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**CROATIAN DEVELOPMENT INDEX AND REGIONAL  
DISPARITIES IN SPATIAL DISTRIBUTION OF EU FUNDS FOR  
RURAL DEVELOPMENT**

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*Preliminary communication*

**Abstract**

*The EU funds are an important factor in the development process of any new member state of the European Union. As such, EU funds support modernization and help facilitate further economic development in a member state, including its rural regions. The Republic of Croatia, based on NUTS3 classification, is predominantly rural with 79.01% of its territory being rural and 56.07% of population living in rural areas. Therefore, rural development is an integral part of overall economic development of the country. In order to improve competitiveness of Croatian agriculture sector, especially its small family farms, it is crucial to invest in their means of production and modernization of their assets. Funds awarded within the EAFRD framework in The Republic of Croatia tend to facilitate this process and further aid rural development. Croatian Development Index has a very important role in allocation of before mentioned funds. Its values are taken as criteria for state-aided areas, scoring projects (including EAFRD and other EU funds applications) and other aspects of public development policies. As one of the primary goals of Rural Development Programme in the Republic of Croatia, it is especially important to achieve a more balanced territorial development of rural areas given the fact that Croatian rural regions (counties and municipalities) are not equally developed, ensuring job creation and job retention in the process. The existence of disparities in the level of development is not a characteristic that can be found only in the Republic of Croatia, but it is an issue that should be taken into*

*account when devising or reconsidering criteria for allocation of future EU funds in the Republic of Croatia, in order to further reduce regional disparities in the level of development. The aim of this paper is to provide empirical evidence on associations between the indicators of Croatian Development Index and spatial distribution of EU funds awarded within the Rural Development programme in The Republic of Croatia based on available data for the most recent invitation to tender for EAFRD funds.*

**Keywords:** *Croatian Development Index, EU, funds, EAFRD, rural development*

**JEL:** F15, O13, Q18

## 1. INTRODUCTION

Rural areas in the Republic of Croatia are facing serious challenges at this moment. Most of these challenges are coming from globalization trends, demographic changes and migration from rural areas of young people (mostly to bigger cities in The Republic of Croatia and other EU countries for job opportunities) thus bearing a consequence of possible depopulation of rural areas and an overall socio-economic decline in those areas. Implementing rural policies is intended to prevent or decrease further decline of rural areas and promote and aid subsequent development of those areas as a vital part of improving overall economic development of any country. These rural policies intend to aim to contribute to recognizing and making use of particular strengths and opportunities of these rural areas, which is not irrelevant, given that rural regions cover 44% of the EU territory, intermediate regions another 44%, while urban regions only represent 12% of the territory (DG Agriculture and Rural Development: Unit Farm Economics, 2018).

## 2. RURAL DEVELOPMENT POLICY IN THE EU AND THE REPUBLIC OF CROATIA

The definition of rural development changed over time, and can be now considered as (Anríquez & Stamoulis, 2007): “development that benefits rural populations; where development is understood as the sustained improvement of the population’s standards of living or welfare.” However, rural development should be further analyzed and explained, as rural development first predominantly focused on agriculture and today the importance of agriculture in rural development is less prominent (Anríquez & Stamoulis, 2007), as rural development can be attributed to tourism activities as well. As such, rural development makes a very important part of the CAP (Common Agricultural Policy) in the EU. Rural Development policy is referred to as the ‘second pillar’ of the EU’s Common Agricultural Policy (CAP),

complementing the system of direct payments to farmers and measures to manage agricultural markets ('first pillar') (enrd.ec.europa.eu, 2018).

After the 2003 Reform of the CAP (which decoupled direct payments from production and introduced single farm payments), EU decided to reform rural development policy in 2005 and from 2007 onwards, a new policy is administered. Today's EU rural policy has many measures that can comply with four main axes (FAO/WB, 2011): improving the competitiveness of agricultural and forestry sector, improving the countryside and the environment, improving the quality of life in rural areas and diversifying the rural economy and LEADER. The EARDF is, along with the EAGF (European Agricultural Guarantee Fund), one of the two financial instruments of the Common Agricultural Policy (CAP) established by Regulation (EC) No 1290/2005. From 1 January 2007, these two funds replace the EAGGF Guidance section and the EAGGF Guarantee section respectively (eur-lex.europa.eu, 2018). The EAFRD (European Agricultural Fund for Rural Development) is a key tool for implementing EU rural development policy. The Fund complements national, regional and local actions, which contribute to Community priorities. The Commission and the Member States are also to ensure that the Fund is consistent and compatible with other Community support measures (eur-lex.europa.eu, 2018). The EAFRD has a total budget of over €99 billion for the period 2014-2020. This support is provided to agriculture, forestry and environment or natural resources management as well as to the sustainable development of rural economy (cohesiondata.ec.europa.eu, 2018). Furthermore, The Republic of Croatia has a total budget of ESIF funding of over €10 billion in the period 2014-2020, through 4 national programs. The planned EAFRD financing for The Republic of Croatia in the period 2014-2020 is over €2 billion (cohesiondata.ec.europa.eu, 2018). Implementation of before mentioned EAFRD funds until the end of 2017 accounted for 25% spent (€591 512 859) out of 48% financing decided (€1 137 522 211) (cohesiondata.ec.europa.eu, 2018). The past century was marked by wars that led to many changes that directly affected the standard of living of the population in rural areas. Croatian villages throughout history had passed through 3 big stages (Župančić, 2000). The first stage marks the period until the end of World War II, the second stage until the 1990s and the third stage represents the transitional period since the 1990s. In the Republic of Croatia, on the basis of data from the Register of Agricultural Holdings/Farms it is evidenced that there is a continuous depopulation of farmers and agricultural holdings/farms. From 2010 to 2016, the total number of agricultural holdings/farms decreased from 198,029 to 170 515. In addition to the persistent depopulation trend, the structure of the agricultural holdings/farms was marked by the aging of the population engaged in agriculture. Most of the farmers are older than 65 yrs, while the share of farmers under the age of 40 is less than 10 percent of total number of agriculture holdings/farms (APPRRR, 2018).

