompass food security makes it an issue of central concern for governments in poor countries (Ibid: 168).

Once Colombia began the implementation of the neoliberal policies back in the 90’s the Form of the State start changing towards the international regime and the recommendations made by it, in this case reducing its scope and giving more power to the market mechanisms. For the Regulation Approach the state has three main roles that help to address this changes:

In the first role the Colombian state has secured the preconditions for the operation of capital of the certified seeds market first through the implementation of neoliberal politics based on the Washington Consensus and the conditions for loans made from the World Bank and the IMF and second joining international organizations as the WTO, WIPO, ITPGR and different FTA's that establish the conditions and defense of the property rights for the plant breeders in this case the transnational seeds companies.

Once the preconditions were secured the second role of the state was to establish the conditions through the enactment of different laws, rules and resolutions that set the internal conditions for reproducing labor-power of the transnational companies as is analyzed in the section 4.4.4. Along with these laws the Colombian state offers and promotes programs and credits that has on their requirements the use of certified seeds. FINAGRO the entity in charge of facilitate the financial access in rural areas offers through the program "Desarrollo Rural con Equidad" (Rural Development with Equity) of the MADR special credit lines with subsidies on the interest rates and among the requirements it demands the use of certified corn seeds in projects related with the sow of yellow corn (FINAGRO 2014a: 5). In the same way in the documents required for the access to the agrarian and rural credits in projects related with sow of rice, soybeans, sorghum, corn and cotton must be presented the purchase invoices of certified seeds (FINAGRO 2014b: 29). Furthermore the government program "País Maíz" that started in 2011 with the purpose of reactivate the corn sector through the sow of modified corn that has among the requirements the use of certified seeds and provides technical assistance in order to increase the productivity and strength the Colombian food security (Presidencia República de Colombia 2011)

Beside establishing the pre-conditions and conditions the third role of the state is to coordinate the global flows of capital and the internal markets and actors, then here is where the Colombian state has become the principal actor in the regulation for deal with the external pressure of the international organizations and developed states and the resistance of the national society for the use of certified seeds, as have been seen in the cases of the resolution 970 of 2010 and the law 1518 of 2012. Then the Colombian state has play a key role in the form of insertion into the international regime and its decisions have been the results of political decisions, with external and internal pressures, and not only market driven.

Jessop (1997b) identified three different trends of changes in the state: a. Denationalization of the state, where the state is 'hol-

lowed-out' and its functions are restructured at different institutional levels. "This involves a partial loss of de jure sovereignty by national states in certain respects as policy-making powers are transferred upwards to supranational bodies and their rules and decisions become binding on national state" (Jessop 1997b: 305); b. Destatization of politics, this means a change from government to governance relaying more beyond the state apparatus with other organizations at all levels; c. Internationalization of policy regimes, the state focus more on its international competitiveness where the international context influence the state actions and the involvement of transnational factors and actors that "include foreign agents and institutions as sources of policy ideas, policy design and implementation" (Ibid: 306).

As can be analyzed the Colombian state has followed mainly the first and third trend and in recent years has showed also features in the second. In first place the state with the Political Constitution of 1991 suffered a restructuration of its functions through decentralization and privatization processes. In reference to policies for seeds's regulation minimum room for maneuver was left. Regarding the implementation of laws for the defense of the intellectual property rights, this compromises between the Colombian state and international institutions are analyzed in the next section. Second, Colombian state has made international competitiveness one of the main trends for its economic development during the last two decades as can be seen in the political and technical agenda. This agenda has focused in increase and diversification of exports through the increase of competitiveness of the national industry and promote the foreign investment as is stated in the National Development Plan (NDP) 1998-2002. Later on the 2002-2006 NDP one of the main strategies was the permanent access to international markets through FTA's (Mincit n.d. b: 1-2). In the 2006-2010 NDP added the improve of competitiveness in the agrarian sector (Ibid: 6). Third, even though almost all the decision have been influenced and implemented following the international parameters in the recent years some Colombia NGO's and the society itself has involved in this process and the government has moved more towards a governance process were the civil society has been taking more into account. It has to be said that this process that is just starting has not been easy for the society and it has had to resort to national strikes, as happened in 2013 with the National Agrarian Strike that suspend the resolution 970 and its being modified (El Espectador 2013).

