International Journal of Research and Review
Vol. 10; Issue: 4; April 2023
Website: www.ijrrjournal.com
Research Paper *E-ISSN: 2349-9788; P-ISSN: 2454-2237*

Analysis of the Potential of Natural Resources and Human Resources to the Regional Income of Karo Regency

Rosti Br Perangin Angin[1], Rujiman[2], Rahmanta[3]

[1]Posgraduate Students, Faculty of Economics and Business, Department of Economics, Universitas Sumatera Utara, Indonesia
[2,3]Postgraduate Lecturer, Faculty of Economics and Business, Department of Economics, Universitas Sumatera Utara, Indonesia

Corresponding Author: Rosti Br Perangin Angin

DOI: https://doi.org/10.52403/ijrr.20230434

ABSTRACT

Regional Revenue is the right of the regional government which is recognized as an addition to net worth. GRDP per capita is the GRDP of an area divided by the number of people living in that area. The potential of natural resources and human resources has an effect on regional income and then has an effect on per capita income. In this study the authors examined how the influence of natural resources and human resources on the regional income of Karo Regency, and raised the title: "Analysis of the Potential of Natural Resources and Human Resources on PDRB Per Capita of Karo Regency. The data in this study is secondary data sourced from BPS Karo Regency and BPS North Sumatra. To determine the effect of potential natural resources on GRDP per capita, the GRDP data for agriculture, forestry and fisheries are taken. To find out the effect of potential human resources on GRDP per capita, health GRDP data is taken. The data is processed through multiple linear regression data processing, processed using Eviews. Based on the results of the study, it was found that the GRDP of agriculture, forestry and fisheries) has a positive effect on GRDP per capita, GRDP for Health has a negative effect on GRDP per capita.

Keywords: *Regional Income, Per Capita GRDP, Business Field GRDP, Natural Resources, Human Resources.*

INTRODUCTION

Karo regency is a Regency in the province of North Sumatra, Indonesia. The capital of the district is located in kabanjahe district. Karo regency has an area of 2,127.25 km^2 and a population in 2020 of 404,998 people, with a density of 190 people/km^2.

Karo regency is located in the Karo Highlands, Bukit Barisan, North Sumatra. Located as far as 77 km from the city of Medan, the capital of North Sumatra province. Karo Regency area is located on a plateau with an altitude between 600 to 1,400 meters above sea level. Because it is located at such an altitude, Tanah Karo Simalem, another name of this district has a cool climate with temperatures ranging from 16 to 17° C.

Karo regency has the following territorial boundaries: North: Langkat regency and Deli Serdang regency, East: Simalungun Regency and Samosir regency, South:Dairi Regency, West: Southeast Aceh Regency (Aceh province)

Karo regency is rich in Natural Resources, the potential of Natural Resources in karo Regency: fertile soil, cool air, beautiful panorama, extensive protected forests, geothermal, sulfur, limestone, dolomite, phosphate, calcite, clay, marble, tourism sector from nature.

Management Of Natural Resources Potential Karo District

According to KBBI, what is meant by potential is the ability that has the possibility to be developed. Potential also means strength, ability, or power.

Natural resources are everything that can be taken or utilized from nature because it has a beneficial value to meet human needs.

The potential of natural resources can mean everything that can be taken or utilized from nature and then there is the possibility to be developed.

Karo regency has the potential of natural resources that can be managed to contribute to the regional income of Karo Regency. One of the goals of the regional development of Karo regency is the welfare of the population. The level of welfare can be measured using the Human Development Index, because the Human Development Index describes how the population can access the results of development in obtaining income, health, education, and so on. HDI is formed by 3 (three) basic dimensions, namely : longevity and Healthy Living, Knowledge and decent living standards.

One element that must be considered to meet the three dimensions of the Human Development Index is income.

Furthermore, income is influenced by the resources owned by the region. Natural Resources is one of the important elements that affect the regional income of karo Regency, because Karo regency is rich in natural resources.

Managing the potential of Natural Resources Efficiently and effectively is one part of the mission of the Karo Regency government contained in the 3rd mission, namely : optimally developing agriculture, tourism, agribusiness-based industry and trade that are competitive and environmentally sound as well as forest preservation and critical land rehabilitation.

Then further in the field of Natural Resources and the environment Set 2 (two) development programs, namely :

1. Forest and Land Development Program, this Program aims to:

1) Conserve water resources through the preservation and protection of forests
2) Protecting critical lands;
3) Improving forest quality and productivity through optimal forest management; and
4) Improve forest surveillance from tenants / destruction and illegal logging activities.

The target of this Program is:

1) Karo natural resources remain sustainable and sustainable;
2) Improved Production Forest Management;
3) Increasing the role of protected forests and conservation forests;
4) Reduce theft, forest encroachment, as well as forest fires;
5) Stability of forest area status;
6) The maintenance of the functions of conservation areas, protected areas, biodiversity in the use and management of land and forests; and
7) The reduction of critical lands within the forest area and outside the forest area of karo Regency.

Principal activities include:

1) Affirmation of the boundaries of protected forests, conservation forests, community forests and / or production forests;
2) Affirmation of the green path of the river;
3) Implementation of reforestation or reforestation of forest areas that have been damaged;
4) Protection of Springs san water sources;
5) Organizing and conservation and rehabilitation of damaged forest areas and critical land;
6) Development and implementation of an inventory of forest resources and forest products and their environmental services; and
7) Development of forest and critical land monitoring system and consistent law enforcement.

2. Program of Natural Resources utilization and Conservation of Natural Resources and the environment

This Program aims to improve the management of Natural Resources and the environment through good governance based on the principles of transparency, participation, and accountability.

The goal of the program is to increase the capacity of Natural Resource Management and the environment so that existing natural resources can be utilized optimally, fairly and sustainably which is supported by the quality of a clean and healthy environment.

The main activities in this program are as follows:

1) Protect and secure the natural resources of karo Regency;
2) Prevent pollution of water sources and bodies;
3) Regulation of mining and energy business;
4) Improving land conservation to increase productive life in Natural Resources Management;
5) Improving facilities and infrastructure services in the field of Natural Resources;
6) Forest Fire Prevention and control;
7) Assessment of Natural Resources Protection and conservation policies;
8) Strengthening facilities and infrastructure of Conservation Area Management;
9) Coaching and development of nurseries for rehabilitation and greening and;
10) Improved Performance of Environmental Impact Assessment (EIA).

Potential Management of Natural Resources by Human Resources in karo regency produce :

1) Food crops, based on data from the Karo Regency Agriculture Office, the area of land in karo regency in 2019 was 14,500 ha. The area consists of 98.14 percent of irrigated land and 1.86 percent of irrigated land.
2) Horticulture, in 2020, the production vegetable crops such as onion was 8,216 tons, chili was81, 790 tons, potato was 70,367 tons and cabbage was 134,718 tons. As for the harvested area of vegetable crops such as onions is 806 ha, chili is 8,045 ha, potatoes 3,676 ha and cabbage is 1,451 ha.
3) Plantation, in 2019, the total area of plantations in Karo Regency, such as oil palm heads, was 1.91 ha, for coconut was 0.82 ha, rubber was 0.14 ha, cocoa was 4.02 and coffee was 9.75 ha. As for plantation production in Karo regency, for oil palm amounted to 6.05 tons, coconut 0.83, rubber amounted to 0.07 tons, coffee amounted to 13.44 tons and cocoa amounted to 3.20 tons.
4) Livestock, livestock that dominate in karo regency in 2019 are pigs with a total of 28,132 heads of livestock, then there are goats and sheep with a total of 28,132 heads. While in the poultry population, the most animals are free-range chickens as many as 379,339 heads.
5) Fisheries, from Fisheries Department data, there are 805 fishery households (RTP) that use ponds, 9 RTP that use Lakes , 1 RTP that uses fish seed halls, and 19 RTP that use dam/reservoir checks to carry out cultivation in 2020 in Karo Regency.5.6 Forests, the area of protected forests in Kabupaten Karo in 2020 was 64,566 ha and the area of nature reserve forests was 46,184 ha.