Summarizing all the before mentioned, rural areas in The Republic of Croatia face very difficult times. Therefore, enticing project applications for EAFRD funds among agricultural holdings/farms is of crucial significance for further rural development in The Republic of Croatia. By efficiently using these available allocated funds rural areas in The Republic of Croatia could prevent or reverse the depopulation and migration trends thus keeping people, especially young people in rural areas giving them a stimulus to stay and further develop their farms or other rural based projects, basically, providing them a sustainable future. As a new member of the European Union, in 2013, The Republic of Croatia decided on 16 implementation measures intended for rural development within the Rural Development Program (RDP) in the period 2014-2020 (Ministry of Agriculture of RH, 2018). The main objective of the RDP is to restructure and modernize agricultural holdings/farms and food sectors. It is expected that nearly 2 000 holdings will receive investment support, more than 5 000 farmers will receive start up aid for the development of small family farms and around 1 000 young farmers will get support to launch their businesses during the 2014-2020 period. The program also puts emphasis on the restoration, preservation and enhancement of biodiversity (EC Factsheet on 2014-2020 RDP for Croatia, 2018).

## **2.1. Potential for Rural Development and Key Challenges in the Republic of Croatia**

The Republic of Croatia saw a significant decrease in the share of rural population in the total population over the years. There was 68.4% of rural population in 1961 compared to 31.6% of urban population in that year. The percentage of rural population was 58% in 1971, 48.5% in 1981, 43.8% in 1991, and 42.7% in 2001, and in the last census that number dropped to 39.1% (Župančić, 2000). Deagrarization and deruralization have led to a large number of stateresidents that live in rural areas but do not engage in agricultural activities or agriculture-associated activities. It can be stated that this condition is a significant “*deal-breaker*” in the development of the rural areas and has an effect that 77% of the rural areas of the Republic of Croatia have a characteristic of significant lagging in terms of demographic, socio-cultural and spatial planning (Strategy of Rural Development of Croatia 2008-2013, 2008). Lack of permanent income, old average age of population, low level of education, neglect of architectural heritage, insufficient basic services and infrastructure combined with unresolved ownership issues have resulted in a neglect of rural areas and the loss of youth labor (Rogošić, 2011). The large negative rate of rural population growth is a trend that has several reasons: a low percentage of woman under 45 lives in rural areas, unfavorable living conditions for young families, the preference for a smaller number of children, the decisions of young families to live in urban environments etc. Overall, there is a big difference between the rates of economic growth and the rate of population growth in rural and urban areas and / or between less prospective and more perspective rural areas region. A strong negative growth rate of population

living in rural areas is the result of relative and / or absolute deterioration of the living conditions for young families and the growing trend of migration in urban centers or in more perspective rural / tourist regions (Strategy of Rural Development of Croatia 2008-2013, 2008).