Different Forms of Competition have influenced the insertion of the state in the international regime. The globalization process and the new ways of competitive mechanisms between producers towards the use of technology has caused changes in the seeds market and its evolution. Following Hollard (2005) in the analysis of the forms of competition the next items are analyzed: a. Forms of the production organization: The seeds companies are characterized by its high investment in R&D. This has modified the relations between companies and inside them because has limited the access of new companies to the market and has led to a process of vertical and horizontal integration in the sector, establishing an oligopoly. As is stated by ECT (2011) the seeds and the chemical sector are closely linked “five of the top six agrochemical companies also appear on the list of the world’s biggest seeds companies” (ECT 2011: 22) and the one remaining is involved with Bayer CropScience, the seven biggest seed company. b. Market forms: This sector has been influenced by the changes in the rules of operation that affect it and at the same time it has influenced this rules. Since 1980 with the expansion on private property rights on living organism the biotech industry started to grow and increase its investment in R&D and in the number of patents requested (Sell 2009: 189). Then so far the TNC’s economic power relies on the defense of the intellectual property rights in each country but the introduction of Terminator technology can change completely the market structure and the interaction among firms and lead to a monopoly where property rights would be in a secondary level and will lead “to increase the proprietary value of US-owned seed companies and to open developing-country markets” (Ibid: 202).

The changes occurred in this three institutional forms shows two principals results for this paper objective. First, it allows to identify the main actors involved in the development of this market in Colombia that are the Colombian and the US governments, international institutions as the WTO, World Bank, IMF and FTA’s, transnational companies and civil society. Second, it allows to establish the relations between these actors that helps to set up the governance structure that is analyzed in the next section.

4.4. Relationships between actors

Once the actors have been identified through the changes in the institutional forms this section aim to analyze the main relations identified: TNC’s and US government, International Organizations

and TNC's, US and Colombia governments, Colombia government and International Organizations and civil society and Colombia government.

4.4.1. TNC's and US government

According to Burnham (1991) TNC's have been the engine for global economic internationalization supporting an inter-state system competition to improve the structural power of transnational capital, this power is highlighted by the states attempts to attract TNC's to their territories "which is further evidenced in the 'political and economic risk analysis' undertaken by TNC's in appraising concessions and inducements offered by nation states" (Burnham 1991: 86). As is cited in Middendorf et al (2000) the Biotechnology Industry Organization (BIO) "declares itself to be the one of the cornerstone industry of America's future economic growth" (Middendorf et al 2000: 109) Then TNC's have enough economic power to pressure the states in order to follow their private interests.

The instrumental power of TNC's can be found in the participation of private firms on the policy making committees of the Office of the United States Trade Representative (USTR), office that is responsible for developing and coordinating U.S. international trade. Among these committees there are the Agricultural Policy Advisory Committee that has a subgroup for seeds, and that represents Monsanto and another big companies; and the Industry Trade Advisory Committee, that ensures that industry has a voice in the formulation of trade policy, among its members there is representation of the biotechnology industry inside the group of Intellectual Property Rights (Sell 2009:191).

Furthermore, there also have been recently cases of revolving door between US and biotech industry were some of the former employees that worked in biotech companies or close related now are working in the US government in positions that are linked with the industry and causes conflict of interests, some of this cases are stated below in table 1:

Table 1: Revolving door cases in US

Name	Current US government Job	Old Job
Roger N. Beachy	Former Director (as of May 2011) National Institute of Food and Agriculture, largest public funder of ag research awards. Appropriated \$1.2 billion in funding in 2009.	Former president of the non-profit Danforth Plant Science Center, founded with \$50 million gift from Monsanto
Rajiv Shah	Director, US Agency for International Development	Former agricultural programs director, the Bill & Melinda Gates Foundation; board member, Alliance for Green Revolution in Africa (AGRA)
Islam A. Siddiqui	Chief Agriculture Negotiator, Office of US Trade Representative	Former vice-president, CropLife America, pesticide/biotech lobby group
Ramona Romero	General Counsel of the United States Department of Agriculture (USDA)	Corporate Counsel at DuPont

Source: ETC Group 2011: 24.

Another element of the biotechnology industry instrumental power is its extensive lobby capacity, “biotechnology corporations have been generous funders of US election campaigns, with their contributions totaling US\$3.5 million between 1995 and 2002 alone” (Smythe 2009: 108). The center of Public Integrity shows how US companies have tunneled at least US\$173 million through “voluntarily disclosed gifts to trade associations and other politically engaged nonprofits in 2012” (Center of Public Integrity: 2014). Among them Monsanto give US\$528.000 mainly to different biotechnology and seeds associations and the Us Chamber of Commerce, DuPont gave US\$ 490.524 (Ibid).

Among the main lobby organization of the biotechnology Industry in the US are the Biotechnology Industry Organization (Bio) and CropLife. The first one “spent US\$143 million on lobbying from 1998 to 2002, which included regular meetings with, and support for, the biotechnology caucus of Congress to “educate” them on the industry” (Charman 2001, as cited in Smythe 2009: 108).

On the other hand the US government through the USDA offers to the industry the role of market facilitator and supports the marketing of different agricultural products, included modified seeds. The Agricultural Market Service offers intellectual property rights protection through its Plant Variety Protection Office, and the Foreign Agricultural Service (FAS) that has multiple programs as Market Access Program, Emerging Market Program, Technical Assistance for Specialty Crops among others, (FAS 2013) whose main purpose is “to improve the understanding and acceptance of genetically engineered agricultural products worldwide” (Ibid).