Karo Regency Natural Resources Potential

1) Agriculture

Table 1 Karo Regency Agricultural Natural Resources Potential

No	Agricultural Products	No	Agricultural Products
1	Avocado	12	Guava Air
2	Onion	13	Guava Seed
3	Red Onions	14	Oranges
4	Garlic	15	Long Beans
5	Bean	16	Land Beans
6	Flowers	17	Potatoes
7	Big Pepper	18	Cabbage Flowers
8	Cayenne Pepper	19	Kubis
9	Duku	20	Siam Pumpkin
10	Durian	21	Radish
11	Maize	22	Passion

Source: Karo Regency Agriculture Office

2) Tourism

Table 2 Karo Regency Tourism Natural Resources Potential

No	Tourism	No	Tourism
1	Lake Toba	7	Gundaling Hill
2	Sipiso piso waterfall	8	Lau Kawar Lake
3	Sikulikap Waterfall	9	Lau Debuk hot spring
4	Mount Sibayak	10	Mountain Spirit Hot Spring
5	Mount Sinabung	11	Bukit Barisan Forest Park
6	Tongging	12	Gua Liang dahar

Source: Karo Regency Tourism Office

3) Plantation

Potential plantation resources in Karo regency include: Candlenut, Cocoa and Coffee

4) Forestry

The area of Forest in Karo Regency according to the decree of the Minister of Forestry No. 44 / Menhut-II / 2005 dated February 16, 2005 covering an area of 128,820. 51 Ha with the following details :

Table 3 Natural Resource Potential Karo Regency Forestry

No	Principal Functions	Forest Functions	Broad (Ha)
1	Conservation Forest Area	Nature Reserve and Nature Conservation Area	22.880,04.
2	Protected Forest Area	Protected Forest	76.498,47.
3	Production Forest Area	Limited Production Forest Permanent Production Forest	14.919,66. 14.522,34.
	Total		128.820,51.

5) Production potential and non timber benefits.

1. Tapping Pine Sap : 1,500 Ha.
2. Potential of various types of rattan: there is no data on the type and extent
3. Swallow's Nest: Liang Dahar cave and Simungkur cave
4. Permanent Production Forest : 14,522. 34 Ha

6) Natural Tourism Potential.

1. Bukit Barisan Forest Park
2. Deleng Lancuk
3. Mount Sinabung
4. Mount Sibayak
5. Mount Sipiso Piso

7) Mining and Energy Potential in Karo Regency

Table 4 Natural Resource Potential Karo Regency Mining

No.	Mining and Energy Potential	Location	Deposit Amount	Stages Of Research	Description
1	**2**	**3**	**4**	**5**	**6**
	Mining of nonmetallic minerals and rocks				
1.	Geothermal	Mount Sibayak Ds. Mountain Spirit Merdeka district E=98.505800 N=3.227670	240 MW ***	Exploitation	Unexpected reserves of 68 MW and has been and is being exploited by PT. Pertamina (Persero) 1.6 MW where the Steam is sold to PT. Dizamatra Powerindoproduce 2 x 5.65 MW
		Mount Sinabung Umbrella district	250 MW ***	Preliminary research	Not yet exploited
2.	Sulfur	Mount Sibayak Merdeka district E = 98.516800 N = 3.233020	174.900 ton ***	Detailed exploration	Has 99.5% Sulfur (S) and has been exploited by PT. Delisulfurindo.
		Mount Sinabung Umbrella district E = 98.393200 N = 3.169370	17.200 ton ***	Preliminary research	Has never been exploited
3.	Limestone	Ds. Laubuluh Kuta buluh district E = 98.256671 N = 3.194342	2.185.000 ton **	Preliminary research	Has never been exploited
		Ds. Tanjung Mbelang Tiganderket district	345.000 ton **	Preliminary research	Has never been exploited
		Ds. Lau Solu	Not yet	-	Has never been exploited

		Mardinding district	known **		
		Ds. Mardinding Mardinding district E = 98,013230 N = 3,237129	14 millyar m3 *	Preliminary research	Has never been exploited
4.	Dolomite	Ds.Desa Laubuluh Kutabuluh district	Not yet known **	-	Not yet exploited
		Ds. Kutakepar Tiganderket district E = 98,342886 N = 3,171409	15 million m3 *	Preliminary research	Already exploited
		Ds. Mardinding Tiganderket district	Not yet known **	-	Not yet exploited
		Ds.Kutabuluh Gugung Kec. Kutabuluh	Not yet known **	-	Not yet exploited
		Ds. Susuk Tiganderket district E = 98,346604 N = 3,164195	15 million m3 *	Preliminary research	Already exploited,
		Ds. Tanjung Bale Laubaleng district E = 98,105795 N = 3,074123	Not yet known *	Preliminary research	Not yet exploited
5.	Phosphate	Ds. Laubuluh Kutabuluh district	Not yet known **	General inquiry	Not yet exploited
6	Calcite	Ds. Mbal-mbal Petarum Laubaleng district	Not yet known **	General inquiry	Not yet exploited
7.	Clay	Ds. Laubuluh Kutabuluh district	500 million m3 *	Preliminary research	Not yet exploited
8.	Marble	Ds. Mardinding Mardinding district	1.552.233 m3 **	General inquiry	Not yet exploited
		Ds. Mbal-mbal Petarum Laubaleng district	Not yet known **		Being tracked by investors
		Ds. Laubuluh Kutabuluh district E = 98,283846 N = 3,197792	4.191.000 ton *	Preliminary research	Not yet exploited
9.	Sirtu	Karo regency (scattered)	Not yet known ***	General inquiry	Some have been exploited
10.	Trass	Ds. SarinembahKec. Munthe	Not yet known **	Preliminary research	Not yet exploited
		Ds. Tanjung Beringin Munthe district E = 98,379944 N = 3,057775	2.000.000 ton *	Preliminary research	Not yet exploited
		Ds. Seberaya Kec. Tigapanah	11.000.000 ton **	Preliminary research	Not yet exploited
		Ds. Narigunung Payung district	13.000.000 ton **	Preliminary research	Not yet exploited
11.	Andesit	Ds. Tongging Merek district E = 98,530167 N = 2,897972	20 million m3 *	Preliminary research	There are already traditionally mined
		Ds. Sikodon-kodon Merek district E = 98,521198 N = 2,865306	15 million m3 *	Preliminary research	Not yet exploited
		Ds. Situnggaling Merek district E = 98,536460 N = 2,934737	10 million m3 *	Preliminary research	Not yet exploited
12.	Feldspar	Ds. Sikodon-kodon Merek district E = 98,493044 N = 2,876525	30 million m3 *	Preliminary research	Not yet exploited
		Ds. Pernantin Juhar district	21 million m3 *	Preliminary research	Not yet exploited

		E = 98,359744 N = 3,022865			
		Ds. Laukapur Tigabinanga district E = 98,203763 N = 3,067876	40 million m3 *	Preliminary research	Not yet exploited
13.	Granit	Ds. Kutambaru Munthe district E = 98,381861 N = 3,030167	70 million m3 *	Preliminary research	Has never been exploited
	Groundwater				
	Boreholes	Spread across the District. Karo	4 million m3/tahun ***	Preliminary research	Some have been used for the daily needs of the community.