According to Eurostat (2018), the working-age population in 2017 was 3.1 million, of which 1.8 million were active and 1.3 million were inactive. Around 1.6 million were employed and around 205 000 were not. Agriculture provides 7.54% of employment in 2017, industry employment distribution occupies 27.04% and 65.41% of total working population work in services. Average farm size is 5.6 ha. This is considerably less than the average size in the rest of the EU (14.4 ha). Half of all farms are under 2 ha and the vast majority is below 10 ha (89.4%) (Eurostat, 2018). The average economic size of a farm, calculated on the basis of total production value, is € 9 064. Based on this criterion, 40 % of farms are below € 2.000. Average crop yields are lower than in other EU countries due to outdated technologies and frequent droughts. There is a serious structural challenge in some sectors, including fruit, vegetables and livestock sector, because there is a need for investment, modernization, preparation of products for the market and the promotion of production and market organization of farmers, all with the common aim of ensuring stronger productivity growth and creation of new jobs. Croatia is increasingly exposed to extreme weather conditions causing droughts and floods. This is attributed to climate change. However, only around 1 % of agricultural land is irrigated, significantly affecting productivity. Due to the conflicts between 1991 and 1995, 11 000 ha of agricultural land currently contain land mines. Natura 2000 sites cover nearly 37% of the country. The production of renewable energy is quite low. For example, the production of electricity from renewable energy resources accounted for 4, 9 % of total production, with the exception of large hydro plants. Only 2.4 % of the total agricultural land is currently used for organic farming. Due to inadequate management in the past, forest fires or other factors, degraded forms of forest stands now cover 44 % of the total forest land. Due to depopulation, the impact of the war and the long-term economic crisis, there has been low maintenance of infrastructure, social and cultural facilities resulting in a poor availability of basic services for the local rural population (EC Factsheet on 2014-2020 RDP for Croatia, 2018). In addressing these challenges, the Croatian RDP will fund actions under all six Rural Development priorities – with the main priority being Priority 2: Enhancing farm viability and competitiveness of all types of agriculture in all regions and promoting innovative farm technologies and the sustainable management of forests. The four biggest RDP measures in budgetary terms (total public funding) are: € 567 million allocated for Measure 4: Investments in physical assets, € 273 million allocated for Measure 13: Payments in areas facing natural or other specific constraints, € 226 million allocated for Measure 7: Basic services and village renewal in rural areas, € 226 million allocated for Measure 6: Farm and business development (EC Factsheet on 2014-2020 RDP for Croatia, 2018).

## 2.2. Croatian Development Index and Measure M06

Administratively, the Republic of Croatia is divided into 21 units of regional self-government classified at NUTS 3 level, of which 20 counties and the City of Zagreb which is a special administrative unit. There are 556 units of local self-government, of which 127 are classified as cities and 429 are municipalities in accordance with the Law on Local and Regional Self-Government. In the statistical sense, the Republic of Croatia is divided into two NUTS 2 regions: Continental Croatia and Adriatic Croatia. In 2012, almost 80% of the Croatian land area was classified as predominantly rural, an area that is considerably higher than the EU-27 average, where the average is 51.3%. More precisely, according to Eurostat' urban / rural typology, 79.1% of Croatian land surface is classified as predominantly rural, 19.8% as mixed, while only 1.1% (CI-3) areas are classified as predominantly urban area categorized by NUTS-3 region level (Rural development Programme for Croatia 2014-2020, EC, 2014). Given the high significance of rural areas in the Republic of Croatia in every possible way and problems of rural areas already mentioned in the paper, it is an imperative to develop tools to further decrease the differences (especially in socio-economic terms, among others) between urban and rural areas in the Republic of Croatia. According to the current Law on Regional Development of the Republic of Croatia (ZRRRH) (Official Gazette no. 147/14, 2014), it is the policy objective of rural development to contribute to the socio-economic development of the Republic of Croatia, in accordance with principles of sustainable development, and to create conditions that will enable all parts of the country to be competitive and fulfill its own development potential. To achieve this goal, the regional development policy is made to ensure: the linkage of local and regional development needs with development priorities of the central level and achieving goals of the European Union cohesion policy; supporting less developed areas for maximization and optimization in using their own development potential by addressing the causes of their developmental difficulties; implementing appropriate measures for an even and sustainable development of local and regional self-government units in the border area; fostering territorial cooperation and effectively leveraging structural and investment resources of the European Union funds intended for regional and urban development (CLER, 2017).

As the umbrella document of regional policy implementation, ZRRRH prescribes evaluation and classification of units of local and regional self-government according to the degree of development and determines the method of determining which the assisted areas are (ZRRRH, 2014). Evaluation and classification of local and regional self-government units is performed on the basis of the calculation of the development index value, a composite weighted indicator of selected socio-economic indicators. Method of calculation, indicators for calculation of development index, share of individual indicator in the total value of development index and other related issues are regulated according to the Regulation of the