4.4.2. International Institutions and TNC's

The World Bank initial biotechnology agenda was defined mainly by a report published in 1991 that study the contributions of the biotechnology to the agriculture and its main findings were to promote the adoption of this technology in the developing world because it increase the crops productivity and help to improve small farmers' conditions (Tokar 2004b: 55). “The advisory committee that review the final report included Val Giddings, now vice president of the Biotechnology Industry Organization, and Gabriel Persley, who has contribute to advise the bank on biotech policy, while serving on the board of the industry-sponsored International Service for the Acquisition of Agri-biotech Applications (ISAAA)” (Ibid).

Also the Transnational companies have been involved in the liberalization process because it enhances its market and reduce the institutional costs. One of the key actors has been Cargill⁴ that get involved during GATT creation when “the original US proposal to the Uruguay round was drafted by Cargill's former senior vice president, also a former officer of the US Department of agriculture” (McMichael 2000: 136). The GATT agreement was the basis in the creation of the WTO and followed the same principles as free liber-

⁴ Cargill is the biggest private company in US that started as a grain storage facility and those days distribute and produce at international level agricultural products (FORBES 2013).

alization, reduce price supports, drive prices down, enforce of property rights and open new markets (Ibid: 136-138). Monsanto bought in 1998 Cargill's international seeds operation enhancing the market and specialization for both companies (Monsanto 1998) and in the same year they formed a joint venture in order to enhance agricultural products through biotechnology (New York Times 1998).

4.4.3 US and Colombia

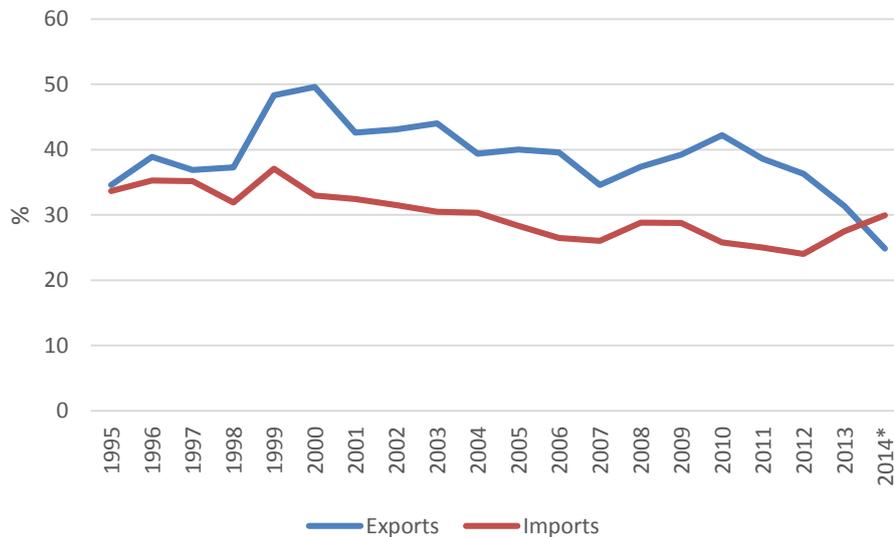
Then why US has had such an influence in Colombia? First, US is the biggest commercial partner of Colombia, during the last 20 years 39% of Colombia exports and 30% of its imports (See figure 3) has been with US, on the other hand Colombia weighed in 2012 only 1.1% in US total exports and 1.2% in its total imports (Observatory of Economic Complexity n.d.). Second, US government has appropriated financial Aid to Colombia mainly through the Plan Colombia⁵ that during the period 2000 to 2013 gave US\$ 9.316,9 millions (Beittel 2012: 38) focusing in the beginning on counternarcotics and campaigns against terrorist organizations and later towards the Economic Support Found focus on crop eradication (Manual or aerial), illegal crop substitution and infrastructure improvement (Ibid: 31-32). In order to arrange these objective Colombia provide US access to seven military facilities for 10 years and a maximum of 1.400 US personnel in the Country (800 military personnel and 600 contractors) (Ibid: 39). This aid also had as a consequence the involvement of Monsanto in the aerial eradication through the use of RoundUp and RoundUp ultra, Monsanto's most sold herbicide (CorpWatch 2001). Third, "The United States and Colombia have signed agreements on trade, environmental protection, asset sharing, chemical control, ship-boarding, renewable and clean energy, science and technology, and civil aviation" (U.S. Department of State 2013) this make stronger and closer the relations between the two countries and also put more pressure to accomplish all the conditions otherwise one fail on them can be the cause to stop the other agreements. Fourth, both countries have had reciprocal support historically in different instances. In 1985 US supported Colombia in the debt renegotiation with the IMF and the World Bank after Colombia government implemented austerity actions and cooperated in antidrug campaigns (Hanratty and Meditz

⁵ Plan Colombia started in 1998 as a strategy of the Colombian government "to end the country's armed conflict, eliminate drug trafficking, and promote Development" (Beittel 2014: 4)

1998: n.d). In 2012 Colombia pledged US support in order to become a member of the Organization for Economic Co-operation and Development (OECD) (The White House 2012) considered as a fundamental step in the country's development. And in the other hand the support to US of Colombia government for the Irak war in 2003 (Russell and Tokatlian 2009: 229) among other cases.

