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Considerations on Hemp and Alternative Agriculture in Italy, France and Russia from the Seventeenth to the Nineteenth Century

I. Introduction

Extensive cereal growing and meat production have been characteristic products of mainstream agriculture in the history of western societies. When prices grew stagnant in the grain market, farmers managed by switching to new crops and growing methods, that is, to 'alternative farming'; these choices eventually determined innovation in production and processing. Within this framework, the fall of wheat and meat prices did not necessarily result in an overall slowdown, but could on the contrary be a force actually pushing towards diversification and more effective use of available resources. Cereals and meat could for example yield ground to industrial crops, such as hemp and flax, dairying or horticulture. Nor this has been a temporary trend. Once the normal conditions of grain profitability returned, the experience encouraged advances in the form of more complex rotations, innovative use of labour potential, and wider supply and access to the market (Thirsk, 2006).

Historical evidence shows however a more complex picture. Mixed agriculture, for instance, far from resulting from external shocks, has been for centuries the most common form of soil use. Farmers tended to produce a wide range of outputs including cereals, textile fibres, vines, vegetables, and livestock. Eventually they adapted the overall mix to actual market requirements. Enlarging the variety of crops was both a risk-reduction strategy, compensating for diverging price trends and production outcomes, and a means to self-sufficiency, as the case of mainstream agriculture in the eastern Po Valley, based on the so-called 'piantata' (Scarpa, 1963).

The actual mix of production chosen hinged on a complex range of factors. Environment, social conditions of production, the organization and division of labour, institutions, skills, tradition, commercial networks, and external demand all played an important role.

Drawing on these categories of analysis, this paper aims to verify empirically whether industrial crops can actually be considered alternative crops, taking hemp as a case study. In doing so, the study focuses on the three major European producing areas (Western France, Eastern Po Valley, and Central Russia), testing whether, and to what extent, the development of the textile plant in early modern and modern period can be linked to major offsets of the cereal market, and whether, on the other hand, the crisis of hemp production in the

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late nineteenth and early twentieth century was the result of any long-term rise in grain prices.

Wheat prices display broadly similar tendencies in the selected regions. They showed continuous growth all through the eighteenth and early nineteenth centuries until the end of the Napoleonic wars; a more or less sharp drop in the decade following the collapse of the French Empire; and a new expansion between the 1830s and the 1870s. Thereafter France and Italy suffered the consequences of the so-called 'agrarian crisis', whereas in Russia wheat prices kept rising until World War I (see Figures 7-12 1-6). Hemp production in Western France continued to expand up to the 1880s and, in North Eastern Italy and Central Russia, until the first decades of the twentieth century.

Regional case studies have been selected because of the relevance of the local hemp crops within diverse economic and social frameworks, and asymmetrical exposure to market forces. These aspects allow us effectively to test the existence of a correlation between long-term falls in wheat prices, and expanding hemp cultivation. In fact, the presence of this fibre within traditional field rotations made it easier for tenants to shift from one crop to another, making hemp a particularly favoured alternative when the cereal market was in decline. Secondly, the structural differences in economic and social conditions between the selected regions helped isolate them from each other, which makes it easier to test for the presence of the correlation. Finally, the chronological span, from the seventeenth to the early twentieth century, encompasses the main ups and downs of wheat prices (see Figures 14.8-14.13) and the considerable development of hemp cultivation through the entire eighteenth and early nineteenth centuries, as well as the subsequent general crisis of hemp production in the world market.

The article is divided into three sections. It reconstructs the origins of hemp production in each region and its evolution over time, the factors that marked the sector's development and crisis and any correlation between trends of wheat prices, and those of hemp harvests. The conclusion presents a comparative synthesis of the results.

II. Hemp and Sharecropping. The Eastern Po-Valley

There has been extensive research into the history of Italian hemp growing. A number of mainly regional studies – we refer e.g. to the works of Giacomina Caligaris for Piedmont, of David Celetti for North-Eastern Italy, of Roberto Finzi, Carlo Poni and Agostino Bignardi for central Italy, and of Anna Dell'Orefice for the Southern Italy – have systematically traced the origins, growth, and final crises of hemp cultivation, and manufacturing. Among other aspects, they highlighted how the textile crop played a central role in Italian rural history. While drawing on insights from these works, the focus here will be on the province of Bologna, the major Italian hemp-producing region. We will examine, in particular, the factors that explained why this

choice continued to be made through hard times, so that hemp survived as a mainstream crop until the mid-twentieth century.

Hemp was traditionally a keystone of the regional economy. The quality of the raw material enjoyed international reputation. Naval dockyards and shipyards preferred Bolognese fibres to all others. Bolognese yarns and cloths were exported to the rest of Italy (Poni, 2005: 1-16), Northern Europe[1], and to the whole Mediterranean area (Marcelli, 1962: 323). Up until the 1930s hemp retained remarkable market strength, even though its cultivation had been reduced to marginality in most Western countries (Sessa, 1934: 669).

Hemp was common in Central Italy already in ancient times. Until the early fifteenth century, however, the fibre was mainly used for home consumption or marketed within regional networks (Sorbelli, Bologna: 1910). Farmers and artisans alike made sheets, cloths, ropes, and bags from hemp. As such, the plant fitted well into traditional rural life. It did not change the usual crop rotations based on cereals and legumes, nor did its output exceed the limits set by local needs. Cultivated in small plots, usually located near the cottage, hemp was tended by women and children among their other tasks. As it was spun and woven during the winter, it occupied people who would otherwise have been left unproductively idle (Andreolli, 2005:1-16).

In the early Renaissance, merchants, in response to the needs of the booming shipping industry, began selling hemp fibre in the ports of the nearby Adriatic. By the fifteenth century growing demand for hemp to produce ropes and sails had already triggered the expansion of planting, and transformed this crop from a secondary activity into a promising business. Now closely linked to one of the most important and rapidly growing industrial sectors of the time, the fibre became item of international trade (Neppi, 1899: 193).

The market was promising, yet complex and highly competitive. To deliver adequate quantities, peasants had to increase productivity, which they did by inserting hemp into a three-year crop rotation with wheat (Zangheri, 1957: 503). This, in turn contributed to profound innovations in mainstream agriculture. The expansion of industrial crops showed that overall yields could be enhanced by introducing different methods of cultivation, eventually stimulating product and process innovation. It also highlighted the benefits of new rotations, of intensive manuring, and of deep plowing (Tanari, 1881: 164, 167-170). Extensive hemp plantations were however radically different from the traditional ones in scale, scope, and organization. They required heavy investment to build canals, retting pools, and warehouses, and needed large cash advances for buying fertiliser. This crop also became a very labour-intensive option: a large work force was needed to plough the fields, and for sowing, harvesting, and retting. Hemp tended therefore to be cultivated on big estates,

1 Bolognese hemp reached the Baltic, where it was preferred to Nordic and Russian fibers for its smoothness and elasticity; see Landeshauptarchiv Schwerin (hereafter LHS), 2.11 – 2/1, 207, 305, 1203, 1211, 1562, 3035, Auswärtige Beziehungen.

usually run on the basis of sharecropping contracts, the most common form of rural lease in the region[2].