Government of the Republic of Croatia (Official Gazette no. 63/10, 2010 & Official Gazette 158/13, 2013). Development index according to ZRRRH is an instrument for assessing the socioeconomic level of development and evaluation of the degree of development of local and regional self-government units and for categorization of assisted areas. Therefore, it can be stated that the development index is one of key instruments of the regional policy of the Republic of Croatia. This is also confirmed by the approach The Ministry of Regional Development and EU Funds (MRRFEU) used on occasion of introducing a unified system for assessing the development of all territorial units based on the development index. MRRFEU estimates how such an approach contributes to simplicity and transparency of the whole system, allowing for directing better incentives and acquiring better foundations for including or excluding assisted area units for which the State additionally cares (MRRFEU, 2018). According to the Development Index Regulation, which is in effect since April 2010, the development index is calculated on the basis of following indicators (Marcelić, 2011): unemployment rate, per capita income, budget revenues of local and regional self-government units, migrations, aging rate and education rate. Regional self-government units are divided into four groups (MRRFEU, 2018): I. group of regional self-government units that are ranked according to index values in the second half of the sub-ranked units of regional self-government; II. group of regional self-government units which, according to the value of the index, are in the first half of the sub-ranked units of regional self-government; III. group of regional self-government units which, according to the index values, are in the second half of the above-ranked units of regional self-government; IV. group of regional self-government units which, according to the index values, are in the first half of the above-ranked ranking units of regional self-government. Local self-government units or LAU2 (Local Administrative Units) units in The Republic of Croatia are divided in 8 development groups. Local self-government units with Development index below average (under 100%) are distributed in four groups with equal number of units forming Groups I, II, III and IV. Units with Development Index above average are also distributed in four equal groups forming Groups V, VI, VII and the most developed Group VIII (regionalni-en.weebly.com, 2018). As such, Croatian Development Index is an important part of selection criteria (or ranking criteria) within Measure 06 of Croatian Rural Development Programme. Specifically, Measure 06 is orientated to Farm and business development in rural areas. Measure 06 is divided into four sub-measures, each directed to address a specific issue within farm and business development segment. Measure 06 is designed to help a very high number of small agricultural holdings with weak economic sustainability and the significant migration trends of younger people from rural areas as a result of poor living and working conditions for young families, low employment opportunities due to lack of economic viability and the employment opportunities in urban centers (Rural development Programme for Croatia 2014-2020, EC, 2014). Sub-measures are intended to encourage the development of small farms which are potentially economically sustainable. Diversification into non-

agricultural activities contributes greatly to the creation of new jobs as a response to the slowdown of economic activity which rural areas are facing today. Sub-measures are the following: Sub-measure 6.1. Business start up aid for young farmers, Sub-measure 6.2. Business start up aid for non-agricultural activities in rural areas, Sub-measure 6.3. Business start up aid for the development of small farms, Sub-measure 6.4. Support for investments in creation and development of non-agricultural activities (Croatian RDP, 2015). In this paper, Sub-measure 6.3. is examined more closely regarding the special distribution of funds awarded within this framework, as given the high number of small agricultural holdings in the Republic of Croatia, it can be considered as a powerful tool to “kick start” their business development. The survival and development of small agricultural holdings is based on the need for restructuring and increasing their added value through modernizing their basic assets. This type of operation shall provide support to small, potentially sustainable farms which are oriented towards market production in accordance with market requirements, but which lack the basic resources. This will help small farms in their transition towards market oriented production become commercially viable, which is a precondition for achieving competitiveness in the agriculture sector. In Croatia there are 93.080 farms which are between EUR 2.000 SO and 7.999 SO. These farms have a broad significance in the rural area from the point of the rural population, environmental protection and biodiversity conservation as such. Through this support, small farms will be provided with the possibility of achieving economic sustainability, as well as carrying out other activities set out in their business plans (transformation to organic production, diversification, modernizing assets etc.). In their business plans they need to clearly define the inputs, activities and goals to be achieved in the next three years. This type of operation contributes to Focus Area 2A and responds directly to Need 6 (Rural development Programme for Croatia 2014-2020, EC, 2014). The selection criteria for the eligible projects within Sub-measure 06, is published together with the call for proposals based on the following principles in order to achieve objectives set under this type of operation: size of farm (farms with higher SO are prioritized); impact of planned activities on the environment (positive impact on environment is prioritized); level of economic development of the area where the operation is located (investments in area with lower DI (development index) are prioritized). Only operations reaching a minimal threshold score are funded within this sub-measure. The value of public support per beneficiary is EUR 15.000. The support shall be paid in two installments over a period of maximum three years. Payment of the last installment will be conditional on the correct implementation of the business plan within the prescribed time period. According to this principle, at the time of conducting this research it was only possible to determine the funds awarded, not funds payment, as their three-year conditional period has not yet officially ended for most of applicants.



### **3. METHODOLOGY**

#### **3.1. Aims and Research Questions**

The purpose of conducting this study is to determine spatial distribution of EU funds for rural development. The study aims to explore the status of small agricultural holdings/farms regarding their specific economic value and distribution of awarded EU funds within the last public proposal results available at time of writing the study. The aim of this paper is to provide empirical evidence on associations between the indicators of Croatian Development Index and spatial distribution of EU funds awarded within the Rural Development programme in The Republic of Croatia based on available data for the most recent public proposal for EAFRD funds. The research questions which guided the study are as follows:

- What is the spatial distribution pattern of awarded EU funds for small agricultural holdings?
- Is the number of awarded grants to small agricultural holdings that reside in areas with lower Development Index greater of those that reside in areas with higher Development Index?
- Is Development Index criteria for allocation of EU funds sufficient for prioritizing rural areas with lower Development Index?
- How strong are the correlations of DI indicators regarding the number of awarded grants of EU funds for small agricultural holdings in the Republic of Croatia?