This relation reflect the power that US has over Colombia not only economically but also as an ally because its influence in the international regime as it is explained in the section 4.3. These facts put pressure over the Colombia government to accept and accomplish all the negotiations made with US and do not give room for maneuver.

Figure 3: Exports (Imports) to US/ Total exports (Imports)



Source: Author own compilation, data retrieved from DANE (2014).

4.4.4. Colombia state – International Institutions

Colombia is member of many International Institutions besides the ones cited below but for the purpose of this research paper the following ones have influenced more in the intellectual property rights requirements and affected the certified seeds market.

(i) World Trade Organization (WTO)

The WTO was establish in 1995 after the Uruguay round (1986-1994) and replaced the General Agreement on Tariffs and Trade (GATT) created in 1947, its main function is to deal “with the rules

of trade between nations at a global or near-global level” (WTO 2011:9). Now days counts with 160 countries members that agree under certain agreements of trade in goods, trade in services and trade-related intellectual property rights (TRIPS) and the settlement of disputes concerning WTO provisions. The certified seeds market is influenced by the TRIPS that introduce the property rights guidelines into the trade system and its purpose is to bring international common rules and ensure minimum protection standards, starting with the accomplishment of the main agreements of the World Intellectual Property Organization (WIPO) (WTO 2011) that is going to be analyzed next. In relation to “the plant varieties... [them] must be protectable by patents or by a special system (such as the breeder’s rights provided in the conventions of UPOV)” (WTO 2011: 41), and will reviewed after four years of the entrance of the country, as is establish in the article 27.3(b) of TRIPS. These laws not only have to be implemented they also have to be enforced through national laws that establish tough penalties in order to prevent violations.

Colombia was member of the GATT since 1981 and has been member of the WTO since its creation in 1995. As a member of the WTO it compromises to the TRIPS agreements and fulfill this requirement through UPOV78 that was enacted in 1995.

(ii) World Intellectual Property Organization (WIPO)

Colombia is WIPO member since 1980, this is a United Nations agency established in 1967 that counts with 187 members, and its objective is “to promote the protection of intellectual property throughout the world through cooperation among States and, where appropriate, in collaboration with any other international organization” (WIPO 1979: art 3(i)). Among its main functions is to promote the protection and synchronize the legislation of intellectual property rights around the world, provide legal assistance and help in the closure of agreements that support intellectual property security (Ibid: art 4). Regarding the intellectual property rights in plant varieties this organization “in close cooperation with the WTO secretariat, WIPO has been instrumental in the implementation of TRIPS standards in developing countries, often taking the opportunity to draft and recommend TRIPS-plus legislation” (GRAIN 2003: 2).

(iii) Free Trade Agreements (FTA)

Nowadays Colombia has 13 commercial agreements in force with US, Europe Union, Mexico, CAN, CARICOM (Caribbean Community), Chile, Canada, Cuba, Venezuela, Nicaragua, Mercosur, Switzerland and Liechtenstein and El Salvador, Guatemala and Honduras (MINCIT, n.d. a). Following the purpose of this research paper and taking into account that the main seeds transnational companies are based in US and Europe below are summarized the scope of this two commercial agreements on the breeders' rights topic.

Colombia - US: The FTA between US and Colombia enter into force in 2012 through the decree 993 after six years of the agreement on the text were the "standards for protecting Intellectual Property Rights were controversial in the negotiation of the agreement" (Maskus 2006: 145). As a result the chapter 16 contains the agreements about Intellectual Property Rights that establishes in the general provisions that both countries must ratify or accede the UPOV91 and follow also the WIPO agreements for patents and the articles 27.2 and 27.3 of TRIPS (Government of the United States of America and the Government of the Republic of Colombia 2012: 3-15). US has use the bilateral agreements in order to strength, at least to US levels, Intellectual Property Rights regimes in its partner countries. This FTA allow US to going beyond the TRIPS of the WTO and request more specific systems (Maskus 2006: 146) in this case the UPOV91 that must be ratified "either when the CTPA enters into force or on January 1, 2008, whichever is later" (ITAC-15 2006: 14). This requirement was evidenced through the enactment of the law 1518 of 2012 on April 13 of 2012 that ratified the UPOV91 and just one month later the FTA was implemented on May 15 of 2012.

