Brazil, Preservation of Forest and Biodiversity

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AND BIODIVERSITY

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Summary:

Increased number of extinct, endangered species in South America, especially plants in Brazil and Equator, impose question of importance of Amazon forest. Its declining trend requires constant attention not just from population in Brazil, but as well as in region and world which have their interest in direct/ indirect monetary and non-monetary values. GDP decline can further deteriorate forest areas so it is of importance to diversify and strengthen energy inputs and work on different renewable strategies.

Many projects are possible but all should rely on social justice, protecting women, low income groups by strategies of small loans, agriculture land given to small groups, guaranteed market, and help through education. Paper proposes projects of algae, new approach in tourism, and solar transport opportunities.

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1. INTRODUCTION

Countries of BRIC region among them Brazil have shown, as many other parts of the world, signs of slow down after 2008 crises that started in USA. The recover has been slowed down bringing stagnation after period of strong rise. Still notion is clear Brasil was and still is a hope of new successful economies on the world horizon.

The task of the paper is to examine significance of the country in terms of natural resources and potential relation between GDP growth and forest preservation. Strong and vivid movements in GDP rise can mean rising social natural awareness, preserving natural richness but can also come from overexploitation of natural resources.

Keeping nature and life in its variety of forms in not just the mater of legal and natural protection rights but a world matter that can further promote country natural resource, increase tourism potentials, promote cooperation in industry, culture and other sectors between Brazil and other world countries. Although Brazil has moved away from influences of fluctuation in oil price in a way to use large arable land for sugar cane production and using it as input in flux fuel vehicles, there is still large potential in using different kind of renewables inputs, using wind, solar, bio resources as hedge against hydro fluctuations.

Literature of Brazil is waste and rich and concern rises globally. Just to mention: forest organisations, many research centers, and numerous papers that are related to subject:

Adepau:Economic Valuation of Non Timber Forest Product; Apostol: Rural waste management; Bacheu: Environmental Management in Agriculture; Barna:Re thinking on the role of business in biodiversity Conservation; Beord ,Rodeney: Reconciling resource economics and ecological economics; Gul :Socio Economic Context of Saving Biodiversity; Haloes, George: Modeling biodiversity ;Halkos: Ecosystem Services; Polasky:Conserving biodiversity by Conserving Land; Sing.Sustainable Agriculture; Spaash:Willife Conservation; Andre Luiz; CO_2 *e crescimento economics o trinomio economia,energia e meio ambiente; Anefa Joaguin :Estrutura do mercado Brasilero de flores e plants ornamentas, Brito: Diagnostico do Crescimento da Ecopnomia Cabo verdiana; Costa Jose Martin- Importancia de una politica rural; Impactos da agricultura de preciso un econommic Brazilera. etc.*

2. BIODIVERSITY

Economy is such social scientific activity that in its body incorporates all other natural and social studies, more and more relies on prediction and reverses to basic human activities as the environmental concerns throughout world increases. Production activities are not just related to efficiency in human labor, mechanics and strong market demand, supply foreces but also need to incorporate weather forecast, activities from sudden weather change, and need to take special attention to harmful consequences of human activities that are mostly measured in CO_2 increase, ozone reduction, drought, flooding that further impacts economies.

After this basics are took in frame some countries more than others jumps into frame as a school case for different human/nature activities: such is the way with Brazil. These countries advances in its economic position, have stronger international presents, make trade relation over the world and overcome some deficiencies in natural resources with other types of production: oil is substituted with ethanol from sugar beets. Also this activity is by far and large seen as positive, where E20-25-50 increase of ethanol blended in classical gasoline is present on market, some negative consequences such as deforestation occurred. In this respect paper tries to impose question of right measure between economic developments, environmental conservation, question of environmental biodiversity potential as a wealth that is or not related to country itself, but to region and world s whole.

Certainly is a huge advance for Brazil to still enjoy marvels of nature in the form of large number of species just to mention a few: plants (55.000), freshwater fish (3000), Mammals (684); large number of birds (1837), reptiles (744), large and diversified number of fungi. Around 1/10 of world species found its home in Brazilian Amazon Rainforest, high number of vertebrates and invertebrates it is an interesting fact that some new species are discovered each day.

Also very diverse surrounding points to natural treasure rarely seen in the world, and these diversity further directs toward need to establish strategy between economic and natural surroundings: *Amazon Rainforest, Atlantic Forest, Tropical Savanna, Xeric Shrub lands, the largest wetland area* - where a variation of life forms took a full strength. This area of the world is a home to manned wok, bush dog, different fox families, monkey, capybara, jaguar, puma, deer, Ocilla, jaguarondi, amaryllis, Besides 1107 species of mollusk there are around 70 000 species of insects , and with neighboring regions of Peru and Columbia it is a place with large variety of bird life (1622 species), parrots (70), toucan, flamingo, ducks, hawks, eagles, owls, hummingbirds as well a 3000 species of fresh fish.

Concerning fact is that there is a longer and longer list of species that are recognized as engendered among them are: orchids, costacea, lauraceae, moraceae etc. in all parts of Brazil. Many plants that inhabited Earth are not even cataloged and many are still unknown to population (last geological era) and these families that are currently in Brazil especially in Amazon region need special and equipped teams of researcher to explore and protect. Plants situated near inhabited areas can be recognized by authorities and specially protected.