The introduction of large-scale hemp cultivation profoundly altered the inner relations between capital and labour. The choice of this crop in fact proved a particularly advantageous option for the proprietor, one that substantially increased his share of overall revenue (Poni, 1963; Mirri, 1970; Iradiel, 1978). All things being equal, enlarging the area under hemp raised both the added value and the variable costs. Farm income under sharecropping was split evenly between landowner and sharecropper, but although direct costs were borne by the peasant, extensive hemp cultivation worked against the landholder. Managing the work force, in particular, turned out to be a challenging problem. The most labour intensive tasks like ploughing, sowing and harvesting were concentrated in a relatively short time-span, and, as a rule, they overlapped with other field tasks. Any disruption of the production process, such as a reduction of available time by bad weather, increased the amount of labour needed beyond the capacity of the rural family. Hiring day-labourers then became a necessary, but also risky, alternative. Failure to take that step put the harvest in danger, and the tenants at risk of eviction. But employing an external work force meant paying salaries. If the tenant did not have the cash he needed, he was forced to turn to the landowner for an advance on the future harvest. At the end of the year, the landholder was required to pay back the loan, leaving the landlord with a higher share of the added value (Finzi, 1998). Any unforeseen event such as higher labour costs, a drop of hemp prices or new taxes would have transformed the advance into a debt. Once indebted, the landholder had to comply with the proprietor's every whim, losing ever more added value, and ultimately becoming economically and personally bound to the landlord (Finzi, 1984: 472-488).

Expanding hemp cultivation, sharecropper indebtedness, and the soaring profits of agrarian capitalists worked as tightly integrated variables (Poni, 1970; Biagioli, 1991). Innocenzo Malvasia, in his writings on agriculture, farming, and field management at the beginning of the seventeenth century, had already outlined those mechanisms, explaining clearly why landowners should expand hemp cultivation to the full (Finzi, 1079; Avellini, 2007; Malvasia, 1609). Analysis of nineteenth-century accounting documents confirms that hemp was not just a profitable agricultural option, but also a strategic tool of labour management in the hands of the landowner, as the plant presented the double characteristic of giving the proprietor maximum revenue while leaving the landholder with a net loss. Table 14.1 brings together the contrary effects of hemp growing on labour and capital. It also explains why the hemp question remained central to the eternal struggle between sharecroppers and proprietors, the former striving to hold back the spread of the plant, the latter using all possible mean to promote its expansion. By way of conclusion,

2 Archives Nationales (hereafter AN), F/12/502, Notes sur le chanvre de Bologne.

the continual development of hemp planting shown in Table 14.2 and in Figures 14.1 and 14.2 is a sure sign of rural capitalism's long-term success in this part of the Italian peninsula (Celetti, 2009: 33-78).

The evidence shows no correlation between trends in wheat prices (Figures 14.1, 14.8 and 14.9) and those of hemp cultivation (Figure 14.2), and it is clear that in the context of the relations of production that shaped the local agricultural economy, the textile plant did not expand as a result of cutbacks and crises in the wheat market. Rather it succeeded mainly because landowners worked to enlarge the surface area devoted to this crop.

Table 14.1. Production, revenue and sharing of the added value between land-owner and land holder (Average of the years 1866-1870, in £).

Crop	Costs/hectare			Revenue/hectare			Net Product/hectare		
	Total	Land owner	Land-holder	Total	Land owner	Land-holder	total	Land owner	Land-holder
Hemp	735.29	233.21	502.08	961.50	480.75	480.75	226.21	**247.54**	**-21.33**
Corn	224.15	69.34	154.81	359.50	179.75	179.75	135.35	110.41	24.94
Clover	162.00	47.25	114.75	485.00	242.50	242.50	323.00	195.25	127.75
Wheat	378.06	136.91	241.15	555.10	277.55	277.55	177.04	140.64	36.40

Sources: C. Poni, 1963: 85-87, Tables 14.8 and 14.9 and author's calculations.

Table 14.2. Annual Hemp Production. Province of Bologna (1819-1852)

Year	Quintals	% var.	Year	Quintals	% var.	Year	Quintals	% var.
1819	64,937.40		**1831**	70,921.20	47.65	**1843**	103,820.20	
1820	48,622.10	-33.56	**1832**	81,382.50	12.85	**1844**	99,921.60	-3.90
1821	74,653.50	34.87	**1833**	67,615.20	-20.36	**1845**	63,912.90	-56.34
1822	52,988.60	-40.89	**1834**	64,784.60	-4.37	**1846**	103,053.80	37.98
1823	59,446.20	10.86	**1835**	68,439.60	5.34	**1847**	56,491.70	-82.42
1824	77,987.80	23.78	**1836**	60,714.80	-12.72	**1848**	102,177.20	44.71
1825	80,024.20	2.54	**1837**	89,114.10	31.87	**1849**	77,401.00	-32.01
1826	75,250.50	-6.34	**1838**	83,580.20	-6.62	**1850**	68,307.40	-13.31
1827	64,453.30	-16.75	**1839**	83,480.90	-0.12	**1851**	92,032.90	25.78
1828	60,957.30	-5.74	**1840**	87,643.60	4.75	**1852**	97,509.80	5.62
1829	67,436.70	9.61	**1841**	90,978.40	3.67	**1853**		
1830	37,124.20	-81.65	**1842**	72,680.80	-25.18	**1854**		

Source: M. Martini, 2000: 395 and author's calculations.

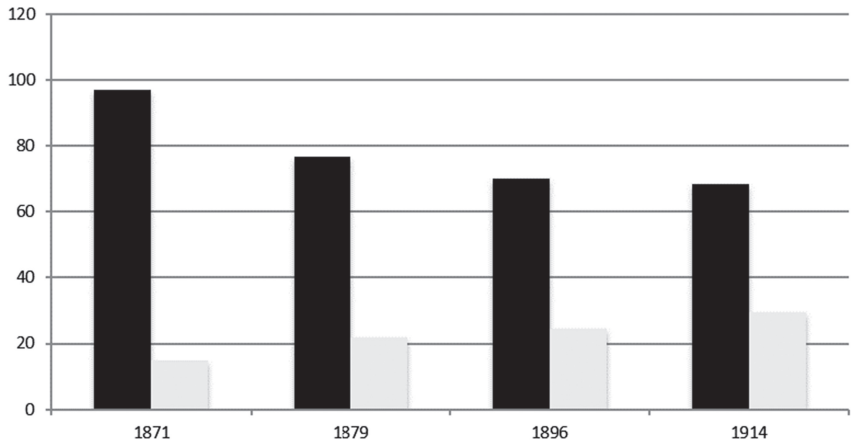

Figure 14.1. Price of hemp (black) and wheat (grey) in Bologna, 1871-1914

Sources: Ministero dell'Agricoltura Industria e Commercio (hereafter MAIC), Movimento dei prezzi di alcuni prodotti agricoli, Roma 1881 and 1915; author's calculations.

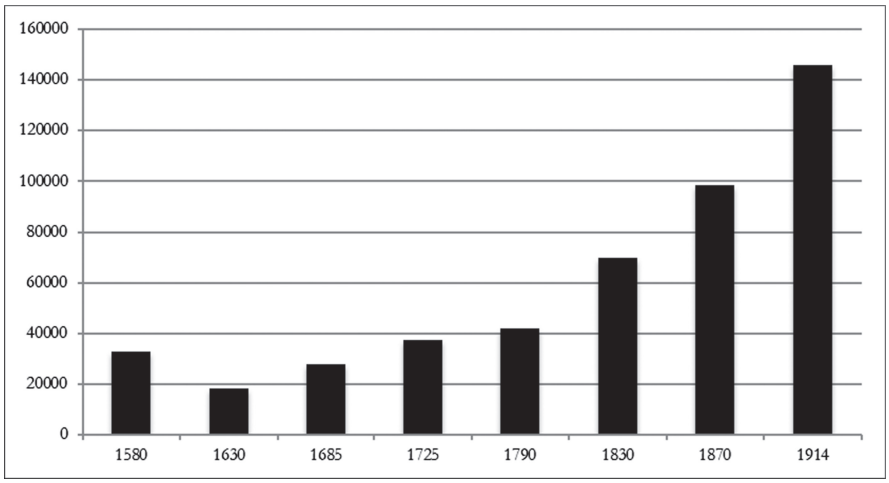

Figure 14.2. Hemp production in Bologna, 1580-1914 (quintals)

Sources: Celetti, 2008; Capasso, 1994 and author's calculations.

