

Encouraging investment in industrial hemp farming as a factor of economic development of Eastern Croatia

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ECONOMY OF EASTERN CROATIA – VISION AND GROWTH

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ENCOURAGING INVESTMENT IN INDUSTRIAL HEMP FARMING AS A FACTOR OF ECONOMIC DEVELOPMENT OF EASTERN CROATIA

ABSTRACT

In the Republic of Croatia, currently about 857 hectares of land have been planted with industrial hemp and 69 planting permits were issued. The cultivation of industrial hemp in the Republic of Croatia is regulated by the Ordinance on the conditions for hemp growing, the method of poppy farming, the conditions for the possession and circulation of narcotics in veterinary medicine and the Law of narcotics abusers. With Croatia joining the EU, Croatia has accepted a sort base from the EU but has not regulated the processing of industrial hemp. In Croatia, therefore, hemp can only be used for the production of seed for human and animal food. Stem cells need to stagnate, which is not the practice in other EU countries. In 2012, the Ministry of Agriculture made changes to the Ordinance on conditions for hemp cultivation, the method of poppy breeding and the conditions for possession of narcotics in the veterinary sector, thus creating the opportunity to return industrial hemp to our areas. The aim of the paper is to evaluate the profitability of investments in industrial hemp farming and to point to the various investment opportunities offered by this "queen of plants". The paper will also discuss the possibility and necessity of amending the Act or the Ordinance regulating the cultivation of hemp in the Republic of Croatia. The work is structured in a way that encompasses a comprehensive investment analysis and an assessment of the investment efficiency in industrial hemp by applying dynamic methods of assessing the efficiency of the investment - net present value, the internal rate of profitability, the period of return, the index of profitability etc. The results of this analysis should enable conclusions of investment efficiency.

Key words: *Industrial hemp, Dynamic investment analysis, Net present value, Internal rate of return, Period of return*

1. Introduction

It is said that industrial hemp is the oldest and most healthy plant in the world. It can also be said that industrial hemp follows the development of human civilization, since it is believed that people used it 5000 years ago. The biggest problem that follows this plant is stigmatization and its physical similarity to Indian hemp, which is used as a drug, so unfortunately its farming in many countries is illegal or legally limited. For example, industrial hemp in the Republic of Croatia can only be used for the purpose of producing food for humans and animals, so only seeds and flowers may be used, while the remaining part must be destroyed. The very idea of this final paper is based on the assumption that it is worth investing in industrial hemp. Financial viability will be shown by financial analysis of investment in industrial hemp cultivation. The data in the paper are based on author's own research of available scientific and professional literature, and on the example of economic-financial investment analysis. All the calculations and tables presented in this paper are based on author's own research. The most commonly used method is the secondary method, i.e. the compilation method, acquisition of quotations of other authors, i.e. their observations, attitudes and knowledge, and the appropriate statistical and mathematical methods applied in the presentation of the results of this research paper. The basic starting point of the paper is to present a project proposal based on the industrial hemp farming, i.e. investment in farming and planting. It is well known that agriculture in the Republic of Croatia is based on traditional crops, wheat and maize, especially in the region of Slavonia and Baranja, which is currently lagging behind the average macroeconomic indicators for the Republic of Croatia (more in Štavlić, 2018). Existing developmental disparities are one of the reasons for encouraging investment in industrial hemp farming as a potential factor for the development of eastern Croatia. The aim of this paper is to show the financial viability of investments in industrial hemp farming using dynamic project efficiency analysis. The described project can be carried out in the Republic of Croatia if there is a change in the existing legislation on industrial hemp farming.