Source: Department of Mining and Energy Karo Regency

8) potential of water and Energy Resources

Table 5 Natural Resource Potential Karo Regency water and energy resources

No	Energy Resources	Potential (Total)	Stages Research/ Exploitation	Location	Description
1	Water Potential 1. Lau Biang Singgamanik	45 MW 5 MW	Survey detailsPT Wampu Electric Power Preliminary Research	Villages Rih Tengah Kuta Buluh district Villages Singgamanik. Munte district	Development Time 3 x 15MW PLTA
2	Geothermal: 1. WKP. Sibayak - Sinabung	140 MW	PT. Pertamina Geothermal Sibayak and PT Dizamatra Powerindo	Merdeka district and Namanteran	Sudah dieksploitasi sebesar 2 x 5,6 MW + 1,6 MW

Source: Department of Mining and Energy Karo Regency

Karo Regency Human Resources Potential Management

To support the mission of karo Regent, namely the third mission: to optimally develop agriculture, tourism, industry and trade based on agribusiness that is competitive and environmentally sound as well as forest preservation and critical land rehabilitation, then in the field of human resources Set 1 (one) development program, namely: Program to improve the quality of Labor and employment opportunities

This Program aims to improve the skills, expertise, and competence of karo workforce. The target of the program is the realization of work competency standards and the implementation of competency-based job training.

This Program contains the following main activities:

1. organizing education, training and coaching of youth and sports in order to encourage the development of work competency standards;
2. increased supervision, protection and enforcement of labor laws; and
3. Increased cooperation with labor exchange institutions and with companies/industries.

Table 6 Population Aged 15 And Above According to the type of gender activities in Karo Regency, 2020

Main Activities	Gender		Total
	Men	Girls	
Labor Force	137132	124897	262029
Works	134035	123201	257236
Open Unemployment	3097	1696	4793
Not The Labor Force	16472	33702	50174
Schools	6538	6974	13512
Housekeeping	1542	22250	23792
Other	8392	4478	12870
Total	153604	158599	312203

Table 7 Population aged 15 and over by Education Terminated highs and types of activities in Karo district, 2020

Highest Education	Labor Force			Percentage Employed Against Labor Force
	Works	Unemployment	Number Of Labor Force	
SD	64907	374	65281	99,43
SMP	61660	665	62315	98,95
SMA	100727	2624	103351	97,46
College	29942	1140	31082	96,33
	257236	4793	262029	98,17

Karo District Health Program

Health indicators are variables that can be used to evaluate the state or status and allow it to measurement of changes that occur over time time. The value of these indicators can provide clues or indications about the overall state or a particular population or group people. Health indicators for indicators, age expectancy figures life, the percentage of malnourished toddlers in Karo up to 2019 has been pretty good.

Table 8 Health Indicators Of Karo Regency Year 2015-2019

No	Uraian Description	2015	2016	2017	2018	2019
1	Age of hope life(years)	70,62	70,69	70,77	70,97	71,27
2	Percentage toddler nutrition bad(%)	0,18	0,0013	0,043	0,07	0,08

Source: Karo Regency Health Office, 2020
BPS Karo Regency, 2020

The percentage of health expenditure of Karo regency in 2017-2021, the health budget allocation is in the range of 11% - 26%. This, the government has fulfilled the budget provisions in accordance with the mandate of Law Number 36 In 2009 that the health budget allocation of at least 10% of the budget.

Health development is the main investment for development Indonesian human resources. Health development basically is an effort to increase awareness, willingness, and the ability of each person to be able to behave a healthy life for achieve the highest degree of Public Health. To realize this, the need for development planning systematic Health, directed, integrated and comprehensive, and it requires the involvement of various sectors and all components of the nation in implementation.

Health development according to Law Number 25 years 2014 on the National Development Planning System, aimed at to increase awareness, willingness and ability to live a healthy life for everyone, in order to realize the degree of health of citizens the highest, as an investment for the development of human resources (source Human resources) are socially and economically productive. While Article 2 of Law Number 36 of 2009 and Article 1 of Law Number 36 of 2009 on health, that health is a healthy state, both physical and mental and spiritual and Social, which allows everyone to live productively social and economical.

1) The Ratio Of Hospitals, Health Centers And Health Centers Per Unit Population

Ratio of hospital services to the population of the District Karo in 2019 reached 1 : 83,176, which means that one hospital serves 83,176 residents, ideally one hospital serving 100,000 residents. Karo regency with a population of 415,875 people thus hospitals as much as 5 (five) can already provide services maximum health.

Puskesmas ratio reached 1: 21,888 means one puskesmas serving serving 21,888 residents, while the ratio reaches 1 pustu :1,970 means that 1 pustu serves 1,970 residents. When compared with the concept of Health Center working area where the target population

served by an average of 30,000 puskesmas population, with the number of puskesmas services in Karo regency is below 30,000 residents it is expected puskesmas and pustu can already reach the target population in the area of work.

From these data in the presence of health centers, and pustu in each district health services are expected to be accessible to all residents of Karo Regency. The following table of hospital ratios, the ratio Puskesmas and Pustu Per Karo Regency population. Following

table ratio of hospitals, health centers and Pustu ratio Per number Residents Of Karo District.

Table 9 Ratio of Hospitals and Health Centers ratio, Polindes, Pustu Per Karo Regency Population Year 2015-2019

Description	2015	2016	2017	2018	2019
Number of hospitals	5	5	5	4	5
Number Of Puskesmas	19	19	19	19	19
Total Pustu	230	321	230	161	211
Total Population	389.591	396.579	403.207	409.675	415.878
Union Hospital Ratio Population	1 : 77.918	1 : 79315	1 : 80641	1 : 102418	1 : 83.176
The Ratio Of Puskesmas Unity population	1 : 20.504	1 : 20.872	1 : 21221	1 : 21561	1 : 21.888
Pustu Ratio Of Population Unity	1 : 1.693	1 : 1.235	1 : 1.753	1 : 2.544	1 : 1.970

Source: BPS Karo Regency, 2020

2. Ratio Of Doctors Per Unit Population And The Ratio Of Medical Personnel Per Unit Population

Availability of human resources into supporting factors in improving public health. To support things the government has provided health workers who spread in all districts in Karo Regency. As for the number of health workers in 2018, there were 91 general practitioners,68 specialists, 23 dentists, and 182 medical personnel. The following table is presented 2.40 ratio of health workers in the District With the 2014-2018 season.