Table1: Endangered Species Brazil

Number	Vulnerable flora	Families	Geographic distribution
1.	Anacardiaceae		
		Astronium fraxinifolium	Bahia, Ceará, Espírito Santo, Goiás, Mato Grosso, Maranhão, Minas Gerais, Piauí, and Rio Grande do Norte.
		Astronium urundeuvau	Bahia, Ceará, Espírito Santo, Goiás, Mato Grosso, Maranhão, Minas Gerais, Piauí, and Rio Grande do Norte.
2.	Araucariaceae		
		Araucaria angusifolia	Minas Gerais, Paraná, Rio Grande do Sul, Santa Catarina, and São Paulo
3.	Asclepiadaceae		
		Ditassa arianeae	
		Ditassa maricaensis	
4.	Asteraceae		
		Aspilia grazielae	Mato Grosso do Sul
		Aspilia paraensis	Pará
		Asphilia pohlii Backer	Rio Grande do Norte
		Asphilia procumens Backer	Rio Grande do Norte
5.	Bromeliacae		
		Aechmea apocalyptica Reitz	Paraná, Santa Catarina, and São Paulo
		Aechmea blumenavii Reitz - Category: Critically Endangered (CR)	Santa Catarina
		Aechmea kleinii Reitz - Category: Critically Endangered (CR)	Santa Catarina
		Aechmea pimenti-velosii Reitz - Category: Critically Endangered (CR)	Santa Catarina
		Billbergia alfonsi-joannis Reitz - Category: Endangered (EN)	Espírito Santo and Santa Catarina
6.	Caesalpinioideae		

		Bauhinia smilacina Steud. - Category: Vulnerable (VU)	Bahia and Rio de Janeiro
		Caesalpinia echinata Lam. - Category: Endangered (EN)	Bahia, Pernambuco, Rio Grande do Norte and Rio de Janeiro
7.	Chrysobalanaceae		
		Couepia schottii Fritsch	
8.	Costaceae		
		Costus cuspidatus (Nees & Mart.) Maas	
		Costus fragilis Maas	
		Costus fusiformis Maas	
9.	Dicksoniaceae		
		Dicksonia sellowiana Hook.	
10.	Faboideae		
		Bowdichia nitida Spruce ex Benth. (spelled *Bowdickia nitida* in the bill) - Category: Vulnerable (VU)	Amazonas, Pará and Rondônia.
		Dalbergia nigra (Vell.) Allemão ex Benth. - Category: Vulnerable (VU)	Bahia and Espírito Santo
11.	Lauraceae		
		Aniba roseodora Ducke - Category: Endangered (EN)	Amazonas, Pará
		Dicypellium caryophyllatum Nees - Category:	
12.	Lecythidaceae		
		Bertholletia excelsa Humb. & Bonpl. - Category: Vulnerable (VU)	Acre, Amazonas, Maranhão, Pará and Rondônia.
		Cariniana ianeirensis Kunth	
13.	Moraceae		
		Brosimum glaucum Taub.	
		Brosimum glaziovii Taub.	
		Dorstenia arifolioa Lam. - Category: Vulnerable (VU)	Espírito Santo, Minas Gerais, Rio de Janeiro, and São Paulo
		Dorstenia cayapia - Category: Endangered (EN)	Bahia, Espírito Santo, Minas Gerais, Rio de Janeiro, and São Paulo
		Dorstenia ficus - Category: Critically Endangered (CR)	Rio de Janeiro
		Dorstenia fischeri - Category: Endangered (EN)	Rio de Janeiro
		Dorstenia ramosa - Category: Vulnerable (VU)	Rio de Janeiro

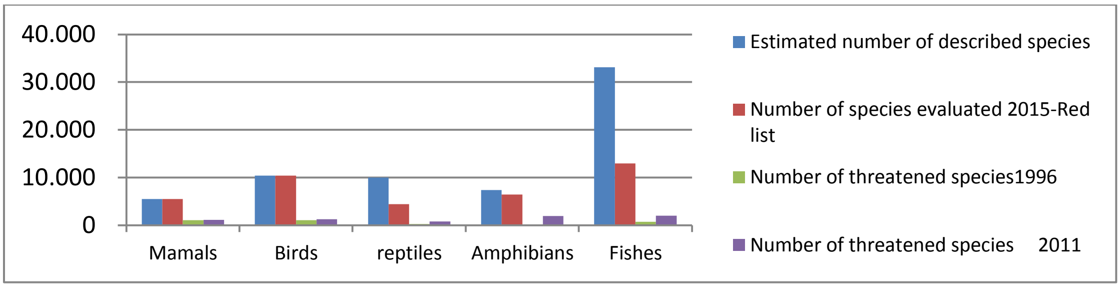
		Dorstenia tenuis - Category: Vulnerable (VU)	Paraná and Santa Catarina
14.	Orchidaceae		
		Cattleya schilleriana Rchb.f.	
15.	Sapotaceae		
		Bumelia obtusifolia Roem. & Schult. var. *excelsa* (DC) Mig.	

Source:Wikipedia.org

Since now scientist managed to recognized not just large number of species in each family of vertebrates, but make a trend of threatened species. Unfortunately situation comparing 2011/1996 is much worse for Amphibian when in 2011 tehre were 1.917 threatened species compared to 124 in 1996; fishes 2 028 in 2011 compared to 734 in 1996; and if look at 1996 when 3.314species were in danger (total of mammals, birds, reptiles, amphibians, fishes) in 2011 ,only few years later ,this number almost doubled to 7.113 .

Table 2: Vertebrates

	Estimated number of described species	Number of species evaluated 2015-Red list	Number of threatened species 1996	Number of threatened species 2011
Mammals	5.515	5.515	1.096	1.138
Birds	10.425	10.425	1.107	1.258
Reptiles	10.038	4.422	253	772
Amphibians	7.391	6.424	124	1.917
Fishes	33.100	12.941	734	2.028
	66.469	**39.727**	**3.314**	**7.113**

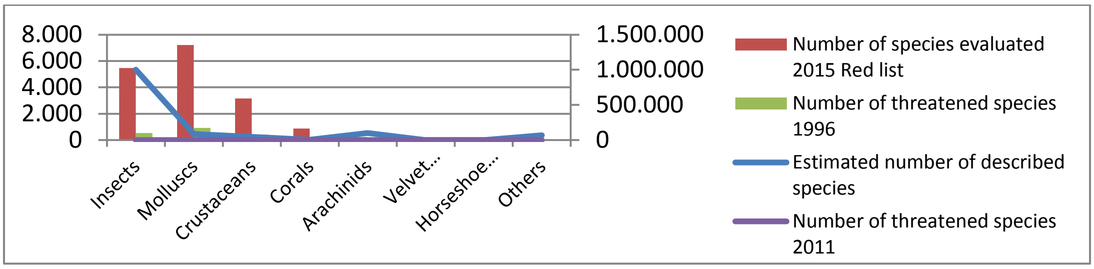


Picture 1

From 1,3 mil species of invertebrates (insects, mollusks, crustaceans, corals, arachnids, velvet worms, horseshoe crabs, other) number of threatened species in 1996 was 1.891 , in 2011 3.297 , and those red listed in 2015 were 17.408.