2. Legislation on hemp farming in the Republic of Croatia and in surrounding countries

In the Republic of Croatia, production and planting of industrial hemp is regulated by the Ordinance on conditions for the cultivation of hemp, method for applying for poppy farming and the conditions for the possession of narcotic drugs in veterinary medicine, hereinafter referred to as "Official Gazette No 18/2012" and the Suppression of Narcotic Drug Abuse Act, hereinafter referred to as Official Gazette 107/2012. The aforementioned Ordinance defines who can farm and plant industrial hemp. At the end of 2018, the Ministry of Agriculture announced on its official website that the Draft Act on Amendments to the Suppression of Narcotic Drug Abuse Act will soon be on the agenda of the Croatian Parliament. Thus, the following is stated: "restriction that hemp may only be used for the purpose of food and feed production, has placed domestic agricultural producers in an unfavourable position with respect to producers in the European Union. The current legal regulation prohibiting the use of the entire plant of industrial hemp is a limiting factor and makes it impossible for our farmers to realize the investments and to further develop their farms." (Tolušić, 2018, url) It is suggested that industrial hemp be defined as "industrial hemp listed in the EU Commonwealth List with a THC content of 0.2% and below and is not included in the list of plants from which drugs can be obtained, and foresees the abolition of the obligation to submit a request for farming and the issuance of a decision on hemp farming license. Farmers will have to be entered in the register without the additional requirement of criminal records." (Tolušić, 2018, url) The new legislative proposal will allow stem processing. This opens a wider spectrum of use.

Table 1 below presents a brief overview of the comparison of the above mentioned three legislation, legislation in force in the Republic of Croatia, Serbia and Slovenia.

Table 1: Difference between the Ordinance on industrial hemp farming in Croatia, Serbia and Slovenia

State	Croatia	Serbia	Slovenia
Purpose of farming	Production of food and feed	Production of food and feed, production of fibres and production of seeds for further reproduction	Production of seeds for further reproduction, for the production of food and beverages, for the production of cosmetic preparations, for the production of fibres and other industrial purposes
Deadline for submission of applications	May 31 st of the current year	April 30 th of the current year	from March 15 th to August 31 st
The amount of THC in dry matter	0.2%	0.3%	0.2%

Source: author's research, according to OG no. 18/2012; OG 107/2012; RS No. 64/13; RS No. 99/10; RS No. 40/11; RS No. 36/15 and RS No. 33/18

From the table above, we can see the differences in the purpose of production. While industrial hemp in Croatia can only be used for production of food and feed, in Serbia it can be used for fibre and seed production for further reproduction. While the application in Slovenia is far larger than in Croatia and Serbia, in Slovenia industrial hemp can be used for seed production for further production, food and beverage production, cosmetics production, fibre production and other industrial purposes. Compared to Serbia, in Slovenia industrial hemp can be used for producing beverages, cosmetics and other industrial purposes. All three countries have different deadlines for applying for sowing, and regarding the THC content, Croatia and Slovenia have a rate of 0.2% while Serbia has a rate of 0.3%. In Croatia, the production is limited to several products, while the potential for production and use of industrial hemp is far greater than that.

3. Industrial hemp farming in the Republic of Croatia

Authors Obranović and Ozmec (2014: 14) and (Anonymous, 2014, url) state that industrial hemp has, alongside flax, been the main industrial plant in Croatia for centuries. The first hemp and lax weaving mills were opened in Ozalj in 1728. They also mention that there were hemp weaving mills in Osijek, Črnkovci and Viškovci near Đakovo. Thus, it is well known that industrial hemp in Croatia has been cultivated for nearly 291 years. From 1992 until 2012, hemp farming was prohibited, and in 2012 the Ordinance regulating the farming and use of industrial hemp was passed. Legal regulations are explained in more detail in the previous chapter. Table 2 below shows the surface area in hectares of industrial hemp and the number of planting applications issued by the Ministry of Agriculture of the Republic of Croatia in 2016, 2017 and 2018. From the data shown, there are visible oscillations occurring between the number of hectares planted and the number of issued permits per county over the past three years. In 2016, the most hectares were planted, while the maximum number of licenses was issued in 2017. Over the past three years, the number of hectares of industrial hemp has been reduced, and it is particularly interesting in 2017, where a significant increase in the number of permits has been recorded, but with a large reduction in the surface area. The average surface area per license

issued in 2016 was 12.42 hectares, in 2017 it was 2.76 hectares per license, and in 2018 it was 11.82 hectares per license.