Table 10 Ratio Of Health Workers Karo Regency Year 2015-2019

Description	2015	2016	2017	2018	2019
Number Of Doctors					
General Practitioner	85	65	91	91	104
Specialist Doctors	18	18	68	68	61
Dentist	27	17	26	23	35
Number Of Medical Personnel	130	100	185	182	200
Total Population	389.591	396.598	354.242	409.675	415.878
Ratio Of General Practitioners Of The Union Population	1 : 4.583	1 : 6101	1 : 3892	1 : 4501	1 : 3.998
Doctor Ratio Union specialists Population	1 : 21.257	1 : 22033	1 : 5209	1 : 6024	1 : 6.817
Dentist Ratio Population Associations	1 : 14.171	1 : 23329	1 : 13624	1 : 17.811	1 : 11.882
Ratio Of Medical Personnel Population Associations	1 : 2.996	1 : 3965	1 : 1914	1 : 2.250	1 : 2.079

Source: BPS Karo Regency, 2020 (processed)

3. Health Coverage Of Elementary And High School Students

In the minimum health care standards in the District/City for health screening of elementary school students and a targeted level of 100%. In Karo regency in 2017-2018 has reached 100% while in 2019 it only reached 95.23%. More Data presented in the following table.

Table 11 Ratio Of Health Workers Karo Regency Year 2015-2019 Health screening for elementary and High School students Karo Regency Year 2015-2019

Year	The Number Of Elementary School Students And Their Level Whose Health Is Checked By Health Workers Or Trained Personnel	Number Of Elementary School Students And The Same Level In One Area Of Work In The Same Period	Primary And Secondary Student Health Screening (%)
2015	7.784	8.112	95,95
2016	7.728	8.119	95,18
2017	7.501	7.501	100
2018	6.969	6.969	100
2019	6.892	7.237	95,23

Karo Regency Regional Income

Local revenue is the right of local governments recognized as an addition to the value of net worth (Law No. 33 of 2004 on financial balance between the Central Government and local governments).

Regional revenues include all receipts of money through the Regional Public Treasury account, which adds to the current equity fund, which is the right of the region in one fiscal year that does not need to be paid back by the region (PP no. 58 of 2005 on Financial Management)

Karo Regency Regional Income Sources :

1. Karo Regency's original revenue, including local taxes, levies, the results of separated regional wealth management, and other legitimate original revenue, such as grants, emergency funds and other income in accordance with laws and regulations

2. Transfer income, including central government transfers consisting of balance funds, special autonomy funds, special privileges funds, and village funds; and inter-regional transfers consisting of revenue sharing and financial assistance;
3. Other legitimate local revenues, including regional revenues outside local taxes and levies, such as current account services and proceeds from the sale of regional assets.

Quoted from the book Macroeconomics Riau Islands written by Dr. Jontro Simanjuntak, S.Pt., S.E., M.Gross Regional Domestic Product (PDRB) is the amount of value-added goods and services generated from all economic activities throughout the region.

Table 12 PDRB Per Capita Karo Regency

Year	PDRB per capita Karo Regency On the basis of prices Konstant 2010
2010	26180000
2011	27080000
2012	27900000
2013	28700000
2014	30000000
2015	30500000
2016	31500000
2017	32500000
2018	33500000
2019	34600000
2020	34620000
2021	33560000

Source: BPS,Karo Regency

Table 13 Karo Regency Per Capita Real Expenditure

Year	Real expenditure per capita
2010	11173000
2011	11265000
2012	11359000
2013	11453000
2014	11548000
2015	11800000
2016	11925000
2017	12059000
2018	12367000
2019	12474000
2020	12349000
2021	12412000

Source: BPS, Karo Regency

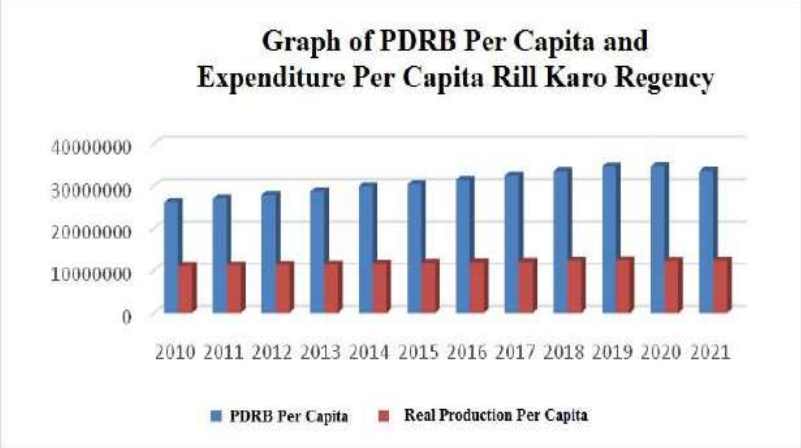


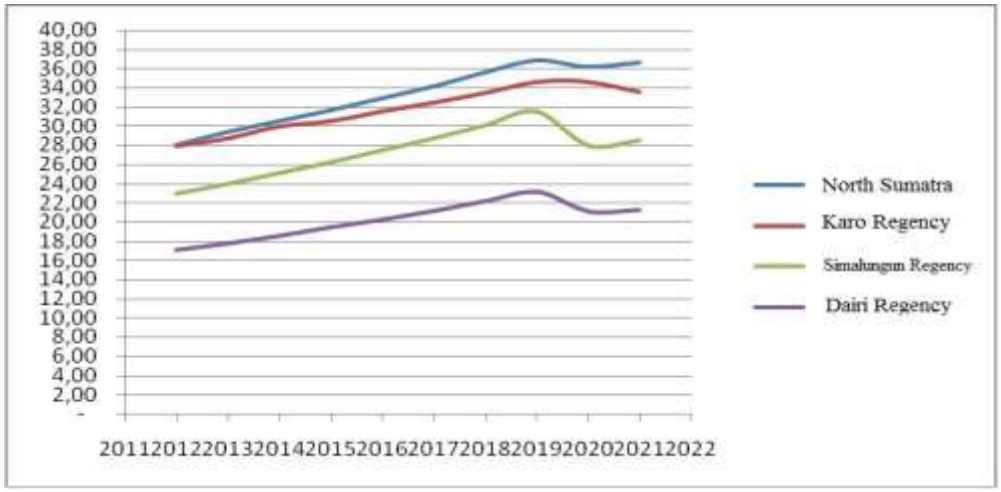
Figure 1 Graph of PDRB Per Capita and Expenditure Per Capita Rill Karo

Based on the data in the graph above, it can be concluded that the PDRB per capita of Karo regency is higher than the real expenditure per capita of Karo Regency

Table 14 PDRB Per Capita North Sumatra, Karo Regency, Simalungun Regency, Dairi Regency Year 2012 S/D 2021 (Units Of Millions Of Rupiah)

Year	North Sumatra	Karo Regency	Simalungun Regency	Dairi Regency
2012	28.04	27.9	22.97	17.03
2013	29.34	28.7	24.01	17.78
2014	30.48	30	25.11	18.57
2015	31.64	30.5	26.26	19.40
2016	32.89	31.5	27.51	20.27
2017	34.18	32.5	28.76	21.18
2018	35.57	33.5	30.10	22.13
2019	36.85	34.6	31.49	23.13
2020	36.18	34.62	28.02	21.14
2021	36.67	33.56	28.54	21.31

Source: BPS, North Sumatra, Karo Regency BPS



Source: Data Processing BPS North Sumatra, Karo Regency BPS

Figure 2 graph of PDRB per capita of North Sumatra, karo Regency, simalungun Regency, Dairi Regency in 2012 s/d 2021 (units of millions of rupiah)