Table 3: Invertebrates

	Estimated number of described species	Number of species evaluated 2015 Red list	Number of threatened species 1996	Number of threatened species 2011
Insects	1.000.000	5.469	537	741
Molluscs	85.000	7.213	920	1673
Crustaceans	47.000	3.167	407	596
Corals	2.175	862	1	235
Arachinids	102.248	210	11	19
Velvet Worms	165	11	6	9
Horseshoe Crabs	4	4	0	0
Others	68.658	472	9	24
	1.305.250	17.408	1.891	3.297

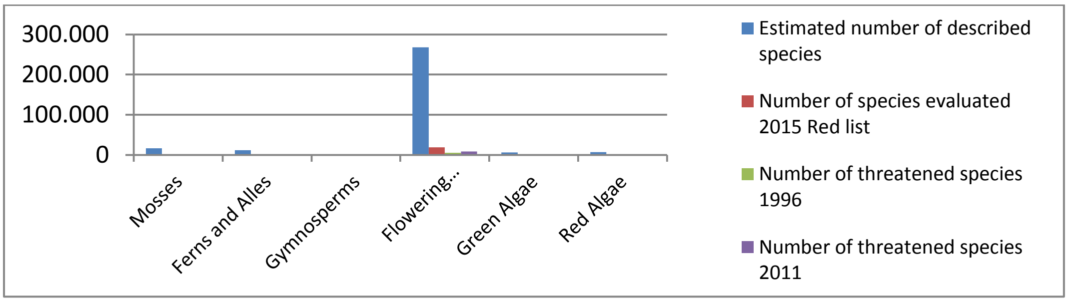


Picture 2

Further frightened fact is observed by scientist in family of algae, mosses. From totally recognized 310 the species, in 1996 threatened were 5.328 , in 2011 9.156 while last year brought further significant worsening of situation putting 20.185 species on red list.

Table 4: Algae

	Estimated number of described species	Number of species evaluated 2015 Red list	Number of threatened species 1996	Number of threatened species 2011
Mosses	16.236	102		80
Ferns and Alles	12.000	361		163
Gymnosperms	1.052	1.010	142	377
Flowering Plants	268.000	18.641	5.186	8.527
Green Algae	6.050	13	0	0
Red Algae	7.104	58		9
	310.442	20.185	5.328	9.156

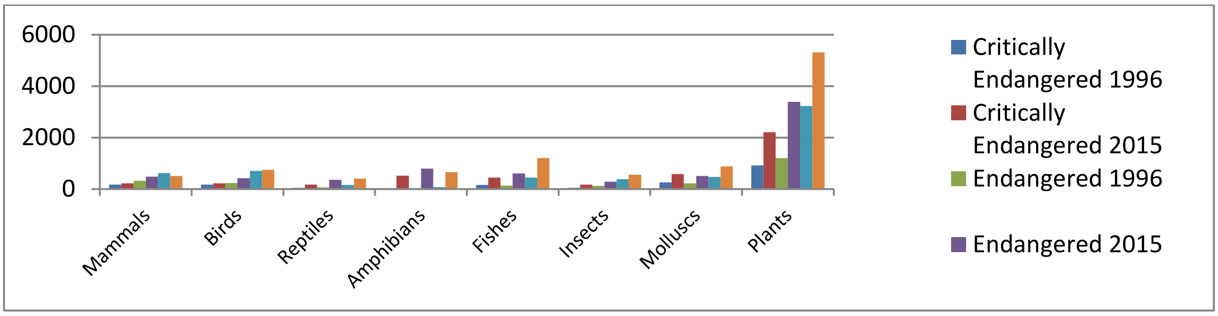


Picture 3

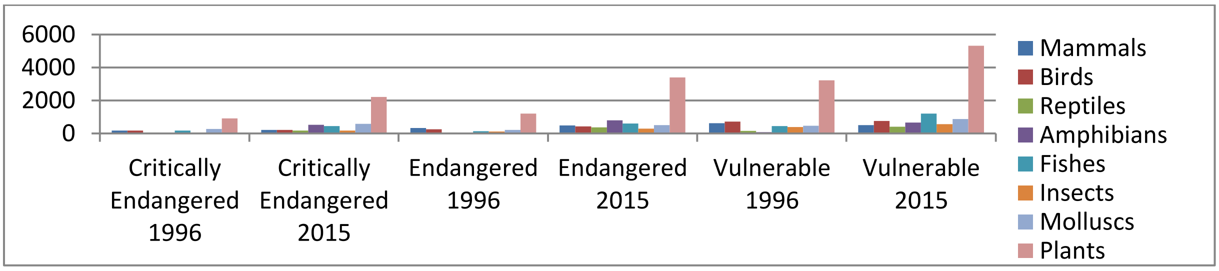
Many fungi and protest are not recognized and in waste and impassable areas of Amazonas/ large arable land/more .