Colombia- UE: This FTA approved in December of 2012 in its article 232 of section 7 about plant varieties establishes that the parties must ensure the protection of plant varieties following the UPOV 91 principles, "including the optional exception to the right of the breeder as referred to in Article 15(2) of such Convention" (The European Union and the Republic of Colombia 2012: 287). The article 15(2) is an optional exemption related with restrict the breeders' rights in order to allow farmers to save and reuse seeds on their own holdings (UPOV 1991), but this exception depends upon each country and must be taken into account the size of the piece of land, product, sown area, among others criteria and is only for its own use and cannot be sold to third parties.

4.3.5. Colombia – National Organizations

As is stated in the first chapter of this paper the modified seeds topic was brought into the agenda only in the last couple of years this is also reflected in the fact that there is only few national NGO that are fully involved in this topic. Grupo Semillas is one of the main national NGO that works directly in the use of Genetic Modified Seeds area and has been involved in different decisions around this topic. This NGO has focus since 1994 in the concept of food sovereignty in the rural areas making emphasis in the minority groups (Peasants, indigenous and afro) (Grupo Semillas n.d. a) in order to promote the biodiversity conservation and defense on their resources and production systems (Grupo Semillas n.d. b).

The actions taken by this organization has focused on the inclusion into the agenda of the economic, social and cultural effects that are caused by the use of modified seeds. The main tools in order to promote its objective have been national and international campaigns, local actions as events, forums and workshops, magazines and web dissemination, protests, support on citizen intervention and some lawsuits to governments decisions (Bonilla 2014: 44-53). Since the scope of this NGO is limited because its lack of economic resources and the existence of other similar national organizations, it has made international alliances with some INGO's as Swissaid, GRAIN, SSNC, Via Campesina and RALLT and with some local Universities. This alliances has helped to organize and participate in national and international events, gain experience, promote international involvement and support for its objectives (Ibid: 50-52). As a result Semillas “has succeed in positioning issues of food sovereignty and preservation of seeds biodiversity... and helped to consolidate the ‘Red’⁶²⁷” (Ibid: 62).

On the other hand there also has been influence of some none profit organizations as Agro-Bio that its objective is to “inform, educate, disseminate and promote agricultural biotechnology in the Andean region countries”⁸ (Agro-Bio n.d). That supports scientifically the use, production and commercialization of modified seeds and whose partners are Monsanto, Syngenta, Dow, among others

⁶ The ‘Red’ is the join of the different national and international actors involved in the defense of food sovereignty (Bonilla 2014: 41).

⁷ Original in Spanish: “han logrado posicionar el tema de soberanía alimentaria y conservación de la biodiversidad de semillas...ha ayudado a la consolidación de esta ‘Red’”.

⁸ Original in Spanish: “informar, educar, divulgar y promover la biotecnología agrícola moderna en los países de la región andina”

(Ibid). Besides Agro-bio is a member of CropLife, as it was said before is the main global agroindustry lobby that represents more than 90 companies, and among its global network belongs the National Business Association of Colombia (ANDI) and Campo Limpio (CropLife 2014).

Besides Agro-bio there is ACOSEMILLAS (Seeds Colombian Association) whose purpose is to “defend the interests of the seeds and biotechnology industry...[and] serve as a valid interlocutor before the private and governmental organizations at national and international level”⁹ (ACOSEMILLAS n.d. a). Among its member there are Monsanto, DOW, DuPont, Syngenta and Corpoica (ACOSEMILLAS n.d. b) and it collaborated and supported the legislation in Colombia of the UPOV78, and “processed together with the ICA the modification of the General Seeds Resolution... [through] the resolution 970 of March 10 2010”¹⁰ (ACOSEMILLAS n.d. c). Also it has to be taken into account that this association was member of the CTPBio between 1998 and 2005 along with the ANDI.

⁹ Original in Spanish: “defender los intereses de la industria de semillas y biotecnología...[y] servir como interlocutores válidos ante organismos gubernamentales y privados, a nivel nacional e internacional”.

¹⁰ Original in Spanish: “Gestionó junto con el ICA la modificación a la Resolución General de Semillas... Resolución 970 del 10 de Marzo de 2.010”.

Chapter 5 : Modified Seeds Governance Architecture in Colombia

Once the main actors have been identified and the relations among them established in the previous chapter the objective of this part is to put all the elements together in order to map out the governance model of the seeds market in Colombia and understand how has been this process and sketch its architecture. Gereffi and Mayer (2004) provides a governance architecture in a globalized world where can be identified and placed the different actors involved and where the states (Industrialized and developing) can be differentiated. These allows to settle the power relations and pressures that can be made from the different actors at different levels but for the purpose of this research paper the relations made by the authors between the different actors are not followed because they are established to understand how has been the public and the private governance responses in a globalized era focusing on a market governance perspective, which goes more towards a mainstream explanation than the approach of the Regulation School followed in this paper.