Table 2: Area of hectares planted and number of licenses issued by counties

Year	2016		2017		2018	
County	Number of licenses	Number of hectares	Number of licenses	Number of hectares	Number of licenses	Number of hectares
Bjelovar-Bilogora	7	22.96	6	10:18	4	12.76
Brod-Posavina	3	17,20	0	0	0	0
Dubrovnik-Neretva	0	0	0	0	0	0
Istria	13	144.21	13	7.31	4	9.78
Karlovac	4	8.27	7	5.81	2	2.30
Koprivnica-Krizevci	4	7.90	7	7.31	3	26.07
Krapina-Zagorje	6	39.32	5	2.71	0	0
Istria	0	0	0	0	0	0
Međimurje	4	24.46	18	7.74	3	3.93
Osijek-Baranja	17	182.95	41	143.77	9	51.18
Požega-Slavonia	2	7.70	1	3.73	0	0
Primorje-Gorski Kotar	1	20,29	0	0	0	0
Sisak-Moslavina	18	404.68	75	309.70	11	378.60
Split-Dalmatia	1	5.10	4	3.95	1	4.21
Varaždin	6	17.52	21	14.89	4	23.85
Virovitica-Podravina	18	348.80	56	187.83	14	303.42
Vukovar-Srijem	15	222.19	10	27,04	6	19,79
Zadar	0	0	5	1.47	0	0
Zagreb	8	183.16	19	60.23	5	12.78
Šibenik-Knin	0	0	0	0	0	0
City of Zagreb	7	9.88	29	88.47	3	8.60
Total	132	1,560.25	320	882.14	69	857.27

Source: by the author, according to: <https://www.apprrr.hr/agronet/>

Table 3: Calculation of base indices and rates of change according to sowed hectares in 2016, 2017 and 2018 in Croatian counties

Year	2016 = Yt	Yb = 2017, 2016 = 100			Yc = 2018, 2016 = 100		
	Surface in ha	Surface in ha	It 1	St1	Surface in ha	It 2	St 2
County							
Bjelovar-Bilogora	22.96	10:18	44.34	-55.66	12.76	55.57	-45.43
Brod-Posavina	17,20	0	-	-	0	-	-
Dubrovnik-Neretva	0	0	-	-	0	-	-
Istria	144.21	7.31	5.25	-94.75	9.78	2.7	93.98
Karlovac	8.27	5.81	70.25	-29.75	2.30	27.81	-72.19
Koprivnica-Krizevci	7.90	7.31	92.53	-7.47	26.07	330.00	230.00
Krapina-Zagorje	39.32	2.71	6.89	-68.36	0	-	-
Istria	0	0	-	-	0	-	-
Međimurje	24.46	7.74	31.64	-68.36	3.93	16:07	-83.93
Osijek-Baranja	182.95	143.77	78.58	-21.42	51.18	27.97	-72.03
Požega-Slavonia	7.70	3.73	48.44	-51.56	0	-	-
Primorje-Gorski Kotar	20,29	0	-	-	0	-	-
Sisak-Moslavina	404.68	309.70	76.53	-23.47	378.60	93.56	-6.44
Split-Dalmatia	5.10	3.95	77.45	-22.15	4.21	82.55	-17.45
Varaždin	17.52	14.89	84.99	-15.01	23.85	136.13	36.13
Virovitica-Podravina	348.80	187.83	53.85	-46.15	303.42	86.99	-13.01
Vukovar-Srijem	222.19	27,04	12:13	-87.87	19,79	8.88	-91.12
Zadar	0	1.47	-	-	0	-	-
Zagreb	183.16	60.23	74.28	-25.72	12.78	15.76	-84.24
Šibenik-Knin	0	0	-	-	0	-	-
City of Zagreb	9.88	88.47	895.45	795.45	8.60	87.04	-12.96
Total	1,560.25	882.14	56.54	-43.46	857.27	54.94	-45.06