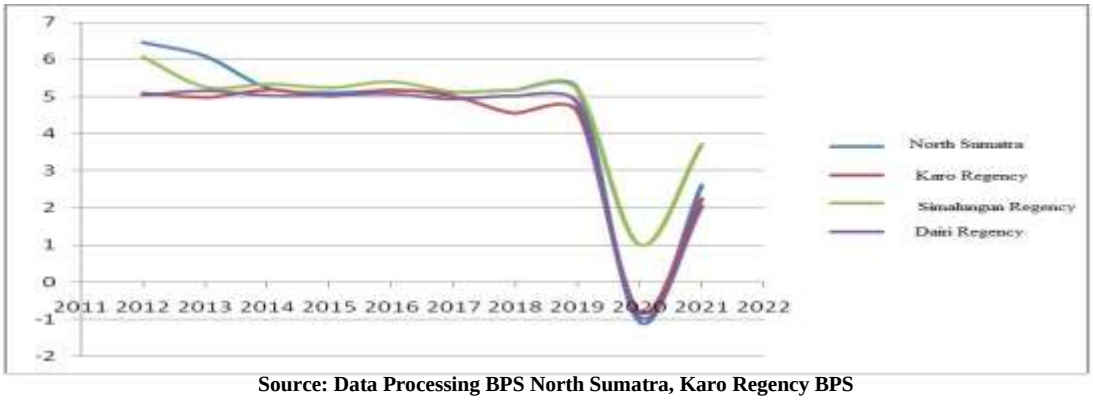
Karo regency, Simalungun Regency and Dairi Regency are three regencies located in mountainous and agricultural areas as the largest PDRB contributors.

Based on data obtained from BPS North Sumatra and BPS Karo regency can be seen that the PDRB per capita Karo regency is the highest PDRB per capita among the other two districts (Simalungun and Dairi), but still below the PDRB per capita of North Sumatra.

Table 15 Economic Growth North Sumatra, Karo Regency, Simalungun Regency, Dairi Regency Year 2012 S/D 2021

Year	North Sumatra (%)	Karo Regency (%)	Simalungun Regency (%)	Dairi Regency (%)
2012	6.45	5.09	6.06	5.03
2013	6.08	4.98	5.26	5.15
2014	5.23	5.18	5.33	5.03
2015	5.1	5.01	5.24	5.04
2016	5.18	5.18	5.4	5.07
2017	5.12	5.01	5.13	4.93
2018	5.18	4.55	5.18	5.01
2019	5.22	4.6	5.2	4.82
2020	-1.07	-0.8	1.01	-0.94
2021	2.61	2.25	3.7	2.05

Source: BPS, North Sumatra, Karo Regency BPS



Source: Data Processing BPS North Sumatra, Karo Regency BPS

Figure 3 graph of economic growth of North Sumatra, karo Regency, simalungun Regency, dairi Regency in 2012 s/d 2021 (unit percent)

Based on data obtained from BPS North Sumatra and BPS Karo regency can be seen that the economic growth of Simalungun regency is the highest economic growth among the other two districts (Karo and Dairi).

Karo Regency economic growth fluctuated, Karo Regency economic growth 2018 s.d 2020 is the lowest among the 3 regencies and also the province of North Sumatra (Karo Regency, Simalungun Regency, Dairi Regency). And the average economic growth of Karo regency is lower than the economic growth of North Sumatra province

From the above data there is a phenomenon, PDRB per capita Karo greater when compared with PDRB Simalungun, but the economic growth of Karo lower than Simalungun and also lower than the average economic growth of North Sumatra province.

PDRB per capita is obtained from PDRB / population.

PDRB obtained from the distribution of business field :

1. Agriculture, Forestry and Fisheries
2. Mining and quarrying
3. Processing Industry
4. Electricity and Gas procurement
5. Water supply, Waste Management, Waste and recycling
6. Construction
7. Wholesale and Retail Trade, car and motorcycle repair
8. Transportation and warehousing
9. Provision of accommodation and food and drink
10. Information and communication
11. Financial and Insurance Services
12. Real Estate
13. Company Services
14. Government administration, Defense and compulsory Social Security
15. Education Services
16. Health services and social activities
17. Other Services

Of the three regencies (Simalungun Regency, Karo Regency, Dairi Regency), Karo regency is the highest Regency average contribution of PDRB according to the field of Agriculture to PDRB based on the field of business that is equal to 56%. This is a phenomenon that must be investigated. Whether the PDRB according to the field of Agriculture has a positive effect on regional income (PDRB per capita).Because if it does not affect it must be sought to further maximize the PDRB according to the agricultural business field or seek to maximize PDRB according to the field of business outside agriculture.

From the above we can know that the natural resources of karo regency have potential in prekonomian karo Regency.We can also know this based on statistical data from the Central Bureau of Statistics of karo Regency, which is the largest contributor to PDRB based on the business field is Agriculture, Forestry and Fisheries. And it is expected that the increasing economic conditions karo Regency will also increase the regional income of Karo Regency.

Which means the increasing management of Natural Resources Potential (Agriculture, Forestry and Fisheries) is also increasing the level of regional income Karo. In this study as a measure of local income is PDRB per capita. It is expected that the increasing management of natural resource potential of Agriculture, Forestry and Fisheries will also increase PDRB per capita .

Similarly with human resources, to be able to manage the potential of Natural Resources and other economic resources available, it requires potential human resources. It is expected that the better the potential of human resources, the more able to manage natural resources and other economic resources, and further increasing the potential of human resources, the increasing regional income (PDRB per capita)

In this study the potential of human resources is measured through the level of Public Health. The level of Health is seen based on BPS data on PDRB based on the health business field.

The higher the PDRB based on the health business field means that more people need health services, the more people need health services, the reduced potential to manage economic resources, which means the decrease in regional income (PDRB per capita).

LITERATURE REVIEW

Regional Income

Autonomy policy in the early 2000s, a new chapter in local government. With that authority, autonomous regions regulate and manage their regions in a broad, real and responsible manner. With this policy, local governments are racing to optimize the potential of existing resources and create policies to increase regional income (PAD).Local governments are given the authority to manage natural resources, artificial resources, and human resources in their respective regions. In order to create sustainable development, mining business activities are carried out with due regard to environmental principles, transparency, and community participation. To achieve the greatest economic and social benefits for the welfare of the people of Indonesia environment, transparency, and community participation. To achieve the greatest economic and social benefits for the welfare of the people of Indonesia (Ledyawati, 2017).

Gross Regional Domestic Product (PDRB) on the basis of market prices

Gross Regional Domestic Product on the basis of market prices is the sum of gross value added arising from all sectors of the economy in a region. Added value is the value added from the combination of production factors and raw materials in the production process. The calculation of value added is the value of production (output) minus intermediate costs. Gross value added here includes the components of factor income (wages and salaries, interest, land rent and profits), depreciation and net indirect taxes. So by summing the gross added value of each sector and summing the gross added value of all sectors, the Gross Regional Domestic Product will be obtained on the basis of market prices.

Net Regional Domestic Product (PDRB) on the basis of market prices

The difference between the net concept here and the gross concept above, is because in the gross concept above; depreciation is still included in it, while in this net concept the depreciation component has been excluded. So the Gross Regional Domestic Product on the basis of market prices minus depreciation will be obtained net Regional Domestic Product on the basis of market prices. The depreciation referred to here is the depreciation value (Aus) of capital goods that occurs during the capital goods participate in the production process. If the depreciation values of capital goods from all sectors of the economy are summed up, then the result is the depreciation referred to above.