This is all the more evident when we note that hemp production kept expanding even as the difference between hemp and wheat market prices was gradually being reduced (Figure 14.1). Rather than an alternative crop, textile fibre emerges as a mainstream agricultural option characteristic of the province from the early fifteenth century down to the Second World War, a choice deeply rooted in local relations of production, and with little, if any, correlation with cereal price trends.

III. Hemp and Farming. The *Généralité* of Tours

There is still no comprehensive study on the history of hemp in France. It appeared in ancient times, when it was used above all for rope making (Hoefer, 1850: 132). After the fall of the Roman Empire, it remained a widespread, but marginal crop, limited mainly to local needs and consumption (Catalogue Exposition, 2000). As in many European countries, its production grew rapidly from the seventeenth century onwards, chiefly in response to naval demands (Créateur, 1998: 30-37). The new market conditions pushed up production and at the same time increased territorial specialization (Pigousset, 1984: 1-7). In certain areas hemp became an important product, sold to navy arsenals and shipyards, while in others it remained a secondary crop (Renouard, 1885: 353-540).

In its search for readily available strategic resources the French government took surveys of hemp cultivation from the late seventeenth century onwards[3]. It emerged that the main production regions were Brittany, Picardy, Champagne, the Soissonnais, Burgundy, Dauphiné, Haut Valentinois, Bresse, Poitou, Anjou, Maine, the Nivernais, Berry, the Gâtinais, and Auvergne. Picardy, Normandy, Brittany, Poitou, and Anjou furnished the Atlantic ports. Aquitaine and Languedoc sold chiefly to the naval dockyards at Marseille and Toulon. Alsace was linked to the Atlantic shipyards, even though most of its production was taken up by local demand and by the shipyards on the Rhine (Monguilan, 1989: 35-53). At the beginning of the nineteenth century the overall picture had changed little. The enquiry of 1811 on the state of the Empire identified 25 areas of intensive hemp production, with average harvests of more than 4,000 quintals a year (Table 14.3)[4].

Table 14.3. *Départements* producing more than 4,000 quintals annually (1811)

Aisne	Escaut	Lot et Garonne	Sarthe
Aube	Ille et Vilaine	Oise	Somme
Cote d'Or	Isère	Puy de Dôme	Stura
Côtes du Nord	Marengo	Bas Rhin	Trasimene
Ems Superieur	Meurthe	Haute Saône	Haute Vienne
Total Production (Quintals)		317,900	
Value (Francs)		25,452,000	
Average Production (Quintal)		12,716	

Source: Ministère de l'Intérieur – Situation de l'Empire en 1812 and author's calculations.

3 See e.g. the Enquête sur les chanvres preserved at the Archives Départementales des Bouches du Rhône C 2360, or the Mémoire sur les chanvres d'Alsace (1757), Mémoire sur les chanvres (1766), Mémoire sur les chanvres en France et les chanvres d'Alsace (1777), Projets pour la culture et l'encouragement de la culture du chanvre (1779), Sur la culture du chanvre en France (1793) preserved at the AN, Mar, D^3 24.

4 AN, F 10/412, État des cultures de lin et de chanvre. Recensement des chanvres, all aiming to define the conditions and perspective of hemp cultivation in France.

Table 14.4. Uses of French Hemp (1811)

Quintals	Percentage	Manufacture	Value of the Raw Material (Francs)	Added Value (Francs)	Value of the finished product (Francs)
200,000	33.23	Ropes	16,000,000	11,600,000	27,600,000
250,000	41.54	Cloths and yarns	20,000,000	18,400,000	38,400,000
151,809	25.23	Fine and mixed cloths	12,144,720	29,060,496	41,205,216
601,809	100.00	/			

Source: Ministère de l'Intérieur - Situation de l'Empire en 1812 and author's calculations.

Output at that time reached 601,809 quintals. The fibre was used mainly to produce sailcloth and ropes; only one-quarter of production went to weaving fine or mixed hemp and linen cloth (Table 14.4).

Until the end of the seventeenth century domestic production more or less sufficed for national demand. As late as 1690-1691, the harvests of Auvergne, Touraine, and Brittany met the needs of the Brest and Rochefort naval dockyards, local artisans and other Atlantic shipyards. But by the next decade, France had to turn to imports to satisfy its needs (Rey, 1840: 3). Baltic (Pourchasse, 2006: 390; Beaurepaire, 2010: 501)[5], Russian[6] and Italian[7] hemp flowed into the country, to make up for structural shortages (Rey, 18340: 1). After the Napoleonic era, the decline of warship construction, competition from cheaper Asian fibres and, by mid-century, the gradual replacement of sail by steam power caused demand for hemp to wane, which in turn gradually turned the textile plant into a marginal crop (see Figures 14.3 and 14.4; Boulen, 2012: 19).

The old administrative unit known as the *Généralité de Tours* (carved up after 1789 into the *Départements* of the Maine-et-Loire, Indre-et-Loire, and Sarthe) emerged however as a bright exception in a dismal picture. In that area in fact, hemp showed remarkable strength and competitiveness all through the late nineteenth century, whereas at the national level a crisis had already been reached in the early 1870s (Figures 14.3 and 14.4). The reason for this difference could be only partially attributed to the region's higher productivity, somehow compensating for its falling monetary earnings; neither can it be found in diverging trends of wheat and hemp prices (Figures 14.5 and 14.6). It is rather to be sought once again in the peculiarity of local economies, and specifically in the particular role that the plant played as a source of agricultural

5 AN, Mar, B¹ 48, Commerce avec la Baltique.

6 AN, B/1/84, fol. 298 Mémoire et proposition de commerce avec la Russie; AN, AE/B/I, fol. 213.

7 AN B/1/ 502, Notes sur le chanvre de Bologne.

and manufacturing income. To understand the nature of this link we have to go back to the origins of local hemp cultivation.

Although grown since the Middle Ages, the plant until the seventeenth century was used only for local consumption, and to satisfy the needs of village artisans, rope-makers, and weavers. In 1660s Charles Colbert de Croissy, brother of the renowned Controller-General Jean-Baptiste Colbert, visited the *Généralité* in search of ways to increase strategic production to meet the needs of naval industry. He was favourably impressed by the region's potential. He pointed out its advantages of climate and soil. He stressed the opportunities presented by the abundance of water supplies, labour, and skilled farmers. But above all he underlined the synergies between agriculture, and manufacturing. Farmers would earn extra income by spinning and weaving their own fibres. This, in turn, would help them overcome the difficulties of labour and capital-intensive cultivation, and the plant would ultimately find a permanent place in the local economy. He therefore proposed to support the development of yarn and cloth manufactures so as to get peasants to fit hemp into their normal crop rotations. Part of the raw material would be sold to naval dockyards, part of it spun and woven at home. Industrial revenue would round out agricultural income. Hemp and hemp-related activities would thereby become more profitable than any other crop.

On 3 March 1667 the inhabitants of the *Généralité* were officially granted permission to manufacture hemp yarn, and cloth, a decision that really did constitute the starting point for the long-term development of the sector. The production of raw fibres, and textile production soared year after year. Agriculture and manufacturing, market and farm consumption had been tied into a virtuous cycle of mutual support.

After fifty years, hemp production was so deeply rooted in the territory that the demands of agriculture, cottage industry, and the naval dockyards were easily met by harvests. These surpluses opened new industrial opportunities. By 1730 three *manufactures* were founded to produce a hemp cloth called *bougran* using only yarns spun in the region. In those years a new survey led by Charles Pierre de Savalette confirmed the progress made by the entire hemp sector. Yields were abundant. Spinning wheels and looms were present in almost every household, and shops supplied high quality, competitive cloth (Boulen, 2012: 19).