Table 6: Fungi/protests

	Estimated number of described species	Number of species evaluated 2015	Number of threatened species 1996	Number of threatened species 2011
Lichens	17.000	4	4	2
Mushrooms	31.496	1	1	1
Brown Algae	3.784	15	6	6
	52.280	20	11	9



Picture 4

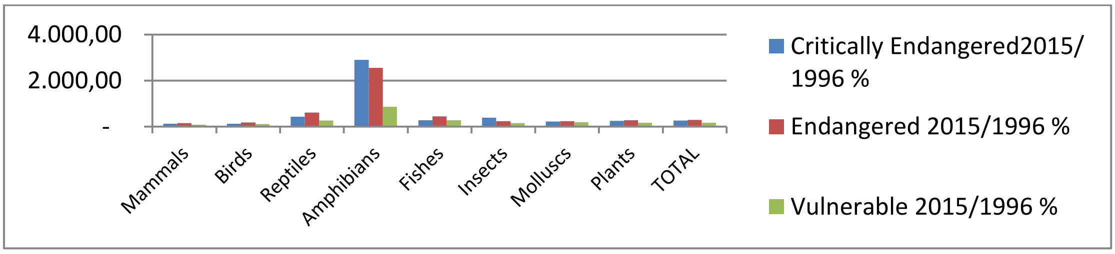


Picture 5

Comparing endangered species from 1996 to 2015 the most significant fact is that number of treated amphibians that rose at exponential rates, insects together with reptiles are listed as critically endangered for more than 300%, and plant families are not protected enough, declining at very fast rates.

Table 7: Critically Endangered 2015/1996%; Endangered 2015/1996%; Vulnerable 2015/1996 %

	Critically Endangered2015/ 1996 %	Endangered 2015/1996 %	Vulnerable 2015/1996 %
Mammals	125,44	153,02	82,68
Birds	126,79	178,30	105,26
Reptiles	424,39	606,78	260,78
Amphibians	2.900,00	2.554,84	862,67
Fishes	283,44	446,27	272,01
Insects	393,18	241,38	148,01
Molluscs	224,12	236,32	189,15
Plants	242,57	282,71	164,71
TOTAL	256,38	296,39	169,26

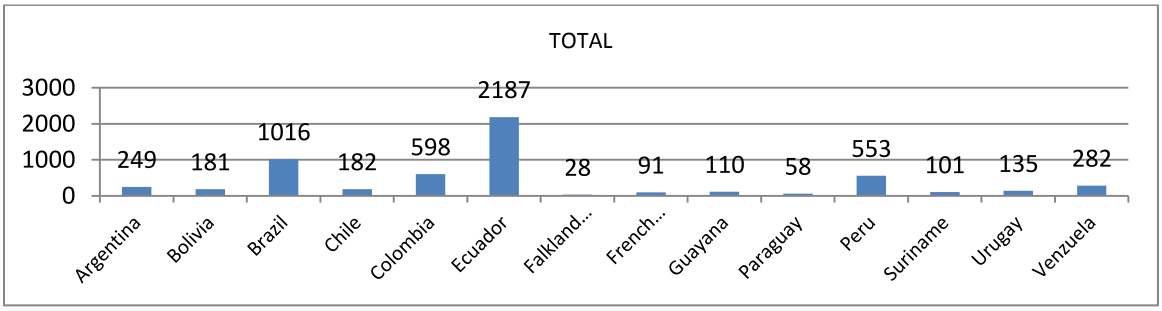


Picture 6

From total of 403 threatened mammals in South America 81 of them have their home in Brazil, this trend is continued further with birds family where from total of 768 birds species in South America, 164 that are threatened found their home in Brazil. From 445 threatened amphibians the largest number 86 those threatened has the same problem, and only plants from total 3357 (in Brazil 516) and Mollusca are more (from 78/22) are more treated in Equator (plants w almost 1/3 of total, and mollusks 48/78 have their natural space in Equator.

Table 8: Threatened species South America

	Mammals	Birds	Reptiles	Amphibians	Fishes	Mollusca	Other invert	Plants	**TOTAL**
Argentina	39	49	6	36	36	0	13	70	**249**
Bolivia	21	55	3	0	0	2	1	99	**181**
Brazil	**81**	**164**	**29**	**86**	**86**	**22**	**32**	**516**	**1016**
Chile	20	32	2	22	22	1	11	72	**182**
Colombia	56	119	22	61	61	0	33	246	**598**
Ecuador	**46**	**96**	**26**	**53**	**53**	**48**	**17**	**1848**	**2187**
Falkland Island	4	9	0	5	5	0	0	5	**28**
French Guiana	8	7	6	27	27	0	0	16	**91**
Guyana	11	14	5	28	28	0	1	23	**110**
Paraguay	9	27	3	0	0	0	0	19	**58**
Peru	55	121	9	21	21	4	4	318	**553**
Suriname	9	8	5	26	26	0	1	26	**101**
Uruguay	10	22	5	37	37	0	2	22	**135**
Venezuela	34	45	14	43	43	1	25	77	**282**
Total South America:	**403**	**768**	**135**	**445**	**445**	**78**	**140**	**3357**	**5771**

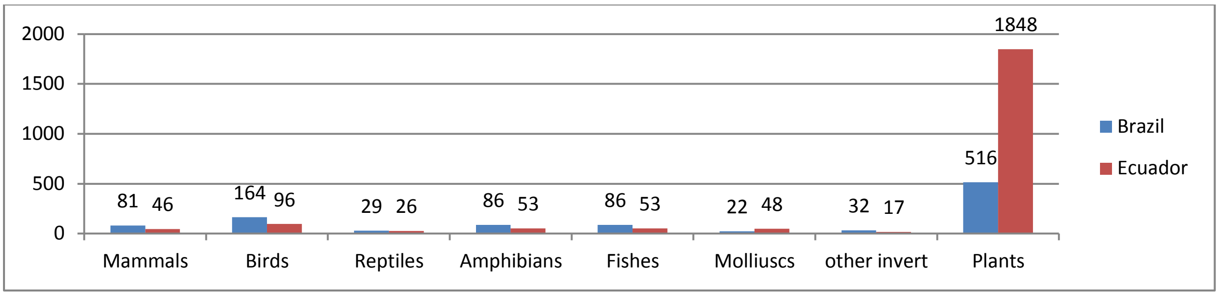


Picture7: Threatened species South America Total

Establishing the fact that variety of plant families are those on verge of extinction, and that many must be recognized, kept protected and saved not just in their natural environment but as the richness that can be grown in other parts of the world countries such as Brazil and Equator needs international support.