#### **3.2. Research Method**

The research was conducted on a sample of 996 awarded grants/applications amounting to 113 358 961, 23 HRK of the last public proposal results within the Sub-measure 6.3.1. (APPRRR, 2018). Descriptive statistics were used in order to clearly and efficiently display the obtained results. In order to compare the number of awarded grants to DI value of the area in which the agricultural holding reside, Pearson Correlations were used to measure the strength of association between the variables. QGIS software was used to determine the spatial distribution of awarded grants/applications.

### **4. RESULTS AND DISCUSSION**

#### **4.1. Results on NUTS 2 classification level**

On a NUTS 2 classification level awarded grants are distributed in favor of least developed groups – Group I and Group II, and the Pearson correlation coefficients confirm that there is a negative correlation ( $r=-0,656521642$ ) in Continental Croatia where as the development group increases the number of awarded grants

decrease. In the Adriatic Croatia, a strong positive correlation between Development Index Group and number of has been determined ( $r=0,765929034$ ), where as the Development Index Group increases the number of awarded grants increases as well. Results show that on a NUTS 2 classification level in Continental Croatia awarded grants are allocated in favor of areas with lower Development Index Group NUTS 2 Self Government Units. In this case, the results are encouraging and the grants are awarded to small agricultural holdings/farms in lesser developed rural areas.

Table 1. Pearson Correlation Coefficients for NUTS 2 classification level

	DI Group NUTS 2	Continental (NUTS 2)
DI Group NUTS 2	1	
Continental (NUTS 2)	-0,656521642	1
	DI Group NUTS 2	Adriatic(NUTS 2)
DI Group NUTS 2	1	
Adriatic (NUTS 2)	0,765929034	1

\*statistically significant at the 0.05 significance level

Source: authors based on M0631 results (3<sup>rd</sup> Proposal) available at: [aprrr.hr](http://aprrr.hr)

The interesting results is that on a NUTS 2 classification level total funds (in HRK) are allocated in favor of Continental Croatia with 69% of the awarded grants allocated to farms residing there and only 31% are awarded to Adriatic Croatia. This is evident from Table 2, as most funds are allocated in Regional Self Government Units categorized as I and II Development Index Group of less developed units. Units categorized as I Development Index Group received 24.358.122, 00 HRK, and units categorized as II Development Index Group received 32.550.548, 79 HRK, which is much higher than III and IV, that received 7.169.794, 50 HRK and 13.771.351, 05 HRK respectively. At the same time, allocated funds are differently distributed in Adriatic Croatia. As evidenced in Table 2, Regional Self Government units that are ranked Development Index Group III and IV (more developed) received 17.867.040, 06 HRK and 12.975.799, 83 HRK which is substantially higher than units labeled as I and II Groups.

Table 2. Awarded Grants on NUTS 2 classification level (HRK)

Development Index Group of Regional Self-Govern. Units	4	3	2	1
Continental Croatia(NUTS 2)	13.771.351,05	7.169.794,50	32.550.548,79	24.358.122,00
Adriatic Croatia(NUTS 2)	12.975.799,83	17.867.040,06	1.820.752,50	2.845.552,50
TOTAL: 113.358.961,23 HRK	26.747.150,88	25.036.834,56	34.371.301,29	27.203.674,50
n	235	220	302	239
%	23,6	22,09	30,32	24

Source: authors based on M0631 results (3<sup>rd</sup> Proposal) available at: [aprrr.hr](http://aprrr.hr)

This can be connected to criticism of Development Index measurement that states that the DI gives priority to the level of development of units and not the level of development of human factor (human development) and that coastal regional self government units have higher incomes and financial assets (do to tourism activities that are not so highly present in the Continental Croatia as they are in Adriatic Croatia) but have lesser paid, lesser educated and older people, but are still categorized in higher Development Index Groups of regional self government units (Marcelić, 2011).

#### 4.2. Results on NUTS 3 classification level

On a regional self government level or NUTS 3 level of classification the Republic of Croatia is divided in 20 counties and the city of Zagreb. Counties with the highest number of awarded grants or funds (n x 15.000€) are Splitsko-dalmatinska (12%) which is categorized as DI Group 3, Osječko –baranjska (11%) which is categorized as DI Group II and Bjelovarsko-bilogorska (8%) which is categorized as DI Group I. 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> place is occupied by 2 counties and the city of Zagreb that are in the highest DI development group IV (Picture 1).