That is why in order to establish these relations is followed the institutional approach presented by Hollingsworth and Boyer (1998a) in its book 'Contemporary Capitalism: The embeddedness of Institutions' which gives the principal concepts and explanations that are used in this section to pursue this objective and follows the main arguments of the Regulation School but focusing more on the different governance process, instruments and actors in the 'nestedness'¹¹ of the economic activities at different scales of regulation.

Before starting with the analysis it is important to take into account that the economic activity is coordinated by institutional mechanisms. This coordinated mechanisms are constrained by the social context they are embedded in each study case and this embeddedness nature shapes the different forms of governance (Hollingsworth and Boyer 1998b). This means that the governance map out that is sketch in this chapter only applies for the specific Colombian social context and the seeds market conditions, and also has to be taken into account the restricted information for some of

¹¹ Nestedness: "means that subnational regimes, sectoral, national, and international logics are intertwined - with none being dominant - in a two-sided type of causality" (Hollingsworth and Boyer 1998c: 475).

the actors and relations along with the theoretical framework that was used.

First of all, has to be establish in which level of the society the economic coordination or governance is being used mostly. The authors defines four different levels of society: Regional level within a country, nation-state, transnational regions and global level (Ibid: 4). At the regional level in the seeds market case in Colombia there has been participation and involvement only in the last couple of years where some pressure has been made from the society to the national level (Local NGO's, farmers associations, Unions, farmers). On the same way on the third level has not been identified any dominant form of economic coordination that has affected the governance architecture. Then the main variations of the governance has been identified in the nation-state and global levels (US and Colombia state, and International Institutions) where the forms of the nation-state has changed as well as the international regimes. As it is stated in chapter 4 the change and influence of the international regime has caused the major changes in the form of the Colombian state through the enactment of legislation, promotion and structures that has affected the rest of the Colombian actors.

The coordinating mechanisms for economic coordination (Markets, hierarchy, communities, state, networks, associations, international regimes among others) are array by the authors in a general taxonomy of institutional arrangements that has two dimensions: Action Motive and Mode of Coordination. The action motive of the mechanisms can be leaded by self-interest or by obligation, this means that actors are guided by individualistic behavior in the transactions among them and in the others side actions are guided by commitment and obedience with social rules. On the second dimension there are two opposite modes of coordination, on one side horizontal coordination and on the other vertical. In the first one, coordination occurs among multiple and relatively equivalent agents with similar distribution of power meanwhile in the vertical coordination exists private or public hierarchical structures where the power distribution is unequal and occurs more towards principal and agent (Ibid: 8-9).

Taking into account this general taxonomy and following the position given to the actors by Hollingsworth and Boyer (1998b: 9-11) the different actors involved in the seeds markets case in Colombia can be placed in order to understand its interests, the mechanisms of coordination and the interaction among them. The seeds market and hierarchy (firms) guide their actions following their self-interests and because it is characterized for its oligopolistic compe-

tion relies more on the horizontal mode of coordination even though in the last years with mergers and vertical integration of firms have move towards vertical coordination. This market operates in certain social contexts that embedded their economic transactions and in this case are given by the country where they are settled, in this case two of the three biggest companies are settled in US, and by the country where they are entering, in this case Colombia. Those provide the rules, mechanism and incentives of the social context and its action motive are guided more towards obligation and present a vertical mode of coordination in the nation-state level. These actors (Market and States) are shaped and shapers by international regimes that act as mode of coordination in the global level whose actions motives are between self-interest and obligation and present a vertical mode of coordination, for this case the main international institutions that interact are WTO, the different bilateral agreements, World Bank and WIPO. At the regional level are the communities, some NGO's and the different Unions whose action motives are in between of their self-interests and social obligation, and whose mode of coordination is more horizontal because relies on equal power distribution, this conditions affects and have some influence in the nation-state level.

The positions of the different actors in the governance architecture are settled in a particular social system of production where the coordinating mechanisms perform and take into account that “economic coordination varies by territory, for social institutions are rooted in local, regional, national, or even transnational political communities with their shared beliefs, experiences, and traditions” (Ibid: 25). As has been analyzed in the previous chapters the seeds market is characterized by the improvement in technological innovation (Genetically modification of the seeds characteristics), the way how they can protect their intellectual property rights in order to recover their investment in R&D and reproduce capital, and the entrance to a new markets. In the Colombian case the change in the form of the state, the position within the international regime and the forms of competition has been central to allow the entrance of the TNC's in the country.