Table 9: Brazil and Equator, comparison, of total threatened species

	Mammals	Birds	Reptiles	Amphibians	Fishes	Mollusca	Other invert	Plants	TOTAL
Brazil	81	164	29	86	86	22	32	516	**1016**
Ecuador	46	96	26	53	53	48	17	1848	**2187**

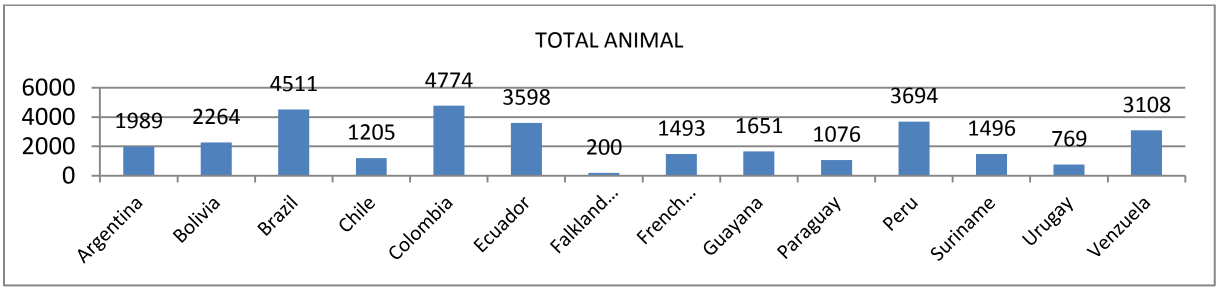


Picture 8: Brasil, Ecuador, threatened species

From total of 31.828 animal families that lives in South America those that are recognized as in danger and lives in Brazil are 4.511, just a few special less than in Colombia (4774). The worrisome fact is that many of animal life forms are still data deficient and scientist does not any rate of declining.

Table 10: Animals

	Extinct	Extinct in wild	**Subtotal**	Critically Endangered	Endangered	Vulnerable	**SUBTOTAL**	Near Threatened	Risk threatened	Data deficient	Least concern	**TOTAL**
Argentina	2	3	**5**	19	47	107	**173**	120	0	173	1518	**1989**
Bolivia	0	0	**0**	16	24	77	**117**	93	2	81	1971	**2264**
Brazil	**9**	**1**	**10**	**74**	**121**	**155**	**350**	**222**	**9**	**623**	**3297**	**4511**
Chile	0	0	**0**	20	21	69	**110**	72	0	225	798	**1205**
Colombia	2	0	**2**	84	151	271	**506**	200	2	458	3606	**4774**
Ecuador	6	0	**6**	82	130	248	**460**	164	2	319	2647	**3598**
Falkland Island	1	0	**1**	0	7	11	**18**	13	0	24	144	**200**
French Guiana	0	0	**0**	4	6	41	**51**	45	1	75	1321	**1493**
Guyana	0	0	**0**	6	9	49	**64**	55	2	87	1443	**1651**
Paraguay	0	3	**3**	4	8	27	**39**	51	0	30	953	**1076**
Peru	2	0	**2**	45	88	192	**325**	171	2	357	2837	**3694**
Suriname	0	0	**0**	4	7	39	**50**	48	0	70	1328	**1496**
Uruguay	0	0	**0**	8	21	52	**81**	41	0	59	588	**769**
Venezuela	2	0	**2**	33	68	134	**235**	109	1	274	2487	**3108**
	24	**7**	**31**	**399**	**708**	**1472**	**2579**	**1404**	**21**	**2855**	**24938**	**31828**



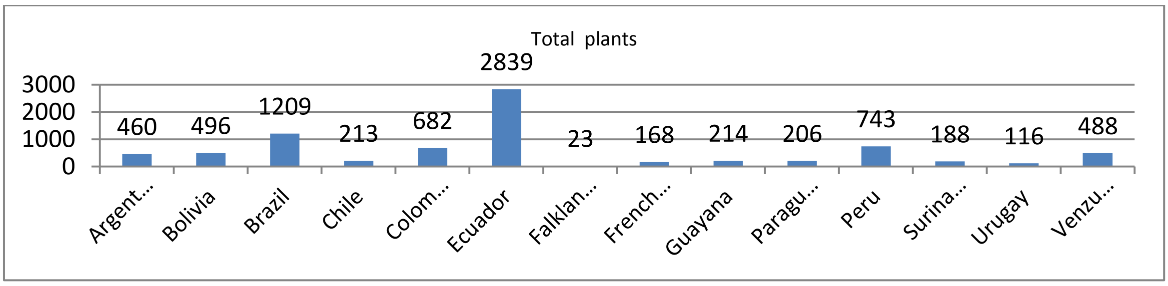
Picture 9

Picture: South America / Animals /Countries/ Extinct –Least concerned, Number of species

From total of life treated plants families 8.045 in South America 1.209 are ones that inhabits Brazil. While the similar but much worse trend is observed in Equator we can note that special attention of preservation of biodiversity need to be accented in Amazon region.

Table 11: Plants: extinct, extinct in wild, critically endangered, risk threatened, least concerned

	Exti nct	Extinct in wild	Sub total	Critically Endangered	Endangered	Vulnerable	SUBTOTAL	Near Threatened	Risk threatened	Data deficient	Least concern	Total
Argentina	0	1	1	7	21	42	70	22	1	18	338	460
Bolivia	1	3	4	7	21	71	88	26	3	23	341	496
Brazil	**5**	**3**	**8**	**78**	**183**	**255**	**618**	**91**	**22**	**57**	**515**	**1209**
Chile	1	3	4	21	24	27	72	17	1	8	111	213
Colombia	3	3	7	36	98	111	246	48	4	19	339	682
Ecuador	**3**	**4**	**9**	**252**	**670**	**920**	**1842**	**267**	**1**	**295**	**425**	**2839**
Falkland Island		6		0	5	0	6	1	0	1	16	23
French Guiana				3	2	11	18	2	1	1	136	168
Guyana				1	3	19	23	7	1	4	179	214
Paraguay				3	6	10	19	8	1	9	168	206
Peru	1	3	4	21	31	266	318	47	4	42	328	743
Suriname			0	1	2	23	28	3	0	7	150	188
Uruguay			0	4	5	13	22	1	0	4	88	116
Venezuela			0	3	10	64	77	74	2	8	307	488
	14	**26**	**37**	**437**	**1081**	**1832**	**3447**	**614**	**41**	**496**	**3441**	**8045**