Table 3. M0631 results on NUTS 3 classification level

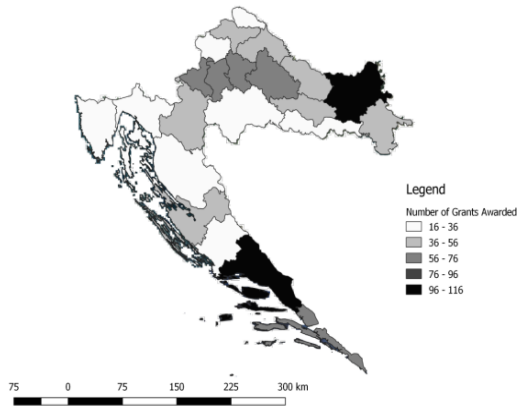
Regional Self Government Unit	n	n %	Awarded Funds	Funds %	DI Group	DI Group Total Funds	DI Group p%	Total n
Zagrebačka	57	6%	6.487.578,00 kn	6%	4	26.747.150,88 kn		
Grad Zagreb	64	6%	7.283.773,05 kn	6%	4		n	235
Primorsko-goranska	27	3%	3.073.002,78 kn	3%	4			
Istarska	21	2%	2.390.440,50 kn	2%	4			
Dubrovačko-neretvanska	66	7%	7.512.356,55 kn	7%	4		23,60 %	23,59 %
Varaždinska	45	5%	5.120.845,50 kn	5%	3	25.036.834,56 kn		
Međimuska	18	2%	2.048.949,00 kn	2%	3		n	220
Zadarska	41	4%	4.666.260,00 kn	4%	3			
Splitsko-dalmatinska	116	12 %	13.200.780,06 kn	12%	3		22,09 %	22,09 %
Krapinsko-zagorska	31	3%	3.528.535,50 kn	3%	2			
Karlovačka	49	5%	5.577.294,00 kn	5%	2	34.371.301,29 kn	n	302
Koprivničko-križevačka	45	5%	5.120.763,00 kn	5%	2			
Požesko-slavonska	48	5%	5.463.444,00 kn	5%	2			
Osječko-baranjska	113	11 %	12.860.512,29 kn	11%	2			

Šibensko-kninska	16	2%	1.820.752,50 kn	2%	2		30,32%	30,32%
Sisačko-moslavačka	33	3%	3.756.196,50 kn	3%	1	27.203.674,50 kn		
Bjelovarsko-bilogorska	75	8%	8.536.312,50 kn	8%	1		n	239
Virovitičko-podravska	43	4%	4.894.606,50 kn	4%	1			
Brodsko-posavska	24	2%	2.731.617,00 kn	2%	1			
Vukovarsko-srijemska	39	4%	4.439.389,50 kn	4%	1			
Ličko-senjska	25	3%	2.845.552,50 kn	3%	1		24,00%	24,00%
TOTAL	996	100%	113.358.961,23 kn	100%		113.358.961,23 kn	100%	100%

Source: authors based on M0631 results (3<sup>rd</sup> Proposal) available at: [aprrr.hr](http://aprrr.hr)

Dubrovačko-neretvanska received 66 awarded grants within Sub Measure M0631 with total allocation of funds amounting to 7.512.356, 55 HRK and comprising 7% of total allocated funds. The City of Zagreb and the Zagreb County received total awarded funds of 7.283.773, 05 HRK and 6.487.578, 00 HRK, comprising approximately 6%. All three units are categorized as Development Index Group IV (most developed in regional self government units), with the number of awarded grants 64 and 57 respectively. Most developed group of regional self government units (DI Group IV) holds 23, 60% of total fund allocation within Sub Measure M0631, or 26.747.150, 88 HRK and 235 awarded small agricultural holdings. Development Index Group III holds 25.036.834, 56 HRK or 22, 09% of total awarded funds or 220 awarded small agricultural holdings. Regional self government units that are categorized as Development Index Group II hold 34.371.301, 29 HRK or 30, 32% of total awarded funds. Development Index Group I (least developed) hold 24, 00% or 27.203.674, 50 HRK of total awarded funds. It can be noticed that awarded funds in Development Index Groups I, III and IV are almost evenly distributed and only Development Index Group II stands out at 30, 32% of total awarded funds.

Picture 1. Spatial Distribution of M0631 Awarded Grants (NUTS 3)



Source: authors based on M0631 results (3<sup>rd</sup> Proposal) available at: [aprrr.hr](http://aprrr.hr)

Statistically significant correlation has been determined between the number of awarded grants and the Development Index Groups of counties that are divided in 4 groups (below average I and II, above average III and IV groups of development) (Table 4,)

Table 4. Pearson Correlation Coefficients for NUTS 3 classification level

	DI Group of Regional Self Govern.	AwardedGrants
DI Group of Regional Self Government Units	1	
AwardedGrants	-0.334776233	1

\*statistically significant at the 0.05 significance level

Source: authors based on M0631 results (3<sup>rd</sup> Proposal) available at: [aprrr.hr](http://aprrr.hr)

The results show a small negative correlation ( $r = -0,334776233$ ) between Development Index Group of Regional Self Government Units (Counties) and Awarded grants, which is explained as the development group of a unit increases the number of awarded grants decrease respectively.