Source: calculation by the author

According to data from Table 3, the total area on which industrial hemp is planted is reducing every year. No county in Croatia has recorded continuous growth, and that the area of planted hectares is growing every year. According to the data presented, it can be seen that the total farming area on which industrial hemp was planted in 2017 decreased by 43.46% compared to the area planted in the base 2016. The year 2016 was taken as the base year because in that year hemp was planted on the largest surface area. In addition, taking into account 2018, it is apparent that the surface area on which industrial hemp was planted decreased by 45.06% compared to 2016. The above data may indicate that farmers are abandoning planting industrial hemp for various reasons, which may be the subject of some future research.

4. Economic - financial analysis of investment profitability in industrial hemp

According to Cingula, Hunjak and Redep (2004: 80), every business process should also be considered as a possibility of returning funds in some accounting period. The ability to repay the invested funds can be considered after a business plan is made, with an emphasis on the financial plan and the financial performance of a project or investment based on the projection of the profit and loss and cash flow.

Below is an analysis of the financial viability of investing in farming and processing industrial hemp for producing seeds, thermal insulation boards and bio-plastics. This processing and production is possible with the amendment of the existing legal framework regulating farming and processing of industrial hemp in the Republic of Croatia.

From the point of view of the project, profitability analysis should always begin with the presentation of long-term and short-term material and immaterial assets. I.e., with presenting what we need to get started with the project. The projection of required investments is shown in the following table.

Table 4: Projected project investments

No.	Project investment structure	Total investment	%
1	Fixed assets	2,120,000.00	78.42
1.1	Founding investment	00:00	0
1.2	Land and buildings	1,550,000.00	57.34
1.3	Equipment	570,000.00	21.09
1.4	Research and development	0.00	0
2	Working assets	583.333.33	21.58
Total investment in the project		2.703.333.33	100

Source: by the author, authors to the Business Plan Creation Tool <https://app.budiuzor.tera.hr/>

The above table shows that HRK 2,120,000.00 is amount of fixed assets, i.e. long-term assets. The value of land and buildings accounts for 57.34% of the total investment, while the fixed assets account for 78.42%. Working assets amounted to HRK 588,333.33, which amounts to 21.58% of total investments.

Table 5: Sources of funding

No.	Sources of funding	Amount	%
1	Fixed assets owned by others	1.003.333.33	37.11
2	Other sources of funding	0.00	0.00
3	Own sources of funds	1,700,000.00	62.89
IN TOTAL		2.703.333.33	100.00

Source: by the author, authors to the Business Plan Creation Tool <https://app.budiuzor.tera.hr/>

The data in Table 5 show that 37.11% of the total investment in the project is capital owned by others, i.e. that 37.11% of the project value is financed from long-term loans.