PDRB on the basis of prevailing prices

PDRB on the basis of prevailing prices describes the value added of goods and services calculated using the prices in the current year, while PDRB on the basis of constant prices shows the value added of goods and services calculated using the prices prevailing in a particular year as the base year. PDRB according to applicable prices used to determine the ability of economic resources, shifts, and economic structure of a region. Constant PDRB is used to determine real economic growth from year to year or economic growth that is not influenced by price factors. PDRB can also be used to determine price changes by calculating the PDRB efflator (implicit index change). The implicit price index is the ratio between PDRB at current prices and PDRB at constant prices.

Natural Resources

Natural resources are everything that is under or above the Earth including the land itself, which means something that is still inside or outside the Earth and its nature is still potential and has not been involved in the production process to increase the availability of goods and services in the economy. Resource goods are natural resources that have been taken from within or on the Earth and are ready to be used and combined with other factors of production so that new outputs can be produced in the form of goods and services for consumers and producers. A natural resource is something that exists in nature that is useful and contains value in the conditions in which we find it.a thing is said to be a natural resource when it meets three conditions: (i) it exists; (ii) it can be taken; and (iii) it is useful.

Human Resources

Human resources is the integrated ability of thought and physical power possessed by individuals. His behavior and traits are determined by his heredity and environment, while his work performance is motivated by the desire to meet his satisfaction, while his work performance is motivated by the desire to meet his satisfaction. The quality of human resources must be improved so that work productivity increases, so that a prosperous life is achieved. Prosperous life is defined as relatively able to meet their needs and feel safe in enjoying it. Thinking power is intelligence that is born (authorized capital) while skill is obtained from effort (learning and training). Intelligence is the measure of intelligence quotient (IQ).

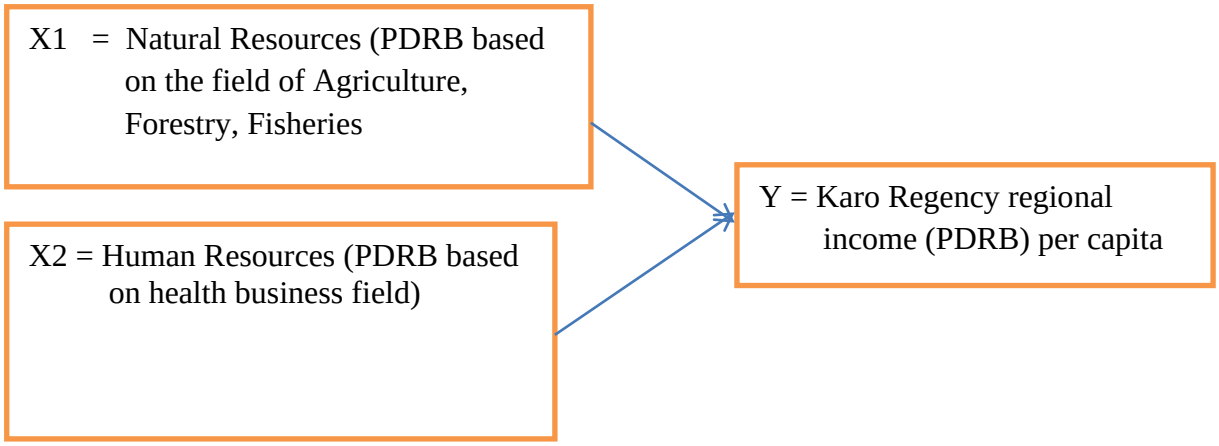


Figure 6. Conceptual Framework

Hypothesis

Based on background research and the relationship between variables, the research hypothesis:

1. There is a positive influence of natural resources (agricultural land, forests, fisheries) on the income of Karo Regency.

2. There is a positive influence of human resources (health) on the regional income of Karo Regency, meaning that the better the public health, the increasing regional income. The higher the PDRB based on the health business field, the more people use health services, which means that when more people need health services, the lower the level of Public Health, the hypothesis is taken that the higher the PDRB based on the health business field, the lower the regional income.

MATERIAL AND METHODS

The scope of this study is in Karo regency by analyzing the potential of Natural Resources (PDRB based on the field of Agriculture, Forestry, Fisheries) and the potential of Natural Resources (PDRB based on the field of Health business to Karo Regency regional income (PDRB per capita) by taking data from 2007 to 2021 which is interpolated with semester data.

The type of research used in this study is quantitative research, which examines the population of Karo regency on the potential of Natural Resources (PDRB based on the field of Agriculture, Forestry, Fisheries) and the potential of Human Resources (PDRB based on the field of Health) to Karo Regency regional income (PDRB per capita), using measuring instruments or research instruments.

Population is the entire object of research consisting of humans, animals, objects, growth, events, symptoms, or test scores as a source of data that has certain characteristics in a study conducted. So the population in this study is the Natural Resources (PDRB based on the field of Agriculture, Forestry, Fisheries) in Karo Regency and Human Resources (PDRB based on the field of Health) Karo Regency.

This study uses secondary data in the form of time series data that is data collected over a period of 15 years and interpolated into semester data. Sources of research data obtained from reports that have been published by the district government. Karo at the Central Statistics Agency. The following details of the data used in this study: 1. Karo Regency's natural resource potential (PDRB based on agricultural, forestry, fisheries business Fields) was obtained from BPS Karo Regency data from 2007 to 2021. 2. The potential of Human Resources (PDRB based on the health business field) of Karo regency was obtained from BPS Karo Regency data from 2007 to 2021. 3. Regional income (PDRB per capita) of Karo regency was obtained from BPS Karo Regency data from 2007 to 2021.

RESULTS

Data Analysis

Based on per capita PDRB data of Karo regency in 2007 s/d 2021 and PDRB according to the Karo Regency business field in 2007 s / d 2021, the data analysis is multiple linear regression data analysis with 15-year time series data interpolated into semester data and processed using eviews 10.

In the analysis taken 2variabel independent data, namely PDRB on the basis of prevailing prices according to the field of business (Million Rupiah):

1. Agriculture + Forestry + Fishing (X1)
2. Health (X2)

And one dependent variable, namely: PDRB per capita Karo regency in 2007 S/D 2022 (Y) Dependent variable Data (Y) and independent variable data (X1, X1) can be seen in the following table :

Table 16 Data dependent variable (y) and Independent (X1 and X2)

Year	y	X1	X2
2007S1	6,400,000	1,297,808.12	11,748.18
2007S2	6,600,000	1,383,382.00	12,620.82
2008S1	6,900,000	1,468,956.00	13,489.44
2008S2	7,100,000	1,554,530.00	14,358.07
2009S1	7,500,000	1,658,129.00	15,021.91