A further step forwards was granted with the creation in 1761 of the local Agricultural Society. Its secretary, François Louis du Verger, fully committed himself to supporting the development of better agricultural practices. He was convinced of textile's potential to generate extra income for a large part of the population. It is therefore not an accident that the first surveys promoted by Du Verger dealt precisely with hemp, and were meant to stress its positive effect on the whole rural economy. They pointed out the benefit of sowing the plant in open fields, in a three-year crop rotation with cereals. Wheat gained from cleaner and richer soil, hemp from a fully reconstituted soil structure. Hemp and cereal rotation gave higher cereal productivity than any other

option. A *journal* sown with hemp yielded 200 kilograms of raw fibres, which corresponded to 160 kilograms of yarn, and allowed a gross revenue of 256 *livres*. After having paid the rent and the taxes, a landholder working according to a methodical scheme made a net profit of about 50 *livres*, which, in turn, would make an essential contribution to the well-being of a rural household. All the more so, as the survey pointed out, in that even when leases allowed landlords to take hemp as part of the rent, they also guaranteed that a fair part should be left to the peasant, allowing him to spin and weave both for home consumption and the market. In the *Généralité*, hemp therefore actively contributed to household budgets (Gouget, 1907: 4).

The enquiry of 1789 confirmed the advances made in the sector. In Maine, more than 7000 weavers grew hemp on a regular basis. Most of them used their own yarns, and brought the cloth to government registry offices (*bureaux de marque*) where it was inspected prior to stamping. Overall production was valued at more than 4 million *livres*, which made the region's industry the second most important in the country, after Brittany (15 million *livres*), but ahead of Anjou (3 million *livres*). The economic significance of the sector was obvious. Its social relevance, however, was by no means less so. Widespread hemp cultivation and engagement of the local population in spinning, weaving, and in a whole range of related activities such as cleaning, grinding and transporting, made it a breadwinner for many. All this gave hemp, and hemp-related activities, a position that endured long after the textile plant ceased to be a competitive option (Gouget, 1907: 4).

The crises of the late 1780s and early 1790s, the Revolution, and the related upheaval and political transformations did not harm the sector. On the contrary, in those years it set out on a new path of growth that was consolidated during the Napoleonic period. Revenue from the 'manufacture' rounded out incomes, compensated cyclical fluctuations of other crops and contributed to stability and relative wellbeing of the entire local society[8]. Though hemp cultivation was particularly well established in the Maine region, the overall trend there much resembled the national pattern. French hemp cultivation, in fact, kept growing all through the first decades of the nineteenth century, reaching its peak in 1841 with more than 176,148 hectares. By 1852 however, the surface area it occupied collapsed to 125,357 hectares on the national level, and by 1862 to just 100,000 hectares. Even if this was partially made up for by higher output per field, the trend nevertheless clearly shows a sector in a terminal crisis. Competition from imported fibres, the widespread use of cotton and the substitution of steam for sail reduced demand. Falling hemp prices reduced profit margins. Farmers reacted by looking for other options, and cut the area devoted to hemp cultivation by half over twenty years (Figures 14.3-14.6).

This was by no means the case however in the old *Généralité de Tours* (Brouart, 2010: 49). In the Department of the Sarthe, one of the three new

8 AN, F 10, 412, Etats des productions de chanvre et de lin, 1811.

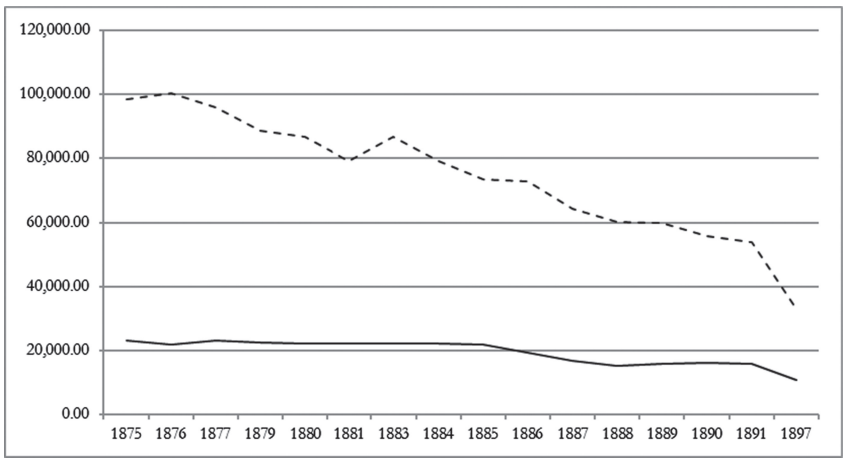

Figure 14.3. Hemp cultivation in France, 1875-1897 (hectares)

Source: Annuaire Statistique, 1875-1900.
Solid line: Département of the Sarthe; dashed line: Indre-et-Loire and Maine-et- Loire

administrative areas carved out of the Old Regime intendancy, 3000 hectares were sown with hemp in 1811, 8000 in 1837, 10,500 by 1856, and 12,000 by 1866 when there were 6000 active looms, and 60 % of the male population was involved in weaving. Every weaver thus counted on the work of at least ten spinners, which underlines the number of people engaged in hemp related activities, as well as the role of women and children in the sector. In the Department of the Maine-et-Loire, the crop was grown on 6851 hectares in 1837, 7710 in 1852 and 9552 in 1862. In the Indre-et-Loire the plant kept expanding until 1852, when it occupied 2585 hectares. At the eve of the First World War the three Departments accounted for more than 23.3 % of the national production, the area under hemp had shrunk a little, but this was made up in part by higher productivity (Figures 14.3-14.6).

Questioned in 1893 on the reasons for such a contrasting trend, the local Agricultural Society pointed to several factors, including tradition, know-how, infrastructures, networks of domestic and international markets, and the active role of the Society itself. Above all, however, it stressed the importance of the synergies between agriculture and manufacturing within an agrarian context dominated by independent producers and medium-sized farming. Hemp allowed full use of the family work force, partially compensating high production costs by using unpaid labour on a large scale. Shrinking domestic demand and falling prices in national and foreign markets were then balanced by earnings from domestic spinning and weaving. Farmers did not sell only raw fibres but also yarns and cloth. Giving up hemp cultivation would have greatly affected total household revenue, endangering an otherwise solid and resilient equilibrium. Higher incomes, possibly obtainable from other crops,

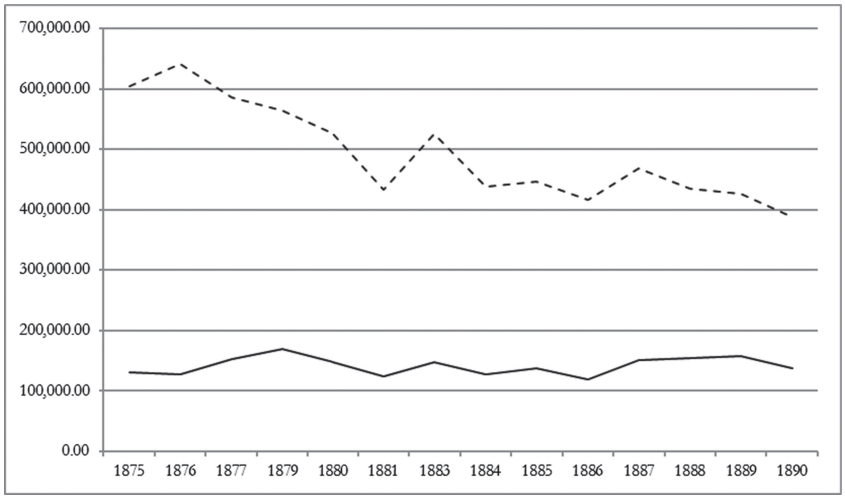

Figure 14.4. Hemp production in France, 1875-1897 (quintals)

Source: Annuaire Statistique, 1875-1900.
Solid line: département of the Sarthe; dashed line: Indre-et-Loire, Maine-et-Loire.