Table 6. Calculation of credits

Repayment year	Quarter	Amount of debt	Amount of interest	Payment	Annuity	Annual interest	Annual annuity
1	1	1,003,333.33	12541.67	44,468.12	57009.79	46,803.68	228,039.16
	2	958,865.21	11,985.82	45,023.98	57,009.79		
	3	913,841.23	11,423.02	45,586.78	57,009.79		
	4	868,254.45	10,853.18	46,156.61	57,009.79		
2	1	822,097.84	10,276.22	46,733.57	57,009.79	37,570.57	228,039.16
	2	775,364.27	9,692.05	47,317.74	57,009.79		
	3	728,046.54	9,100.58	47,909.21	57,009.79		
	4	680,137.33	8,501.72	48,508.07	57,009.79		
3	1	631,629.25	7,895.37	49,114.42	57,009.79	27,867.09	228,039.16
	2	582,514.82	7,281.44	49,728.36	57,009.79		
	3	532,786.47	6,659.83	50,349.96	57,009.79		
	4	482,436.51	6,030.46	50,979.33	57,009.79		
4	1	431,457.18	5,393.21	51,616.58	57,009.79	17,669.25	228,039.16
	2	379,840.60	4,748.01	52,261.78	57,009.79		
	3	327,578.82	4,094.74	52,915.06	57,009.79		
	4	274,663.77	3,433.30	53,576.49	57,009.79		
5	1	221,087.27	2,763.59	54,246.20	57,009.79	6,951.89	228,039.16
	2	166,841.07	2,085.51	54,924.28	57,009.79		
	3	111,916.79	1,398.96	55,610.83	57,009.79		
	4	56,305.96	703.82	56,305.97	57,009.79		
TOTAL			136,862.48	1,003,333.33	1,140,195.81	136,862.48	1,140,195.81

Source: by the author, authors to the Business Plan Creation Tool <https://app.budiuzor.tera.hr/>

Table 6 shows the calculations of loans with equal annuities. The above table shows the calculation of loans by equal annuities. The loan amount is HRK 1,003,333.33. The loan is valid for five years with an interest rate of 5%. The total value of interest rates represents the total cost of the loan, which amounts to HRK 136,862.48.

The following three tables present the operating costs for the next five years of the project. The tables include material costs, service costs, and costs that do not fall under one of the categories mentioned since they are neither material costs nor service costs.

Table 7: Material costs

Name	Year 1	Year 2	Year 3	Year 4	Year 5
Energy Costs	165,000.00	165,000.00	165,000.00	165,000.00	165,000.00
Transportation costs	60,000.00	60,000.00	60,000.00	60,000.00	60,000.00
Fuel costs	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00
Raw materials	5,394,917.00	5,394,917.00	5,394,917.00	5,394,917.00	5,394,917.00
Cost of materials	100,000.00	100,000.00	100,000.00	100,000.00	100,000.00
Seed procurement costs	8,250.00	8,250.00	8,250.00	8,250.00	8,250.00

Source: by the author, authors to the Business Plan Creation Tool <https://app.budiuzor.tera.hr/>

Table 8 shows material costs in projection in five years of business. The table included costs of energy, transportation, fuel, raw materials, materials, procurement.

Table 8: Service Costs

Name	Year 1	Year 2	Year 3	Year 4	Year 5
Marketing Costs	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00
Bookkeeping costs	24,000.00	24,000.00	24,000.00	24,000.00	24,000.00
Service Costs	65,000.00	65,000.00	65,000.00	65,000.00	65,000.00
Utility costs	35,000.00	35,000.00	35,000.00	35,000.00	35,000.00
Maintenance costs	100,000.00	100,000.00	100,000.00	100,000.00	100,000.00
Harvest costs	20,000.00	20,000.00	20,000.00	20,000.00	20,000.00
Insurance costs	8,870.00	8,870.00	8,870.00	8,870.00	8,870.00

Source: by the author, authors to the Business Plan Creation Tool <https://app.budiuzor.tera.hr/>

Table 8 shows the cost of services. The table included costs of marketing, bookkeeping, services, utilities, maintenance, harvest and insurance.

Table 9: Other costs

Name	Year 1	Year 2	Year 3	Year 4	Year 5
Educations	75,000.00	75,000.00	75,000.00	75,000.00	75,000.00
Professional literature	25,000.00	25,000.00	25,000.00	25,000.00	25,000.00
Extraordinary expenses	30,000.00	30,000.00	30,000.00	30,000.00	30,000.00
Socially responsible business conduct	50,000.00	50,000.00	50,000.00	50,000.00	50,000.00

Source: by the author, authors to the Business Plan Creation Tool <https://app.budiuzor.tera.hr/>

Table 9 shows the costs of professional literature, extraordinary expenses, education, and costs for socially responsible business conduct.