Table 16 To Be Continued…			
2009S2	7,700,000	1,755,720.00	15,754.01
2010S1	12,990,000	2,710,705.00	35,096.25
2010S2	13,210,000	2,862,225.00	39,273.75
2011S1	13,430,000	3,013,745.00	43,451.25
2011S2	13,650,000	3,165,265.00	47,628.75
2012S1	13,850,000	3,246,405.00	51,075.00
2012S2	14,050,000	3,351,005.00	54,765.00
2013S1	14,250,000	3,587,283.00	59,797.51
2013S2	14,450,000	3,779,668.00	64,382.51
2014S1	14,840,000	3,843,611.00	72,376.25
2014S2	15,160,000	3,950,368.00	79,233.75
2015S1	15,190,000	4,159,089.00	88,547.51
2015S2	15,310,000	4,333,821.00	97,042.51
2016S1	15,370,000	4,514,644.00	195,904.60
2016S2	15,380,000	4,693,436.00	196,115.70
2017S1	16,120,000	4,873,230.00	206,723.81
2017S2	16,380,000	5,052,690.00	206,646.19
2018S1	16,620,000	5,144,974.00	224,463.60
2018S2	16,880,000	5,266,316.00	224,476.40
2019S1	17,170,000	5,413,211.00	250,178.72
2019S2	17,430,000	5,551,589.00	250,191.28
2020S1	17,590,000	5,596,306.00	277,811.00
2020S2	17,010,000	5,672,244.00	222,649.00
2021S1	16,810,000	5,825,978.75	279,426.00
2021S2	16,750,000	5,953,781.25	279,123.00

Source: BPS Karo Regency, data processed

Description:

The data is Semester 2007 s/d 2021 data
Y = PDRB per capita
X1 = PDRB based on field agriculture+ forestry + fisheries (million rupiah)
X2= PDRB based on health business field (million rupiah)

Dependent Variable: Y
Method: Least Squares
Date: 10/23/22 Time: 22:29
Sample: 2007S1 2021S2
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1956934.	570532.8	3.430012	0.0020
X1	3.885588	0.249800	15.55477	0.0000
X5	-25.40872	3.778513	-6.724529	0.0000

R-squared	0.962681	Mean dependent var	13736333
Adjusted R-squared	0.959917	S.D. dependent var	3649652.
S.E. of regression	730685.9	Akaike info criterion	29.93599
Sum squared resid	1.44E+13	Schwarz criterion	30.07611
Log likelihood	-446.0399	Hannan-Quinn criter.	29.98082
F-statistic	348.2508	Durbin-Watson stat	1.154394
Prob(F-statistic)	0.000000		

Figure 4 Results of regression analysis using Eviews 10

Classic Assumption Test

Normality Test

To determine the distribution of data, whether the distribution of data is normal or not, then the normality test is done.

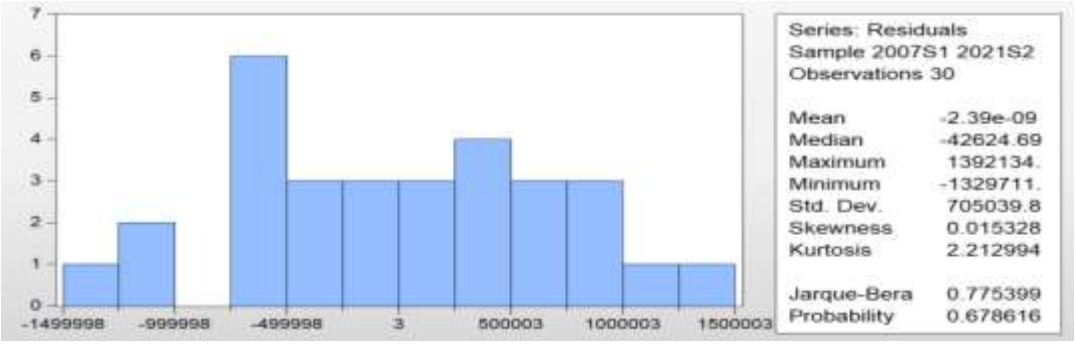


Figure 5 Normality Test Results

In the normality test results obtained Probability 0.678616 which means the value of Probability > 0.05 then concluded the Normal distribution of data.

Multicollinearity Test

To test the test whether the model regresiditemukan correlation between independent variables then do the multicollinearity test

Variance Inflation Factors
Date: 10/23/22 Time: 22:35
Sample: 2007S1 2021S2
Included observations: 30

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	3.26E+11	18.29030	NA
X1	0.062400	58.77997	7.543439
X5	14.27716	19.28489	7.543439

Figure 6 Multicollinearity Test Results

In multicollinearity Test obtained the value of Variance Inflation Factor for X1 and X2 is smaller than 10, it can be concluded there is no multicollinearity in the independent variable.

Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.805498	Prob. F(2,25)	0.0796
Obs*R-squared	5.499000	Prob. Chi-Square(2)	0.0640

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 10/23/22 Time: 22:33
Sample: 2007S1 2021S2
Included observations: 30
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	332902.6	554739.8	0.600106	0.5538
X1	-0.168578	0.245502	-0.686686	0.4986
X5	2.348544	3.685986	0.637155	0.5298
RESID(-1)	0.387735	0.208511	1.859545	0.0748
RESID(-2)	0.174598	0.211644	0.824960	0.4172

R-squared	0.183300	Mean dependent var	-2.39E-09
Adjusted R-squared	0.052628	S.D. dependent var	705039.8
S.E. of regression	686236.6	Akaike info criterion	29.86684
Sum squared resid	1.18E+13	Schwarz criterion	30.10038
Log likelihood	-443.0027	Hannan-Quinn criter.	29.94155
F-statistic	1.402749	Durbin-Watson stat	1.814795
Prob(F-statistic)	0.261904		

In autocorrelation Test obtained the value of Prob. Chi-Square > 0.05, it can be concluded there is no autocorrelation

Interpretation Of Regression Analysis Results

Dependent Variable: Y
Method: Least Squares
Date: 10/23/22 Time: 22:29
Sample: 2007S1 2021S2
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1956934.	570532.8	3.430012	0.0020
X1	3.885588	0.249800	15.55477	0.0000
X5	-25.40872	3.778513	-6.724529	0.0000

R-squared	0.962681	Mean dependent var	13736333
Adjusted R-squared	0.959917	S.D. dependent var	3649652.
S.E. of regression	730685.9	Akaike info criterion	29.93599
Sum squared resid	1.44E+13	Schwarz criterion	30.07611
Log likelihood	-446.0399	Hannan-Quinn criter.	29.98082
F-statistic	348.2508	Durbin-Watson stat	1.154394
Prob(F-statistic)	0.000000		

From the results of multiple regression analysis using eviews 10 obtained :
The regression Model is :
Y = 1956934 + 3, 885588X1 -25, 40872X5

Simultaneous Test (F Test)

- this test aims to determine the effect of independent variables together (simultaneous) to the dependent variable
- in the above output, obtained Prob (F-statistic) or p-value is less than 0.1
- The decision taken is reject H0. So it can be concluded there is at least one significant independent variable and affect the dependent variable.

Partial Test (t test)

- t test aims to determine the effect of each independent variable on the dependent variable
- The value of p value X1 is 0.0000 where p value X1 < 0.05 so that it receives H1, meaning that x1 (PDRB based on agriculture + forestry + fisheries) affects Y (PDRB per capita)
- The value of p value X5 is 0.0000 where p value X5 < 0.05 so that it receives H1, meaning that X5 (PDRB based on education business field) affects Y (PDRB per capita)

Coefficient Of Determination

Based on the above output, obtained coefficient of determination of 0.942969 this shows that the dependent variable (PDRB per capita) in the model can be explained by 94% by the independent variable (PDRB based on field agriculture + forestry+fisheries and PDRB based on lapngan health business while the remaining 6% is influenced by other variables outside the model.