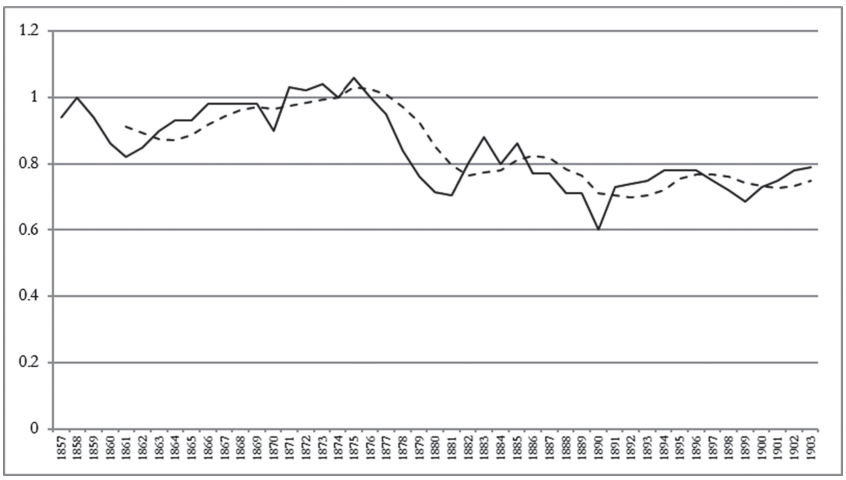

Figure 14.5. Hemp prices in France, 1857-1903 (Francs/kg)

Source: Annuaire Statistique, 1875-1900.
Solid line: annual prices; dashed line: 5-year moving average.

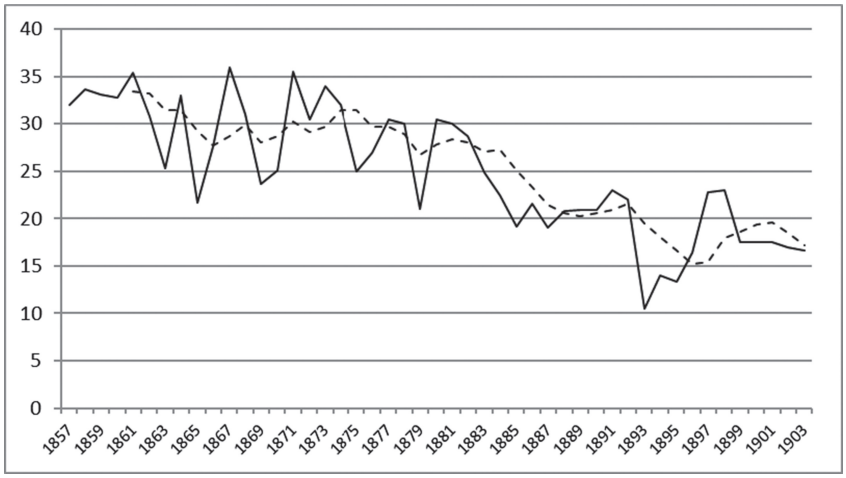

Figure 14.6. Wheat prices in France, 1857-1903 (Francs/quintal)

Source: Annuaire Statistique, 1875-1900.
Solid line: annual prices; dashed line: 5-year moving average.

and actually achieved by the upward trend of wheat prices after 1895, would have in fact been at least offset by a fall in revenues previously obtained from the sale of yarns and cloth.

The case study shows that even in the French case the choice to grow hemp, and the long-lasting presence of the plant among traditional local crops, cannot be explained by declining trends in wheat prices. This option must rather be analysed as part of a much more complex set of economic and social variables. These elements, acting together, pushed the boundaries of the actual profitability of hemp beyond the limit set by comparative prices of alternative harvests. The use of self-produced hemp for domestic spinning and weaving, in particular, emerges as a central factor explaining the fibre's success as well as its resistance to external downward trends and shocks. This had already become a relevant aspect of hemp growing in the seventeenth century and it greatly helped fix the cultivation of the fibre in local economy and society. Hemp became the cornerstone of a complex production system that was only disrupted when the market for domestic natural fibres, and rural economies in general, were drastically transformed after the First World War (Le Cherlès, 1998: 182).

IV. Hemp and Serfdom. Western Russia

Hemp appeared in Eastern Europe and Russia well before it was noticed in the western part of the continent. In the Second Century B.C., the plant was already widely present around the Caspian Sea, the Aral Sea, along the

course of the lower Don and Volga rivers and on the shores of the Black Sea (Hehn, 1984: 188). The latter emerged in the high Middle Ages as a leading hemp producing zone and an active exporter of fibres to Europe and to the Near East (Skrzinskaja, 1968: 4-45). The city of La Tana (modern Azov) grew to become the principal centre of hemp exports to Italy and Spain, maintaining its position until the mid-fifteenth century, when the Turks cut it off from the maritime shipping routes that linked it to the Mediterranean[9]. Black Sea hemp continued to supply Ottoman naval dockyards. Its persisting importance was incidentally underlined by early nineteenth-century French attempts to open a land trade route to import fibres from Azov, and bypassing British sea patrols[10]. From Southern Russia and Ukraine, the plant spread to the north and westward. In the ninth century hemp was widely cultivated in the whole region between the Volga, Oka and Don rivers, both east and west of Moscow, already foreshadowing the geography of production in Early Modern, and Modern times (Table 14.9).

Hemp, however widespread, was mostly grown for domestic consumption and local markets until the early sixteenth century, when traders started exporting fibres to Europe in response to pressing demand from booming naval industries in the West. Specialized trading centres arose to link growing demand to scattered supply. The clearest example is that of the city of Valogda. That centre was strategically situated at the centre of the road and river networks linking Archangelsk, Russia's main northern harbour at the time (Delavaud, 1912: 313-332; Kraatz, 1983), to the chief areas where raw hemp (Nizhny Novgorod and Simbirsk Governorates), and linen (Vladimir Oblast') were grown (Volkov, 1983: 194). The influence of thriving international trade became ever more pronounced during the seventeenth and eighteenth centuries, when it absorbed the bulk of Russian fibres, transforming national production into a largely export-oriented sector. Seeing a good chance to make money, landlords began growing hemp extensively, using three-year crop rotations, thereby reproducing models already tested in sixteenth-century Central Italy, and in late seventeenth-century Western France. Meanwhile, the sector became more regionally concentrated within relatively restricted areas, aided by both a favourable environment, and the presence of a vast servile population[11]. The governorates of Kaluga, Kursk, Mogilev and Orlov, extending west of Moscow to what is now the Ukrainian frontier, and those of Simbirsk

9 AN F/12/502, Notice sur le commerce de Odessa; Id., 514, Rapports de voyage de Odessa au Levant.

10 AN F/10/412, Manière d'approvisionner par la Mer Noire le port de Toulon en mâture, chanvre et cuivre, 10 pluviôse an 12 [31 January 1804].

11 Sources point out that although hemp was widespread across the entire territory between Smolensk and the Black Sea, it was grown most intensively in central Russia, whereas flax was concentrated much more in northern Ukraine and the Baltic area (Anon., 1778; Kessler, 2014; Mironov, 1992: 457-478).

and Nizhny Novgorod, bordering on the linen region of Vladimir, to the east of Moscow, contributed more than half of Russian production in the mid-eighteenth century (see Table 14.9)[12].