Picture 10

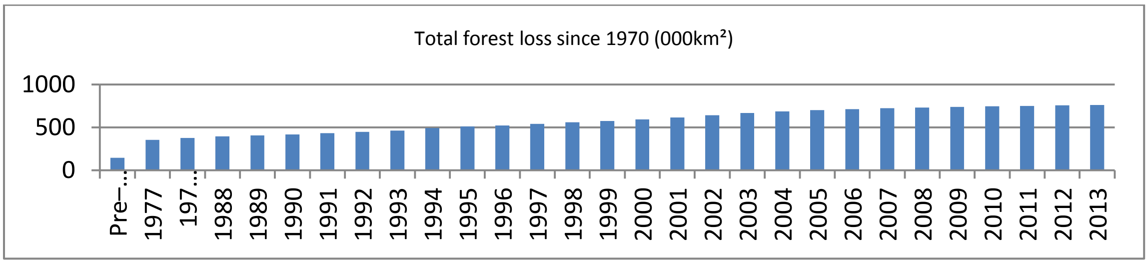
3. FOREST

Recognizing the fact that the large number of plants is put on verge of extinction in Brazil and Equator, further more detail analysis of Amazon region puts an accent on forest treasure: known as lungs of the world. From more than 5 mil km sq. in Brazil, the majority is in Amazon. In 1970 this number was around 4 mil km^2 , to be reduced in 2000 on 3,5 mil km^2, and further degraded in 2014 on 3,3 mil km^2. This declining trend is something that can further bring more severe biodiversity problems and disappearance of important and diverse plant and animals life forms.

Table 12: Estimating remaining forest Amazon km^2

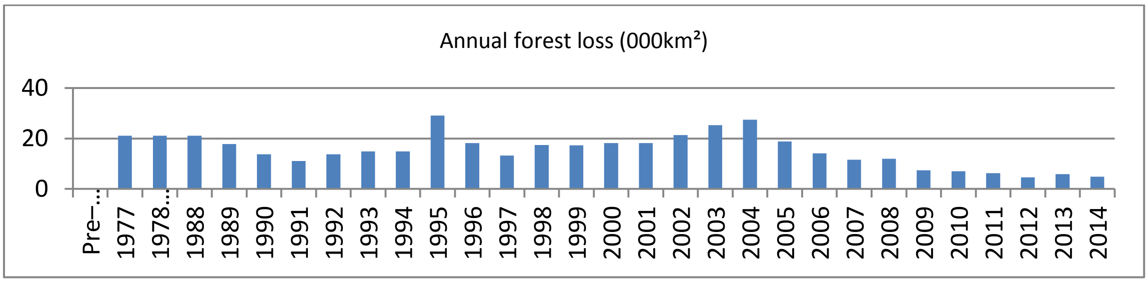
	Estimated remaining forest Amazon km^2
Pre–1970	4,100,000
2000	3,524,097
2014	3,339,446

Gradual and cumulative forest loss is observed on picture that follows and reached more than 500 thous. km^2 from 1977-now.



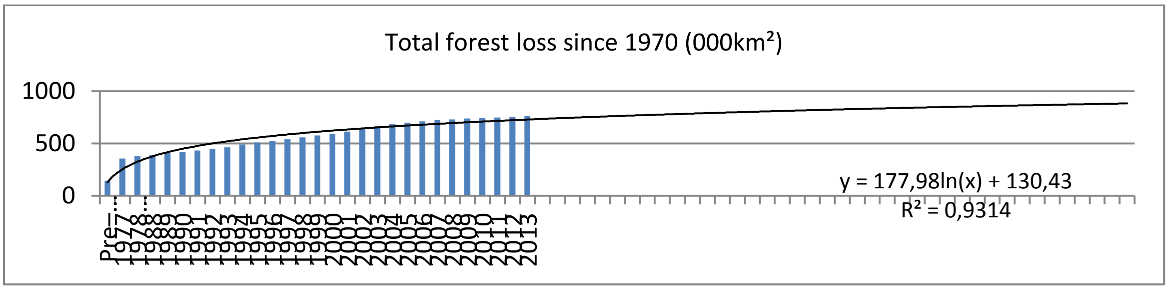
Picture 11

Further to observe is forest loss that is done in each period of time, and years such as 1995 and 2004 brought significant increase in forest reduction. Each year was marked with more than 20 the km^2 of forest loss.



Picture 12

With constant rate observed so far it can be forecasted further degrading situation in 100 year period that would bring forest in much worse state and further bring variety of life in danger.