Table 10: Name and unit price of planned products

Name	Service	Year 1	Year 2	Year 3	Year 4	Year 5
Seed	Not	15.00	15.00	15.00	15.00	15.00
Thermal Insulation Board 100 x 1200 x 600 mm	Not	70.00	70.00	70.00	70.00	70.00
Thermal insulation boards 200 x 800 x 625 mm	Not	280.00	280.00	280.00	280.00	280.00
Bio-plastics	Not	70.00	70.00	70.00	70.00	70.00

Source: by the author, authors to the Business Plan Creation Tool <https://app.budiuzor.tera.hr/>

The table above shows products with their unit prices expressed in HRK. It should be emphasized that seeds and bio-plastics are sold per kilogram, and insulation boards are sold per piece.

Table 11: Planned sales volume

Name	Year 1	Year 2	Year 3	Year 4	Year 5
Seed	7,500	7,530	7,575	7,613	7,651
Thermal insulation boards 100 x 1200 x 600 mm	10,417	10,469	10,512	10,574	10,627
Thermal insulation boards 200 x 800 x 625 mm	4,167	4,188	4,208	4,229	4,251
Bio-plastics	416,667	418,750	420,844	422,948	425,063

Source: by the author, authors to the Business Plan Creation Tool <https://app.budiuzor.tera.hr/>

The table below shows sales volumes for a five-year projection. Every year, sales are expected to increase, as shown in Table 11.

Table 12 shows the revenue projection. These amounts have been obtained by multiplying prices listed in Table 10 and planned sales volumes from Table 1, thus calculating projections of revenue for each year.

Table 12: Revenue projection

Product name	Year 1	Year 2	Year 3	Year 4	Year 5
Seed	112,500.00	113,070.00	113,625.00	114,195.00	114,765.00
Thermal Insulation Boards 100 x 1200 x 600 mm	729,190.00	732,830.00	736,470.00	740,180.00	743,890.00
Thermal insulation boards 200 x 800 x 625 mm	1,166,760.00	1,172,640.00	1,178,240.00	1,184,120.00	1,190,280.00
Bio-plastics	6,250,005.00	6,281,250.00	6,312,660.00	6,344,220.00	6,375,945.00
Total revenue from products	8,258,455.00	8,299,790.00	8,340,995.00	8,382,715.00	8,424,880.00
Total revenue from services	0.00	0.00	0.00	0.00	0.00
Overall revenues	8,258,455.00	8,299,790.00	8,340,995.00	8,382,715.00	8,424,880.00

Source: by the author, authors to the Business Plan Creation Tool <https://app.budiuzor.tera.hr/>

The table below shows a projection of revenue for five years. It is also apparent that revenues are increasing every year, and the cause for that is evident in Table 11, as the sales volume has risen each year, so do the revenues.

The above-mentioned project requires three highly skilled employees; the monthly salary cost for each will amount to HRK 8,000.00 gross. The labour costs of employees who will work as flower pickers and stalkers during harvesting season, based on seasonal employment contracts, which is usually in August and September. The gross salary will amount to HRK 3,000 per employee per month, and the project will require 10 employees to be employed for three months every year.

Table 13: Depreciation costs

Name	Type of property	Value	Durability (years)	Amortization (%)
Tractor Sonalika DI 75 4WD P / S	Material property	98.000,00	10	10,00
Olt pneumatic sowing machine	Material property	30,000.00	10	10,00
Plough Rabewerk	Material property	14,000.00	10	10,00
24 Disk Harrow Olt	Material property	4,000.00	10	10,00
Harrow Eberhard	Material property	4,000.00	10	10,00
Buildings	Material property	1,500,000.00	20	5.00
Plastic processing plant	Material property	200,000.00	10	10,00
Hemp chopper	Material property	20,000.00	10	10,00
Other equipment	Material property	200,000.00	5	20,00

Source: by the author, authors to the Business Plan Creation Tool <https://app.budiuzor.tera.hr/>

This table shows the type of asset amortized, its value and the depreciation percentage amortized each year. It is calculated by deducting a percentage of the total asset value. Specifically for buildings, the value is HRK 1,500,000.00, therefore 10% of the total value amounts to HRK 150,000.00. In the income statement, depreciation will be calculated in this way.