### 4.3. Results on LAU2 classification level

On the Local Self Government Level, which is the level of Development Index Groups on a local level that is used in determining the Development Index criteria for M0631 call for proposals, the results show certain disparities. We can see that the most awarded funds are allocated in the most developed group of LAU2 (Local Administrative Unit) units, VIII and IV, followed by VI and III, then I and VII and at the end V and II (Table 5.)

Table 5. M0631 results on LAU2 classification level

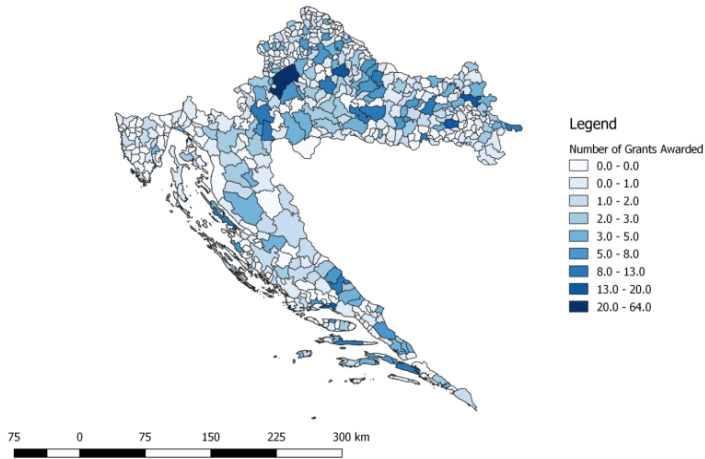
LAU 2 Development Groups	Funds	Funds%	(n)	(n) %
8	17.755.443,33 kn	16%	156	16%
7	12.861.261,69 kn	11%	113	11%
6	14.568.778,50 kn	13%	128	13%
5	12.747.324,39 kn	11%	112	11%
4	17.185.811,10 kn	15%	151	15%
3	14.567.178,72 kn	13%	128	13%
2	10.811.323,50 kn	10%	95	10%
1	12.861.840,00 kn	11%	113	11%
TOTAL	113.358.961,23 kn	100%	996	100%
AboveAverage	57.932.807,91 kn	51%	509	51%
BelowAverage	55.426.153,32 kn	49%	487	49%
TOTAL	113.358.961,23 kn	100%	996	100%

Source: authors based on M0631 results (3<sup>rd</sup> Proposal) available at: [apprrr.hr](http://apprrr.hr)

The 51% of funds are allocated in the above average (100%) Development Index Groups of LAU2 units and 49% in the below average groups. The results of the study on LAU 2 level show that slightly more funds are ending up in the above average developed local self government units. This indication should be observed carefully because we have to take into account certain outliers, like the city of Zagreb or LAU2 units that have much higher number of population meaning that units with higher numbers of population also mean higher rate or number of applicants, but nevertheless, analysis showed that on a LAU2 level most of the awarded grants still end up in highly developed units, taking into account warnings from certain local government officials that they are unjustifiably categorized in the higher development groups that can be generalized to small agricultural holdings applications as well; and certain before mentioned criticism of Development Index (Marcelić, 2011), the findings should be taken into account when devising or revising Development Index basis or Development Index criteria within call for proposals in the future.

When looking into spatial distribution of awarded funds based not on cumulative funds awarded for specific LAU2 group of Development but for the Development Level of single Local self government unit, we can observe a spatial pattern that is quite mosaic. It can be observed that the highest numbers of grants are allocated in single LAU2 units in the continental Croatia (NUTS 2).

Picture 2. Spatial Distribution of M0631 Awarded Grants (LAU 2)



Source: authors based on M0631 results (3<sup>rd</sup> Proposal) available at: [aprrr.hr](http://aprrr.hr)

Again, taking into account specific areas that can be considered outliers (above all the city of Zagreb – still people from Zagreb not necessarily perform their agricultural work in the city but elsewhere and only their HQ are registered in the City of Zagreb).