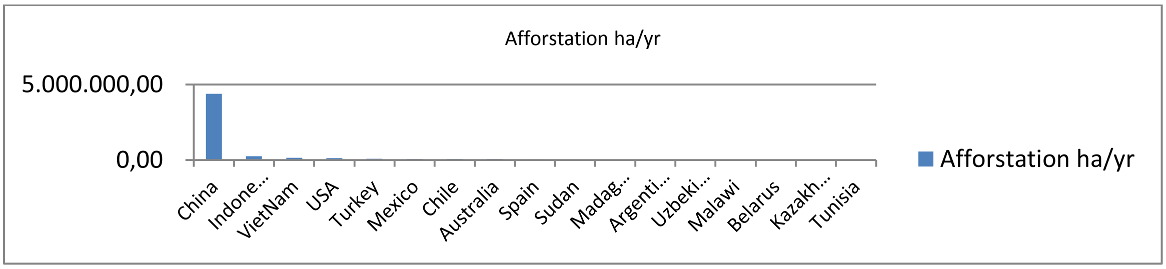


Picture 13

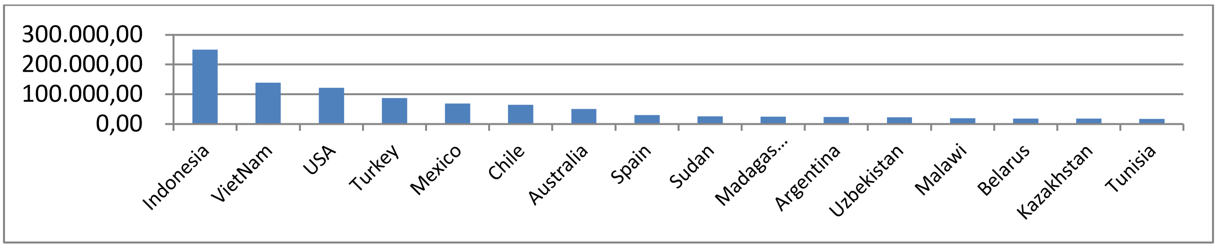
Importance of forest not just as place of home for many life forms, but a place where world gets enough oxygen and reduce negative impact of CO_2 emissions. By ercognising the problem countries fight back with afforestation projects. The largest projects are undertaken in China, Indonesia, Vietnam and USA and these countries can further help African and South American Community with practical example and support.

Table 13: Afforestation km^2/yr.

		Afforestation ha/yr	Afforestation km^2/yr
1	China	4.385.000,00	43.850,00
2	Indonesia	250.420,00	2.504,20
3	Vietnam	138.920,00	1.389,20
4	USA	121.532,00	1.215,32
5	Turkey	87.300,00	873,00
6	Mexico	69.200,00	692,00
7	Chile	64.331,00	643,31
8	Australia	50.000,00	500,00
9	Spain	30.461,00	304,61
10	Sudan	25.630,00	256,30
11	Madagascar	25.000,00	250,00
12	Argentina	23.200,00	232,00
13	Uzbekistan	22.000,00	220,00
14	Malawi	18.700,00	187,00
15	Belarus	18.136,00	181,36
16	Kazakhstan	18.000,00	180,00
17	Tunisia	16.700,00	167,00



Picture 14

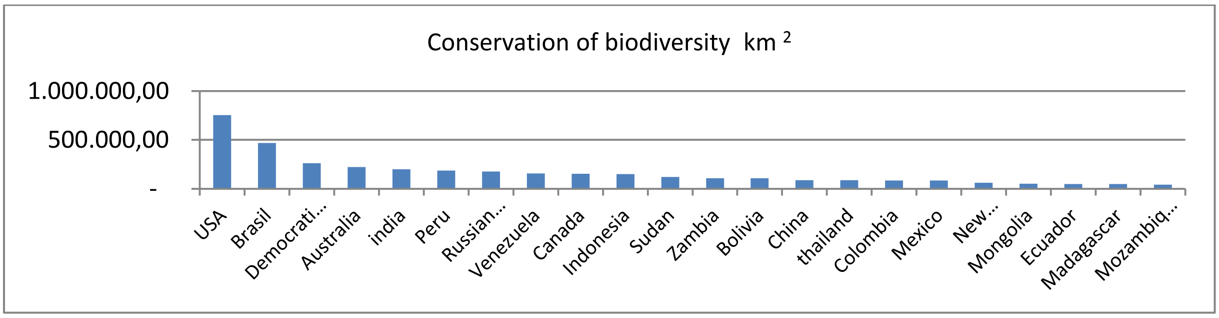


Picture 15

The largest areas of forest that are under conservation status are as expected in USA and Brazil.

Table 14: Conservation of biodiversity 1.000 ha

		Conservation of biodiversity 1000 ha
1	USA	75.277,00
2	Brazil	46.966,00
3	Democratic Republic Congo	26.314,00
4	Australia	22.371,00
5	India	19.761,00
6	Peru	18.505,00
7	Russian Federation	17.572,00
8	Venezuela	15.755,00
9	Canada	15.284,00
10	Indonesia	15.144,00
11	Sudan	11.891,00
12	Zambia	10.680,00
13	Bolivia	10.680,00
14	China	8.904,00
15	Thailand	8.853,00
16	Colombia	8.543,00
17	Mexico	8.488,00
18	New Zealand	6.259,00
19	Mongolia	5.152,00
20	Ecuador	4.805,00
21	Madagascar	4.752,00
22	Mozambique	4.143,00

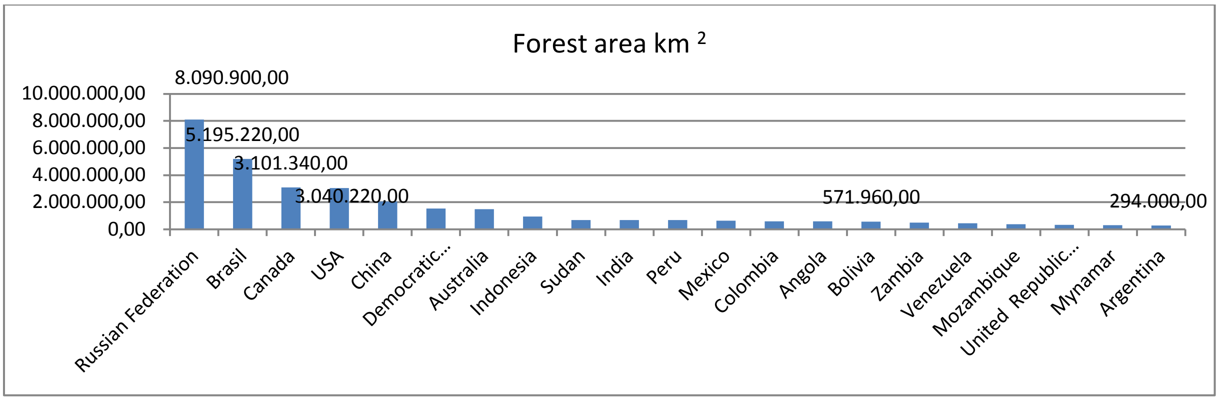


Picture 16

Very unequal and lower than expected forest area are spread throughout world. The area in Russia, Canada, Brazil and Congo are the most important for continents. What differs them is level of GDP, forest area that is reduced each year, variety of species inhabited in each, methods of preservation, possibility of control, influence of GDP on cutting and reduction, influence of other commodities such as gas, coal, oil richness and level of usage and forest degradation, and increase of renewables as relation between land and forest reduction. Brazil is in that respect put on top of the list while is important for South America, have the most vivid and diverse life form (animals, plants), further degradation of Amazon cannot be easy or at all substituted due to large water and river areas, negative effects can further bring large flooding/economic decrease not just in Brazil , but in whole South America.