Table 14: Income statement

Items	Amount per project year				
	Year 1	Year 2	Year 3	Year 4	Year 5
Total income	8,258,455.00	8,299,790.00	8,340,995.00	8,382,715.00	8,424,880.00
Product Income	8,258,455.00	8,299,790.00	8,340,995.00	8,382,715.00	8,424,880.00
Service Revenue	0.00	0.00	0.00	0.00	0.00
Total expenditures	6,649,037.00	6,649,037.00	6,649,037.00	6,649,037.00	6,649,037.00
Material costs	5,738,167.00	5,738,167.00	5,738,167.00	5,738,167.00	5,738,167.00
Service Costs	302,870.00	302,870.00	302,870.00	302,870.00	302,870.00
Other business expenses	200,000.00	200,000.00	200,000.00	200,000.00	200,000.00
Cost of permanent workers	288,000.00	288,000.00	288,000.00	288,000.00	288,000.00
Cost of seasonal workers	120,000.00	120,000.00	120,000.00	120,000.00	120,000.00
Operating Profit before depreciation (EBITDA)	1,609,418.00	1,650,753.00	1,691,958.00	1,733,678.00	1,775,843.00
Amortization	152,000.00	152,000.00	152,000.00	152,000.00	152,000.00
Operating Profit (EBIT)	1,457,418.00	1,498,753.00	1,539,958.00	1,581,678.00	1,623,843.00
Financial expense - interest	46,803.68	37,570.57	27,867.09	17,669.25	6,951.89
Profit / Loss Before Taxation	1,410,614.00	1,461,182.00	1,512,091.00	1,564,009.00	1,616,891.00
Income tax 18%	253,911.00	263,012.76	272,176.38	281,521.62	294,040.38
Profit / loss after taxation	1,156,703.00	1,198,169.24	1,239,914.62	1,282,487.38	1,322,850.62

Source: by the author, authors to the Business Plan Creation Tool <https://app.budiuzor.tera.hr/>

Table 14 presents income statement. Operating profit i.e. earnings before interest, taxes and depreciation are calculated by deducting income from expense. It was already explained how amortization is calculated. Operating profit after depreciation is calculated by deducting amortization from EBITA. This gives the operating profit from which the annual interest from Table 9 is deducted. This gives us a pre-tax gain to which 18% profit tax is applied, when the value of the tax on pre-tax profit is deducted, income statement after taxation is obtained.

Table 15: Project's economic flow

Number	Items of receipts and expenditures, net receipts and their cumulative	The observed years of the project (activation and exploitation)						Total
		0.	1.	2.	3.	4.	5.	
I.	Total receipts	0	8,258,455	8,299,790	8,340,995	8,382,715	9,734,880	43,016,835
1.	Total income		8,258,455	8,299,790	8,340,995	8,382,715	8,424,880	41,706,835
2.	Remaining value of fixed assets							0
3.	Remaining value of working capital						1,310,000.00	1,310,000
II.	Total expenditures	2,690,000	6,704,144	6,722,479	6,741,346	6,760,889	6,781,125	36,399,984
4.	Investment in fixed assets	2,120,000						2,120,000
5.	Investments in permanent working assets	570,000						570,000
6.	Expenditures without interest and depreciation		6,450,233	6,459,466	6,469,170	6,479,368	6,490,085	32,348,323
7.	Income tax		253,911	263,013	272,176	281,522	291,040	1,361,662
III.	Net receipts / expenses (I - II)	2,690,000	1,554,311	1,577,311	1,599,649	1,621,826	2,953,755	6,616,851
IV.	Cumulative Net Payments / Expenditures	2,690,000	-1,135,689	441,622	2,041,271	3,663,096	6,616,851	

Source: by the author

Net economic flow shows how real economic value is generated through the project in certain periods. Due to taking into the budget of initial investment, but not the sources of funds for these investments, the value of the economic flow will be negative in the beginning. The moment when the cumulative of net receivables of economic flow becomes positive is the point of return on invested funds from which the repayment period can be read directly. Only then can the project really create a new economic value.