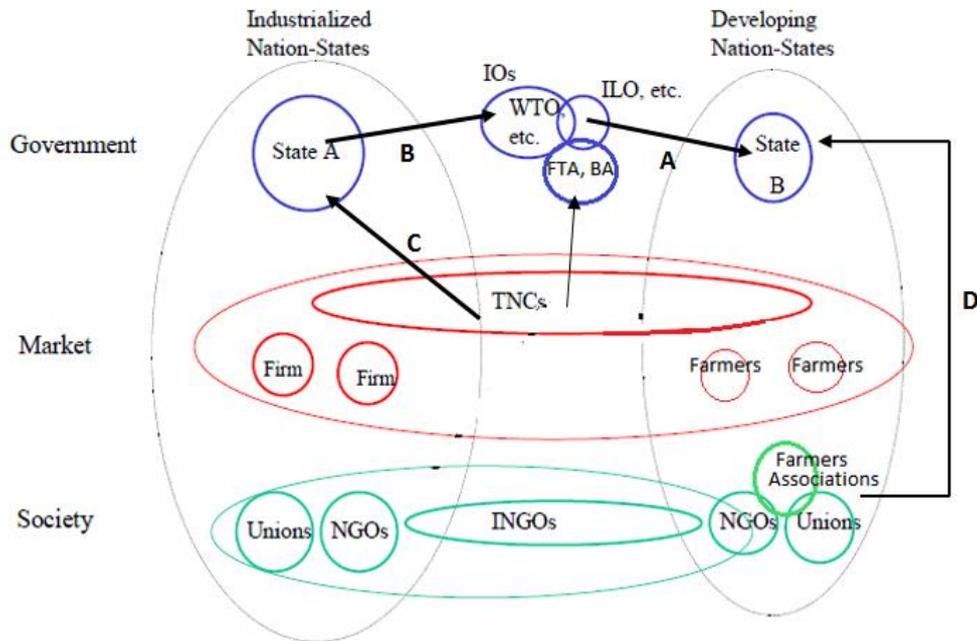
Since 1995 Colombia started the enactment of laws regarding the defense of the intellectual property rights for plant breeders first following the commitments made with the CAN- WTO and also directly with the WTO, that ended in the sign of the UPOV78 and the implementation of different TRIPS standards. Later on, the government has made different attempts to sign in the UPOV91 that is a requirement to implement the FTA with US and the EU

that Colombia has signed in the last couple of years (Arrow A in figure 4). But who is behind this requirements and pressures? As is stated in the methodology chapter the formal literature about the seeds market focus in the role of the US government and how it has influenced the implementation of the intellectual property rights in their partner countries. The US has played two roles in the implementation of the intellectual property rights in Colombia, first of all through its influence in the international institutions and in the international regime itself established after the Cold War and that has implemented a discourse towards efficiency, hunger eradication and raise of global nutrition. This has put technology as the key element to achieve this purposes, and has count with the support of the IMF and the World Bank and agendas as the Green Revolution and the Washington consensus. Second, US has pressure the Colombian government through its economic relations (Commerce and direct aid) and political support that had as an outcome the sign of the FTA (Arrows A and B of figure 4). But which are the interests of US about the implementation of this laws? The seeds and the chemical sectors contribute to the economic growth of the US and provide jobs, fiscal resources and capital accumulation what gives economical and instrumental power to pressure the US state. On the same line the US competitiveness of its social system of production relies on the firms, and “within certain limits, powerful countries can create international regimes that favors their firms and sectors and that encourage competitor nations to alter their productive systems” (Ibid: 38) Then the TNC’s can pressure the US state in order to accomplish their personal interest and in the same way to accomplish the economic interests and reinforce the social system of production of US (Arrow C of figure 4).

Even though it appears that the Colombian government has been hollowed out and that the has not room for maneuver in the recent years with the social manifestations the role of coordination between the global and the local levels the nation-state has been brought back into the model through the pressure made by the society and that has had as a consequences the suspension of the resolution 970 and the law 1585 of 2012 (Arrow D of figure 4)¹².

¹² The details about these relations and actors are analyzed separately in chapter 4.

Figure 4: Governance architecture of the seeds market in Colombia



Source: Diagram taken from Gereffi and Mayer (2004: 22), author own structure.

Figure 4 illustrates how has been the governance structure so far, the actors involved and the main relations between them in the certified seeds market in Colombia. It shows how the seeds TNC's have played an active and main role for open new markets and the defense of the intellectual property rights mainly through the pressure made to US government and to different international institutions as WTO, WIPO, IMF and World Bank. Then the Colombian state has been pressured mainly by its insertion to the international regime to accomplish the international standards and institutions related to the defense of the intellectual property rights where it has not had room for maneuver and negotiate. In the last couple of years some Colombian organizations and the society itself have pressured the government in order to stop the legislation about the use of modified seeds in the country especially for small farmers, but this is an open debate that is still analyzed by the government.