Beta Coefficient

- Beta coefficient value X1 is 3.885588 which means X1 can affect Y of 3.885588 units or can be interpreted: any increase in PDRB according to the field of agriculture + forestry + fishery Rp. in Karo district may result in increased changes in .000,000, will increase per capita income of Rp. 3.89 semester.
- The beta coefficient value of X2 is -25.40872 which means X1 can affect Y by -25.40872 units, or it can be interpreted: every increase in health sector revenue of Rp. 1,000,000 will reduce per capita income of Rp. 25.41 semester.

DISCUSSION

The Potential Of Natural Resources to Local Revenue Karo

The potential of Natural Resources in this study is an independent variable that affects the dependent variable of regional income. To determine the effect of Natural Resource Potential on regional income (PDRB per capita), then take the PDRB data based on agricultural business field Karo, namely data from the District BPS. Karo in 2017 s/d 2021 and Karo Regency PDRB per capita data in 2017 s / d 2021 .

From the analysis of the data obtained, there is a positive relationship between the potential of Natural Resources (PDRB according to the field of Agriculture + Forestry + Fisheries) in Karo regency with regional income (PDRB per capita).And obtained results of each change of one million rupiah per semester of Natural Resource Potential (PDRB according to the field of Agriculture + Forestry + Fisheries) in Karo Regency can result in changes in regional income (PDRB per capita) of Rp. 3,885588.

Based on the theory, Natural Resources have a positive effect on local income. Research results in accordance with the theory. Based on the results of the study, Natural Resources Agriculture + Forestry + Fisheries is the largest contributor to PDRB Karo, and has the highest PDRB per capita among the mountainous areas of natural resource potential is the same, but the economic growth Karo last 10 years below the average economic growth of North Sumatra, even below the average economic growth of other regions (areas with the same

natural resource potential as Karo), related to the results of this study, Karo Regency should maximize the potential management of Natural Resources (Agriculture, Forestry and Fisheries), if it is maximal, Karo Regency should dig up other economic resources, so that Karo Regency's economic growth can increase.

The Potential Of Natural Resources to Local Revenue Karo

The potential of Human Resources in this study is an independent variable that affects the dependent variable of regional income. To determine the effect of Human Resource Potential on regional income, then take the PDRB data based on the Karo district health business field, namely data from the District BPS, Karo year 2017 s / D 2021.

From the results of the data analysis obtained, there is a negative relationship between the potential of Human Resources (PDRB according to the field of Health) in Karo regency with regional income (PDRB per capita). And obtained results of each change of one million rupiah per semester of Natural Resource Potential (PDRB according to the field of Agriculture + Forestry + Fisheries) in Karo Regency can result in changes in regional income (PDRB per capita) of Rp. 25. Based on the theory, the cost of Health is an investment in human resources, based on the results of this study, researchers concluded that PDRB based on health business field in Karo regency, is an investment from the community and government for Human Resources in Karo Regency and the results have not been obtained positively to regional income (PDRB per capita) in the short term, so that the potential of Human Resources (PDRB based on health business field) negatively affect regional income.

Based on the theory, the level of Health has a positive impact on productivity, which certainly has a positive impact on income.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Based on the results of the study it can conclude as follows:

1. Natural Resources (PDRB on the basis of prevailing prices according to the field of Agriculture + Forestry + Fisheries) Karo regency significant effect on per capita income Karo.
2. Human resources (PDRB on the basis of prevailing prices according to the health business field) Karo regency significant effect on per capita income Karo Regency.

RECOMMENDATIONS

Suggestions researchers from research that has been done are as follows:

1. Karo Regency government is trying as much as possible how to increase PDRB on the basis of prevailing prices according to the field of Agriculture + Forestry + Fisheries.
2. The Karo Regency government is trying as much as possible how to make the people of Karo regency reduce costs for health.
3. Exploring the potential of other natural resources such as tourism, considering the natural conditions of karo regency which has the potential as a tourist spot both for regional, national and international, because the economic growth of Karo regency in the last 10 years is below the average economic growth of North Sumatra province.
4. Strive to improve the competence/quality of human resources, because the better the competence/quality of human resources, the management of Natural Resources will be maximized, and the level of Health will also be better.

Declaration by Authors

Acknowledgement: None

Source of Funding: None

Conflict of Interest: The authors declare no conflict of interest.

REFERENCE

1. Arman Drake, 2010. *Kebijakan pengelolaan lingkungan hidup barbasis ekonomi sumberdaya*.Universitas Muhammadiyah Maluku Utara, Ternate, Indonesia.
2. Widowati, Dyah A Dkk, *Hak Penguasaan Atas Sumber Daya Alam Dalam Konsepsi Dan Penjabarannya Dalam Peraturan Perundang-Undangan*, 2019. Fakultas Hukum Universitas Gadjah Mada.
3. Farley, J. 2012. Natural Capital Beskshire Publishing. http://www.berkshirepublishing.com
4. Fauzi, Ahkmad. 2004. *Ekonomi Sumberdaya Alam dan Lingkungan: Teori dan Aplikasi*. PT Gramedia Pustaka Utama. Jakarta. 2004.
5. Hidayat, Luthfi. 2017. *Pengelolaan Lingkungan Areal Tambang Batubara (*Studi Kasus Pengelolaan Air Asam Tambang (Acid Mining Drainage) di PT. Bhumi Rantau Energi Kabupaten Tapin Kalimantan Selatan). SuKabupatenumi: Universitas Muhammadiyah SuKabupatenumi.
6. Istiyanti . 2018. *Solusi Model Perikatan Pengelolaan SDA Pertambangan Mineral Dan Batubara Sesuai Syariah.*
7. Ledyawati, 2017.*Kewenangan Pemerintah Daerah Dalam Pengelolaan Sumber Daya Alam Pertambangan Mineral Di Era Otonomi Daerah*, Jurnal Agregasi Vol 5 No 1 (2017) Publish Date 15 May 2017 Universitas Muhammadiyah Bengkulu .
8. M. Suparmoko. 2008. *Ekonomi Sumber Daya Alam dan Lingkungan*. BPEE – Yogyakarta.
9. PP No. 58 tahun 2005 tentang *Pengelolaan Keuangan.*
10. PP RI Nomor 122 Tahun 2015 Tentang *Sistem Penyediaan Air Minum (SPAM).*
11. Undang-Undang No. 33 tahun 2004 tentang *perimbangan keuangan antara pusat dan daerah pasal 6*
12. Peraturan Menteri Dalam Negeri Nomor 13 Tahun 2006
13. UU No 33 tahun 2004 tentang *Perimbangan Keuangan antara Pemerintah Pusat dan Pemerintahan Daerah.*
14. Undang-Undang No 41 Tahun 1999 tentang Kehutanan.
15. https://www.kompasiana.com/nidaauliahanifa5660/6210fe1951d764592c0ede42/pemanfaatan-sumber-daya-alam-berdasarkan-peraturan-pengelolaan-lingkungan?page=all&page_images=1
16. Bloom, D. E., Canning, D., & Sevilla, J. (2004). Theeffect of health on economic growth:Aproduction function approach. WorldDevelopment, 32(1), 1≤13. http://doi.org/10.1016/j.worlddev.2003.07.002

How to cite this article: Rosti Br Perangin Angin, Rujiman, Rahmanta. Analysis of the potential of natural resources and human resources to the regional income of karo regency. *International Journal of Research and Review*. 2023; 10(4): 273-291.
DOI: *https://doi.org/10.52403/ijrr.20230434*

******