Though intense, this trend did not change the traditional role of the plant within peasant communities, nor its use in domestic consumption. On the contrary, traders made use of peasants' spinning and weaving skills, and fitted their activity into broader commercial networks, extending the country's overall production of raw hemp and diversifying textile supply with linen and finished products. Specialised growing existed side by side with marginal village plots, and on the parts of estates occupied by peasants, where fibres were produced and transformed for direct use by the household. Having drawn home manufacturing into the market, merchants gradually organised it on a proto-industrial basis, concentrating weaving and finishing in shops and buying yarns directly from home-spinners (Besset, 1982: 197-219; Kotilaine, 2005: 611).

Thus by the early eighteenth century hemp offered an extremely attractive business opportunity for landowners, entrepreneurs and traders alike. It also played a central role within peasant communities, as spinning and weaving provided an integral part of agricultural income, contributing substantially to households' subsistence; and local textile workshops offered genuine opportunities for work (Tichonov, 1960: 3-15; Hellie, 1999).

Even though expansion of the sector was export-driven, the long-term success of Russian hemp cannot be fully explained without taking into account both the peculiar characteristics of the servile economy and the role of the textile fibre within the village and the household economy mentioned above (Soloviev, 1989). Serfdom was the backbone of Russian agriculture for it granted that there would be a large and inexpensive labour force available in areas of low population density. This, in turn, allowed export-oriented, labour-intensive cultivation to develop (Kivelson, 2006). Low labour costs proved essential to marketing primary goods in distant places, and in conquering international markets despite high transport costs (Kula, 1993), whiles the vast amount of land available and the characteristic organization of servile landed estates, made it possible to enlarge hemp cultivation without threatening food crops and endangering the equilibrium of food production (Hellie, 1999). But hemp was much more than just an export-oriented crop, nearly mono-cultural in nature. Serfs lived concentrated in villages on big estates, where, as was usual in the feudal system, they worked partly on the landlord's estate, and partly on village common fields and their own family plots. The latter two types of cultivation were intended for subsistence production, as well as to produce the surplus needed to pay taxes and dues, and buy goods in the market. In this context, domestically produced items

12 Seed hemp production can be taken as a proxy for overall hemp production, as fibres and seeds were normally harvested together.

like yarns, cloth and ropes were consumed in the household, exchanged and sold, significantly increasing, in the latter instance, peasant cash reserves (Khromov, 1950). This aspect became all the more important from the early eighteenth century onwards, when serfs' conditions began to deteriorate. Plots left to the communities were reduced to the minimum, while taxes rose, rents soared, and landlords demanded cash payments, rather than just labour or a share of the crops. Spinning and weaving then became vital to household economic equilibrium, as proved by the fact that fibre harvested in village, and private plots soon exceeded domestic needs, significantly increasing the total hemp available, and making it possible to produce of a whole range of items, from linen to ropes, from sail-cloth to garments, to be sold on the market through various networks (Khromov, 1950). At the lowest level peddlers exchanged a vast array of utensils, tools and garments for hemp items that were then sold in local and regional markets and fairs. At the middle and higher level, merchants collected fibre or yarn to be woven into cloth in local workshops, managed mainly by merchants, but sometimes also by the local nobility.

Home spinning and textile workshops became a distinctive trait of a changing serf economy. By the end of the early modern period there were an estimated 310,000 weavers and more than a million spinners working in the provinces of Western Russia, manufacturing 140,000,000 *arshins*[13] of cloths a year (Kahan, 1986: 78). As a rule workshops employed a limited number of weavers, normally no more than 10 to 12, usually serfs. They used yarn produced by domestic spinners, who were mainly women and children. By the end of the eighteenth century the country could count on 318 shops and 29,303 weavers. Most of this production went to Archangelsk and to the harbours on the Baltic, where it was sold to trading companies and shipped westwards. Hemp, and hemp-related products, counted among the most significant items in the Russian balance of payments by the early eighteenth century; this in turn confirms the importance of the sector for the national economy. Hemp, in other words, contributed greatly to giving the country the currency needed to pay for imports from Europe or its colonies. Thus Russian hemp was exchanged for American tobacco, the two items forming the backbone of early trade relations between Muscovy and the United States (Tables 14.5-14.7; Khromov, 1950; Fredrickson, 1956: 109-125).

The wide availability of hand-spun yarns not only encouraged trade; it also stimulated the creation of Western-styles workshops. Russian Tsar Peter the Great (ruled 1682-1725), in particular, imitated the French *manufactures royales* in an evident attempt to limit the import of medium- and high-quality cloth from Western Europe, and to promote the emergence of a modern textile industry. State textile manufactures, the so-called *Khamovnye Dvory*,

13 The *arshin* is an old unit of measurement of length corresponding to 71.12 centimeters.

in Moscow, Yaroslav and Saint-Petersburg represent the clearest and most effective examples of this policy. By the time Peter died, they had become real factories, occupying more than 1900 weavers, working on 842 looms and producing as much as 1.2 million *arshin* of cloth yearly. Soon private entrepreneurs were lured into this fast-growing market. Ivan M. Zatrapeznov and the Savajacobov family in Yaroslav, for example, bought public workshops, founded new factories and diversified the original business by imitating western products. Immigrants played an important role, especially the Dutch and Germans. The latter contributed actively to developing the sector, investing in plants in and around Moscow and Saint-Petersburg, transferring technology and know-how, spreading European taste and fashion and linking Russian and European markets more closely (Sneghirev 1947). Production included 'Silesian' bleached cloth, hemp cloth for sails, uniforms, and bags, mixed cloth of local flax and hemp, and Persian or Turkish cottons. Production rose all through the eighteenth and nineteenth centuries; it went mainly to the domestic market but was also exported to Europe and North America, where its main competitive advantage was its low price, rather than its quality, as confirmed by Western merchants who insisted continually that Russian spinners, weavers and bleachers could not match Western standards (Kahan, 1986: 78).

In this regard, there was never a negative correlation between hemp production and grain prices: both moved upward until the First World War. As we have seen, a multitude of factors encouraged hemp production even when

Table 14.5. Composition of Russian Exports (% of value), 1710-1795

	1710	**1769**	**1793-1795**
crops	37.8	50.5	43.1
hemp	*34.4*	*18.8*	*20.2*
flax	*3.3*	*11.3*	*12.6*
linseed and hempseed	0.04	3.5	3.4
grains	2.9	16.9	6.9
Livestock products	50.4	12.5	18.1
tallow			
hides			
forest products	5.1	4.5	4.2
industrial goods			
iron		9.8	12
linen textiles	3.3	13	10.2

Source: Kahan, 1986: 168

Table 14.6. Exports of Hemp from Russia in *shippounds* (136 kilograms) Average for each period

Years	Exports from Baltic Ports	Total Exports	Exports from St.-Petersburg
1720-1724	42,354.40		
1724-1729	79,623.00		
1730-1734	68,776.40		
1735-1739	84,674.00		
1740-1744	202,259.20		
1745-1749	117,020.60		
1750-1754	145,659.40		
1755-1759	176,376.20		
1760-1764	134,001.00	188,954.00	
1765-1769	145,463.80	184,732.60	130,096.60
1770-1774	189,111.80	248,818.40	162,905.40
1775-1779	212,174.60		179,916.20
1780-1784	224,607.00		187,216.80
1785-1789	223,880.00		186,992.70
1790-1794	259,300.00		219,821.80
1795-1799			208,837.70

Source: KAHAN, 1986: 177-179.