Pearson correlation coefficients analysis showed that when looking at single LAU2 unit development index there is a small positive and statistically significant correlation for every Development Index Indicator and the number of grants. The overall Development Index and correlation with the number of awarded grants shows a small but positive correlation of  $r=0,176782224$ ; meaning that as the value of the Development Index increases the number of awarded grants increase as well. The coefficients are given in the next table:

Table 6. Pearson Correlation Coefficients for LAU 2 classification level

PearsonCorrelationCoefficients	LAU2
Indicators	Number of Awarded Grants (n)
Development Indeks	0,176782224
Incomepercapita	0,176544328
Income of local/regional budget per capita	0,105365351
Unemployment rate	-0,015884556
Populationchange	0,057380578
Aging indeks	-0,034346375
Rate of Education	0,339002927

\*statistically significant at the 0.05 significance level

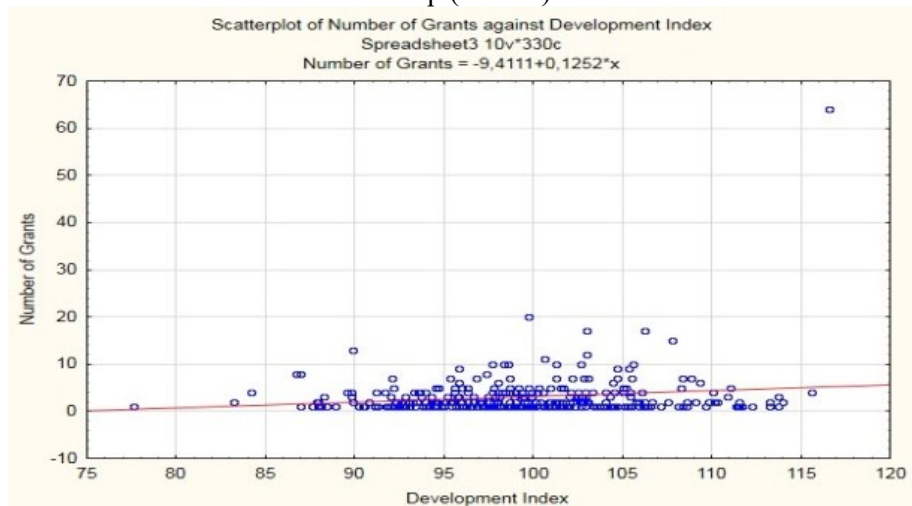
Source: authors based on M0631 results (3<sup>rd</sup> Proposal) available at: [aprrr.hr](http://aprrr.hr)

The results of the study regarding the specific Development Index Indicators that are used in calculating the overall Development Index of a unit are:

- There is a small positive correlation between income per capita and number of grants meaning that as the income per capita increases the number of grants rise as well ( $r=0,176544328$ ),
- There is a small positive correlation between income of local budget per capita and number of grants meaning that as the income of local budget per capita increases the number of grants rise as well ( $r=0,105365351$ ),
- There is a small negative correlation between unemployment rate and number of grants meaning that as the unemployment rate increases the number of grants fall ( $r=-0,015884556$ ),
- There is a small positive correlation between population change and number of grants meaning that as the population increases the number of grants rise as well ( $r=0,057380578$ ),
- There is a small negative correlation between aging index and number of grants meaning that as the aging index increases the number of grants fall ( $r=-0,034346375$ ),
- There is a medium positive correlation between rate of education and number of grants meaning that as the rate of education increases the number of grants rise as well ( $r=0,339002927$ ).

A scatterplot summarizes the results (Graph 1.). Overall, there was a small, positive correlation between number of awarded grants and the Development Index of a single LAU 2 unit.

Graph 1. Scatterplot of Number of Awarded Grants against Development Index Group (LAU 2)



Source: authors based on M0631 results (3<sup>rd</sup> Proposal) available at: [aprrr.hr](http://aprrr.hr)



Increases in number of awarded grants were correlated with increases in Development Index of single LAU 2 local self government units. As mentioned before in the paper, the City of Zagreb is an outlier that was taken into account when reading the results.

## **5. LIMITATIONS AND IMPLICATIONS FOR FURTHER RESEARCH**

Further research might consider including a larger sample (possibly including results from all Sub Measures when they are available) and should focus not solely on a single Sub Measure but include other Measures within the Croatian RDP or other correlating Measures and Sub Measures within the RDP. Also, given that payment data is still not available because the process is not yet completed (applicants three year period for reaching defined objectives has not yet passed); when the data becomes available, further research into payments within the Sub Measure should provide more useful data and help investigate the impact of the M0631.

## **6. CONCLUSION**

Development Index is an important part of RDP funds allocation criteria, but given the results of the study, Development Index based criteria should be further developed or revised in the future to allow least developed areas an easier access to RDP funds and entice a higher rate of applications and thus enable success of RDP implementation. Giving priorities to least developed areas based solely on Development Index based criteria will not be enough in the future but special interest has to be given to the internal factors influencing the rate of RDP funds applications at the level for small agricultural holdings. Internal factors influencing the rate of RDP funds applications of small agricultural holdings need to be determined in order to provide additional measures or programs outside RDP to increase the rate of applications (especially those from least developed groups). Before mentioned measures should be provided on a local and national level as well. At the local level, significant progress can be made in education and in specific LAG (Local Action Groups) projects strengthening local communities (including small agricultural holdings). On the national level (APPRRR), simplifying the procedures for smaller grants and prolonging the application periods should be considered as a first base measure for higher rate of applications.

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