Chapter 6 : Conclusion

Taking into account the Colombian agrarian sector current situation and looking inside the changes that took place in the seeds market and the social manifestation that has brought this in the last years, this research paper asked *why and how particular actors have influenced the changes in the governance system in the certified seeds market in Colombia?* In order to answer this question the Regulation School was chosen among different perspectives as the VoC and TCE that even though they have instruments to establish the different actors involved in the process they focus more towards an economic perspective where their units of analysis is the firm and the transactions, respectively. Then the Regulation School allows the author to go beyond the market perspective and analyze non-economic coordinating mechanisms and institutions positioning them in certain time, place and history and taking into account different disciplines and dimensions that permit to establish the actors involved in the governance process through the analysis of the different institutional forms.

The Regulation Theory specifically through the analysis of the MoR of the modified seeds industry in Colombia gives the tools to analyze its development and which actors and institutions have been involved in it. In order to achieve this purpose the analysis centered in three institutional forms: The position within the international regime, Form of the State and Forms of competition. For the seeds case in Colombia the insertion of the country into the international regime, based mostly on neo liberal capitalism principles, and pushed by the recommendations of international institutions as the IMF, the World Bank and the WTO and behind them US and the TNC's, opened the country for the entrance of seeds TNC's and settled and enhance the mechanisms of defense of intellectual property rights. In order to position in the international regime the form of the Colombian state has changed to secure the preconditions and conditions for capital operation and coordinate the global flows of capital and the internal actors. Then the state implemented neoliberal politics following mainly the Washington Consensus, enacted the legislation for the defense of intellectual property rights, following primarily the UPOV78 and UPOV91, and promoted the use of modified seeds through state programs. Finally the forms of competition, characterized by the intensive use of technology, the vertical and horizontal integration and changes in market rules to protect their high invest in R&D, has guided the

TNC's to gain economic and political worldwide power in order to pressure its entrance to new markets, as Colombia.

The institutional forms analysis provided by the Regulation School allowed to establish the US government, Colombia government, international institutions (WTO, IMF, World Bank, WIPO), TNC's and some national organizations as the main actors involved in the governance process of the seeds market in Colombia. Furthermore, it allowed to identify some of their interests, powers and the main relations between the actors: a) TNC's and governments where the TNC's use their instrumental power and its lobby capacity to participate in the US policy making decisions and where revolving door cases have occurred; b) International Institutions and TNC's where the TNC's has influenced the International Institutions agenda about the use of technology to improve productivity, liberalization and defense of the Intellectual Property Rights; c) US and Colombia relation has been characterized by the Colombian economic dependency in the foreign trade with US, the financial AID given by US, the sign of different agreements, and the reliance as a political ally of US for Colombia; d) Colombia is member of multiple International Institutions that have influenced the state for the defense of intellectual property rights as the WTO with the TRIPS agreements, the WIPO and its promotion of TIPS-plus agenda, and the different FTA's that has as a requirement the sign of the UPOV91, furthermore it has to be taken into account the role that the IMF and the World Bank has played; e) National Organizations, mainly Semillas, has brought into the agenda the negative effects about the use of certified seeds and pushed the government directly or indirectly for its decision about this topic, and on the other hand organizations as ACOSEMILLAS and Agro-bio have been pushing the government about the benefits of modified seeds.

Finally the figure 4 settle the main actors and relationships inside the governance structure through an institutional approach. Here is identified that the seeds TNC's has been the main actor in the governance process of the modified seeds market in Colombia, where through the US government and the international institutions has opened this market. This is reinforced by the fact that these TNC's are the engine of the US economic power and its capital production and reproduction that is one of the ends of the capitalist mode of development. Then the US relies on these companies in order to keep its hegemonic and economic power into the international regime and preserve and stabilize its capital accumulation and reproduction.

Even though the case in Colombia share similar features with the rest of developing countries this results cannot be extrapolated to other cases, as is stated in the Regulation theory each case is analyzed in certain time, space and institutional configuration, then for further analysis this case can be compared with other countries situation in order to settle a global seeds market governance. Besides there is left the analysis of two of the institutional forms provided by the MoR, that could provide further explanation about the entrance of the seeds market in Colombia through the incorporation of the forms of monetary constraint and the conditions of the wage relation.

Furthermore, this case has not over and the legislation of the entrance to the UPOV91 is still on the table. Then the evolution of the governance structure will depend on the results, pressures, and achievements of each of the actors, where the state is going to play a central role as coordinating mechanism of international pressure and civil society demands. So far this pulse has move towards the international regime were the US does not accept the changes in the conditions of the FTA and where resolution 970 draft has not changed the main demands made by the civil society.

In addition to this paper contribution to the understanding about the governance structure of the modified seeds market in Colombia, it pushes and approaches from a different perspective the methodology, method and concepts of the Regulation Theory in order to understand and analyze a single market instead of a mode of development. Furthermore, it helps to approach the analysis of the school towards the characteristics and conditions of the 'undeveloped' countries that usually are not taken into account inside the theory and designs its tools and concepts based on the advanced modes of production. Then the method used here could help to understand different markets changes in 'undeveloped' countries through the main concepts and theoretical framework of the French Regulation School.

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