Table 14.7. Value of exports from Russia to America (in thousands rubles)

Year	Total Russian Exports	Hemp		
		Total	Hemp exports to the US.	Hemp Exports to GB
1827	209,792.00	26,270.00	2,561.00	14,974.00
1828	173,171.00	23,507.00	2,731.00	–
1829	188,274.00	15,873.00	1,236.00	8,980.00
1830	235,369.00	17,463.00	386.00	–
1831	227,265.00	17,688.00	1,333.00	12,633.00
1832	228,298.00	19,419.00	1,327.00	–

Table 14.7 (Continued)

Year	Total Russian Exports	Hemp Total	Hemp exports to the US.	Hemp Exports to GB
1833	218,794.00	19,536.00	2,086.00	11,506.00
1834	199,826.00	18,614.00	919.00	–
1835	–	–	–	–
1836	250,451.00	20,151.00	2,899.00	–
1837	230,340.00	24,304.00	1,023.00	15,701.00
1838	181,111.00	28,794.00	886.00	
1839	313,078.00	32,604.00	969.00	10,408.00
1840	–	–	–	–
1841	74,817.00	7,411.00	412.00	4,141.00
1842	72,262.00	6,388.00	464.00	–
1843	71,209.00	5,548.00	3,362.00	2,857.00
1844	80,514.00	6,730.00	141.00	–
1845	78,802.00	6,322.00	206.00	3,029.00
1846	88,392.00	6,826.00	61.00	–
1847	134,112.00	7,395.00	287.00	4,019.00
1848	75,937.00	6,275.00	148.00	–
1849	83,381.00	7,479.00	275.00	4,097.00
1850	83,133.00	6,555.00	132.00	–
1851	94,073.00	7,325.00	185.00	4,226.00
1852	100,050.00	6,695.00	298.00	–
1853	137,406.00	9,398.00	271.00	6,645.00
1854	53,521.00	–	–	–
1855	–	–	–	–
1856	146,771.00	7,953.00	505.00	–
1857	–	7,871.00	211.00	–
1858	136,487.00	7,692.00	333.00	–
1859	149,395.00	8,964.00	255.00	2,251.00
1860	165,183.00	8,039.00	33.00	–

Source: KIRCHNER, 1975: 144.

Table 14.8. Hemp production in Europe and Russia (1903-1912)

Country	Hectares	Percentage	Quintals	Percentage	Qx/ha
Russia	686,197	72.14	3,440,579	63.03	5.01
Russia As.	66,917	7.03	297,049	5.44	4.44
Total Russia	**753,114**	**79.17**	**3,737,628**	**68.47**	**4.96**
Italy	**79,477**	**8.36**	**795,000**	**14.56**	**10.00**
Hungary	65,192	6.85	587,954	10.77	9.02
France	17,214	1.81	147,266	2.70	8.56
Japan	13,518	1.42	94,893	1.74	7.02
Serbia	14,025	1.47	67,025	1.23	4.78
Romania	5,678	0.60	19,035	0.35	3.35
Bulgaria	3,015	0.32	9,769	0.18	3.24
TOTAL	951,233	100.00	5,458,570	100.00	

Sources: Capasso, 1994: 13 and author's calculations.

Table 14.9. Hemp Seeds Production – 1795 (Governorate – Chetverti and percentage of the total)

Province	Yield (chetvert')	% total	Province	Yield (chetvert')	% total
Vologoda Province	47 000	1,37	Polozk Governorate	51 602	1,50
Voronezh Governorate	82 464	2,40	Pskov Governorate	59 254	1,73
Irkutsk Governorate	33 620	0,98	Revel Governorate	5 400	0,16
Caucasus Governorate	4 054	0,12	Rjasan Governorate	93 366	2,72
Kaluga Governorate	**269 124**	**7,84**	Sankt Petersburg Governorate	16 234	0,47
Kiev Governorate	36 000	1,05	Saratov Governorate	137 648	4,01
Kostrom Governorate	6 852	0,20	**Simbirsk Governorate**	**239 202**	**6,97**
Kursk Governorate	**257 996**	**7,51**	Smolensk Governorate	153 632	4,47
Mogilev Governorate	**246 000**	**7,16**	Tambovsk Governorate	84 810	2,47
Moscow Governorate	101 278	2,95	Tobolsk Governorate	21 904	0,64
Nizhny Novgorod Governorate	**180 270**	**5,25**	Tula Governorate	156 000	4,54

Table 14.9. (Continued)

Province	Yield (chetvert')	% total	Province	Yield (chetvert')	% total
Novhorod-Siverskyi Governorate	75 390	2,20	Ufa province	78 710	2,29
Olonets Governorate	4 860	0,14	Karkhov Governorate	90 000	2,62
Orlov Governorate	**772 810**	**22,51**	Chernikoiv Governorate	31 844	0,93
Pensen Governorate	85 318	2,48	Yaroslav Governorate	10 888	0,32
			total	**3 433 530**	**100,00**

Source: Kessler, 2015: http://ristat.org/ – (1 chetvert' = 209,91 L.)

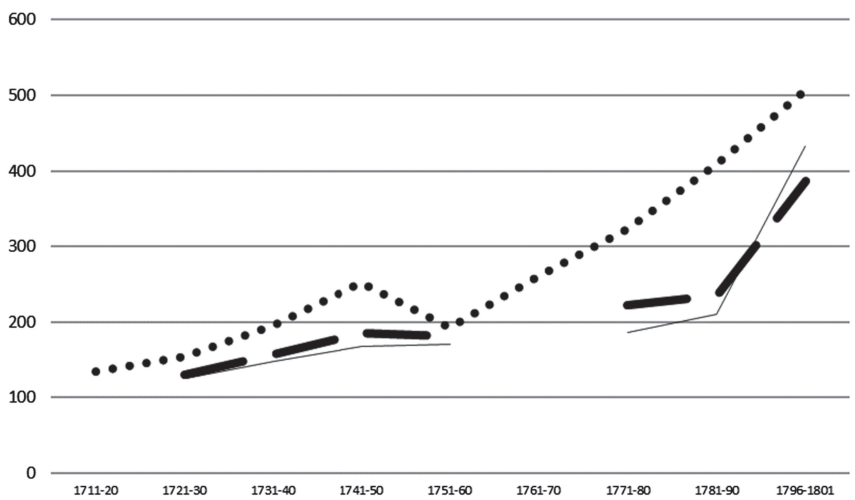

Figure 14.7. Hemp and Flax Prices in Russia, 1711-1801 (index: 1710=100)

Source: Mironov, 1986: 217-251 and author's calculations.
Solid line: hemp; dotted line: hemp seeds; dashed line: flax

prices were falling on international markets, and, once again, its growth was linked more to the place and role of the entire 'hemp sector' in Russia economy and society than to the immediate price differential between alternative crops (Khromov, 1950). Its importance in home consumption and local markets and its role in the equilibrium of village and household finance, contributed to hemp's success as much as its insertion in global trading networks. Late

nineteenth-century Russian hemp growers also profited from external factors, such as their increasing productivity, the disappearance of many competitors from the world market, and, last but not least, the development of a textile industry that saw hemp as a viable alternative to cotton (Kahan, 1989).

V. Conclusions

This article tackles the historical question of whether hemp – a textile fibre that can logically be considered a substitute for wheat – was actually an alternative to cereals in times of major market disruption, along the lines of Joan Thirsk's model of 'alternative agriculture'. This interpretation is tested by analysing the evolution of hemp cultivation in three European regions, where both hemp and wheat were widely cultivated in the early modern and modern periods, to see whether there was any negative relation between grain price trends and the surface area given over to hemp growing (Table 14.10).