Table 16: Results of the dynamic analysis of the project

DYNAMIC ANALYSIS INDICATOR	YEAR				
	1	2	3	4	5
Period of return on investment	1.74				
Yield rate	43.00%	44.54%	46.09%	47.68%	49.29%
Discounted return period for return on investment	1.87				
Net present value	4,367,466.73				
Internal profitability rate	55.24%				
Profitability index	1.62				
Average profitability of the project	49.20				

Source: by the author

From the previous table it is apparent that the project is efficient and thus cost-effective for investment. The return period of the investment is 1.74 years, which represents a very rapid return of the invested funds to the project. The yields are very high and show a steady growth year after year. The net present value of the project must be positive for the project to be profitable. In this project, the current present value is as high as HRK 4,367,466.73, which is more than satisfactory. The internal rate of profitability is higher than the discount rate, which is estimated at 9% and amounts to 55.24%. Profitability index is greater than 1, and given this criterion the project is financially viable for investment, the average profitability of the project is high 49.20%. Given all indicators of dynamic analysis, this project is efficient and financially viable for investment.

An additional criterion for project efficiency analysis is sensitivity analysis. The sensitivity analysis examines what would happen if there were some imbalances in the market that could affect a business plan in the context of revenue cuts or increase of expenditures. The following table will show a specific example of this investment project as sensitivity analysis is performed.

Table 17: Sensitivity analysis

		Amount per years of project				
		1	2	3	4	5
A	Revenue -10%	7,432,609.50	7,469,811.00	7,506,895.50	7,544,443.50	7,582,392.00
B	Expenses + 10%	7,313,940.70	7,313,940.70	7,313,940.70	7,313,940.70	7,313,940.70
C	Gain (modified)	118,668.80	155,870.30	192,954.80	230,502.80	268,451.30

Source: by the author

According to sensitivity analysis, it can be seen that if revenue decreases 10% and expenditures increase by 10%, the project would remain profitable and financially profitable.

5. Conclusion

Based on the conducted research for the purpose of this paper, it can be concluded that the current state of industrial hemp farming in the Republic of Croatia is far from ideal. Changing legal regulations is crucial for further development of this culture in the Republic of Croatia and a kind of industry based on the production of biodegradable and environmentally acceptable products. Serbia and Slovenia have far better conditions for industrial hemp farming than Croatia, and better and more transparent legislation. Throughout the data presented in this paper, there have been fluctuations in hemp farming for the last three years on the territory of the Republic of Croatia, especially the trend of decreasing farmed surface area. This is apparent from the base index values on how much production in 2017 and 2018 has decreased compared to the 2016 (base year). Thus, it is noticeable that production dropped by 43.46% in 2017, while in 2018 it declined by 45.06%. Through economic-financial analysis and cost-effectiveness analysis, it is apparent that the investment project presented is profitable. All dynamic analysis parameters indicate that it is profitable to invest in an industrial hemp. Again, everything is dependent on current legal regulations in the Republic of Croatia, which prohibits the use of hemp stems. This analysis has proved it is worth investing in stem processing. All these calculations represent a sizeable paradox because they prove how much money industrial hemp farmers in the Republic of Croatia lose. With this legislation, they cannot be competitive on the EU market, and without the change of the legislation governing industrial hemp farming in the

Republic of Croatia larger investments for cultivating and processing this culture cannot be expected, hence the greater economic development of eastern Croatia cannot be expected.

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