Table 14.10. Hemp Growing in the Eastern Po Valley, Généralité of Tours, Western Russia: summary and comparison

	Eastern Po valley	*Généralité of Tours*	*Western Russia*
Historiography	adequate	a few serious studies, some local history	unfrequent studies
Origins	Ancient times; small plots for home consumption up to the 15th century	Ancient times; small plots for home consumption up to the 17th century	Ancient times; small plots for home consumption up to the 15th century
	naval industry; exports to Italian, Spanish and French ports	state initiatives; French naval industry	serf labour; export-oriented produce
Factors of development	production relations within sharecropping	proto-industrial spinning and weaving on tenant and independent farms	proto-industrial spinning and weaving within servile forms of production
	advanced yarn production	cloth manufacturing	cloth manufacturing
Course of development	to early 20th century	to the 1860s	to early 20th century

Table 14.10. (Continued)

	Eastern Po valley	*Généralité of Tours*	*Western Russia*
Grain prices	1820-1870: rising; 1870-1899: falling; 1900-1914: rising	1816-1870: rising	1750-1790: rising; 1820-1870: rising
Factors of crisis	falling hemp prices; more competition from other fibres (early 20th century	falling hemp prices;more competition from other fibres (early 19th century)	falling hemp prices;more competition from other fibres (early 20th century)
Negative correlation with grain prices?	no evidence	no evidence	no evidence

The cases examined here show no evidence of such a link. On the contrary, they emphasize that the choice to grow hemp can be explained only taking into account a vast, and heterogeneous range of factors, including simultaneously local production relationships, the role of the fibre in domestic and international trade and the extent to which it fitted into agriculture, domestic manufacturing, and industry and into home consumption. Which, in turn, emphasizes that although prices were certainly important to producers' decisions, they nevertheless remained only one of the many factors determining the actual production mix.

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Annexes

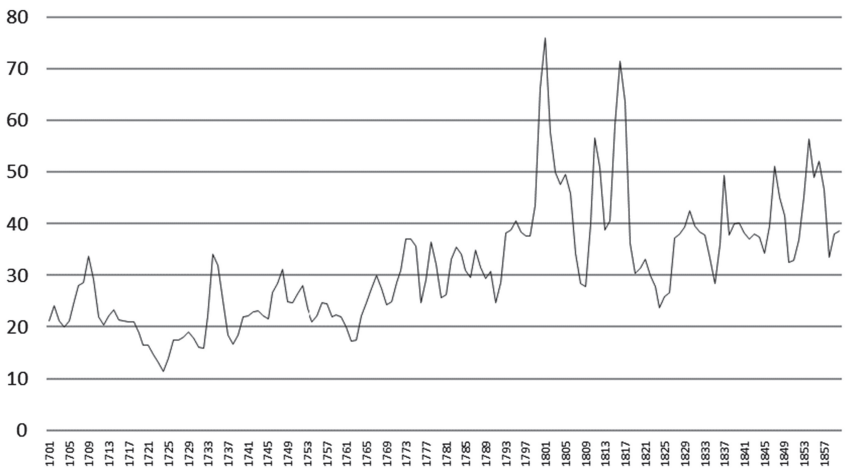

Figure 14.8. Wheat Prices in Milan, 1701-1860 (lire/moggio)

Sources: de Maddalena, 1974, and author's calculations.

Figure 14.9. National Wheat Prices in Italy, 1860-1907 (euros/quintal)

Sources: ISTAT, Serie Storiche, *Prezzi alla produzione dei principali prodotti venduti dagli agricoltori (1861-2010)*, and author's calculations.

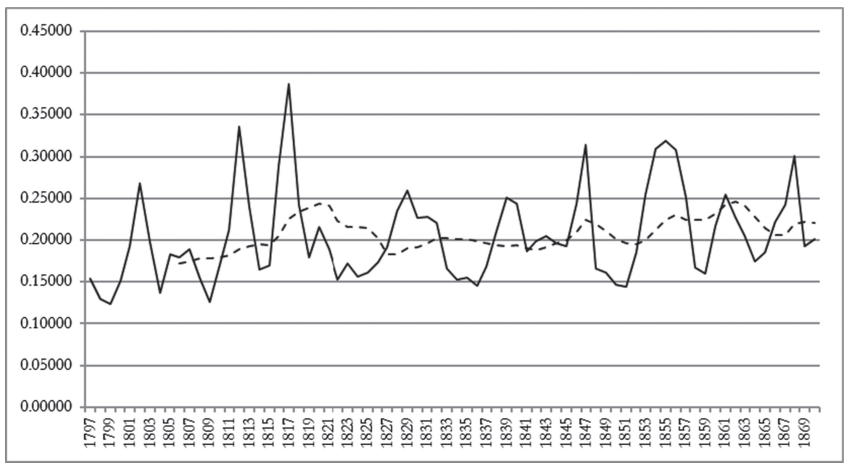

Figure 14.10. Wheat Prices in Paris, 1797-1869 (francs/litre)

Sources: Micheline Baulant, 1968: 520-540; Hoffman, 1996 and author's calculations. Solid line: values; dashed line: 5-year moving average.

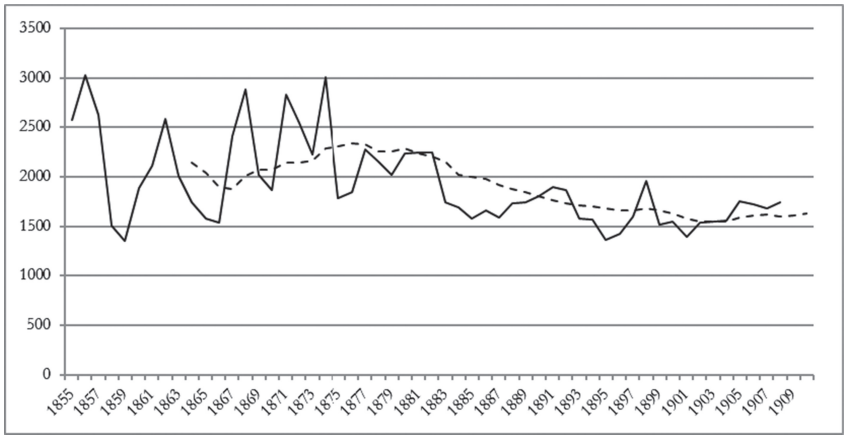

Figure 14.11. Wheat Prices in Lunéville (Meuse), France 1855-1909 (cents/hl)

Source: http://eh.net/database/wheat-prices-in-france-1825-1913/
Solid line: values; dashed line:10-year moving average.

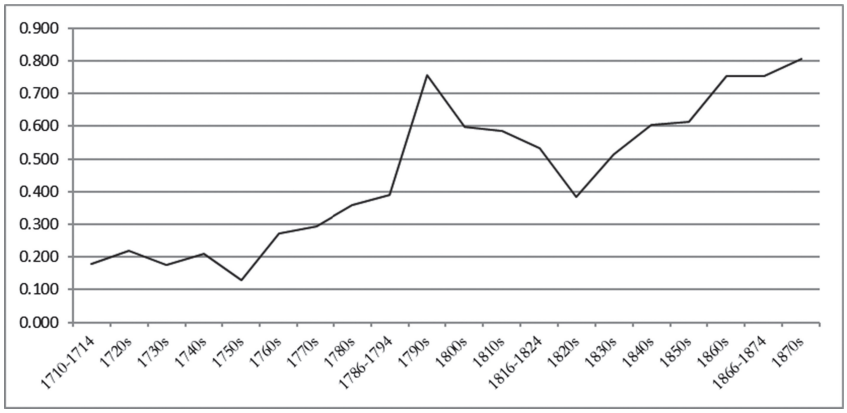

Figure 14.12. Wheat prices in North Dvina, Russia, 1710-1870 (grams of silver/kg)

Source: http://gpih.ucdavis.edu/Datafilelist.htm#Europe

Figure 14.13. Wheat price index, Russia, 1711-1914 (index: 1711= 100)

Source: B. Mironov, 1986: 217-251 and author's calculations