Table 15: Total forest area km^2

	Total Forest area km^2 cca.
Russian Federation	8.090.900,00
Brazil	5.195.220,00
Canada	3.101.340,00
USA	3.040.220,00
China	2.068.610,00
Democratic Republic Congo	1.541.350,00
Australia	1.493.000,00
Indonesia	944.320,00
Sudan	699.490,00
India	684.340,00
Peru	679.220,00
Mexico	648.020,00
Colombia	604.990,00
Angola	584.800,00
Bolivia	571.960,00
Zambia	494.680,00
Venezuela	462.750,00
Mozambique	390.220,00
United Republic Tanzania	334.280,00
Myanmar	317.730,00
Argentina	294.000,00

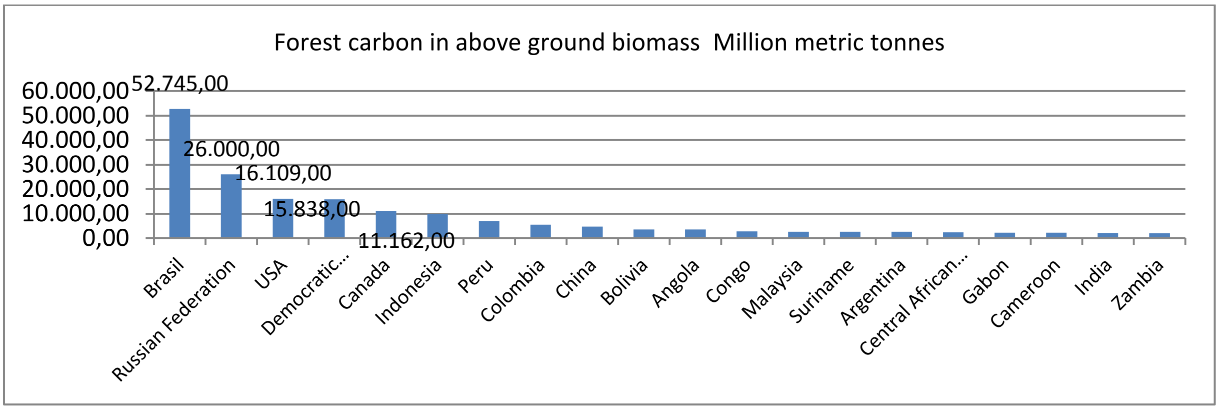


Picture 17

Having said that we must further note that Brazil has forest carbon in above ground biomass in largest quantities in the world 52.745 mil metric ton in front of Russia (26.000 mil metric ton) and USA (26.000 mil metric ton).

Table 16: Forest carbon in above ground biomass Mill metric tons

		Forest carbon in above ground biomass Million metric tons
1	Brazil	52.745,00
2	Russian Federation	26.000,00
3	USA	16.109,00
4	Democratic Republic Congo	15.838,00
5	Canada	11.162,00
6	Indonesia	9.787,00
7	Peru	6.903,00
8	Colombia	5.488,00
9	China	4.675,00
10	Bolivia	3.582,00
11	Angola	3.536,00
12	Congo	2.773,00
13	Malaysia	2.590,00
14	Suriname	2.553,00
15	Argentina	2.553,00
16	Central African Republic	2.307,00
17	Gabon	2.186,00
18	Cameroon	2.174,00
19	India	2.129,00
20	Zambia	1.948,00

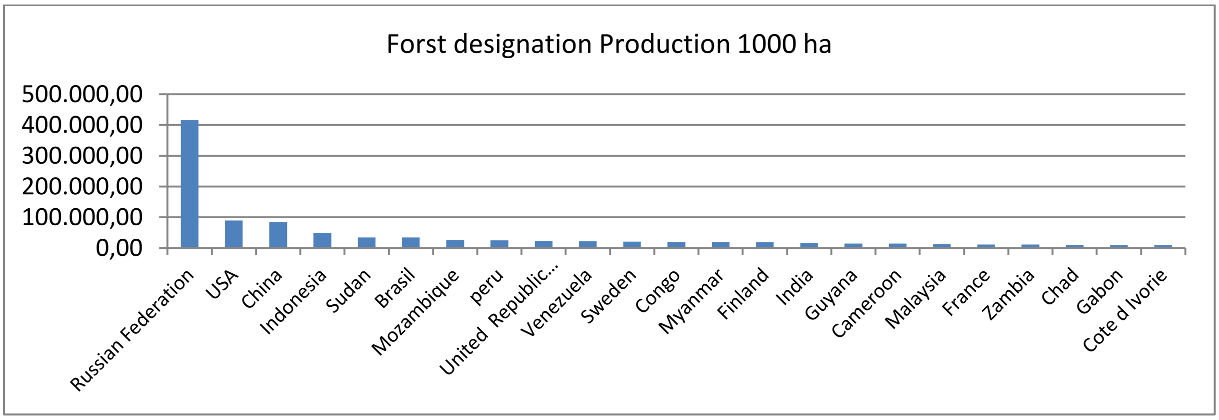


Picture 18

Forest designation production is by far the largest in Russia. In Brazil designation forest production is 34 mil ha.

Table 17: Forest designation production 1.000 ha

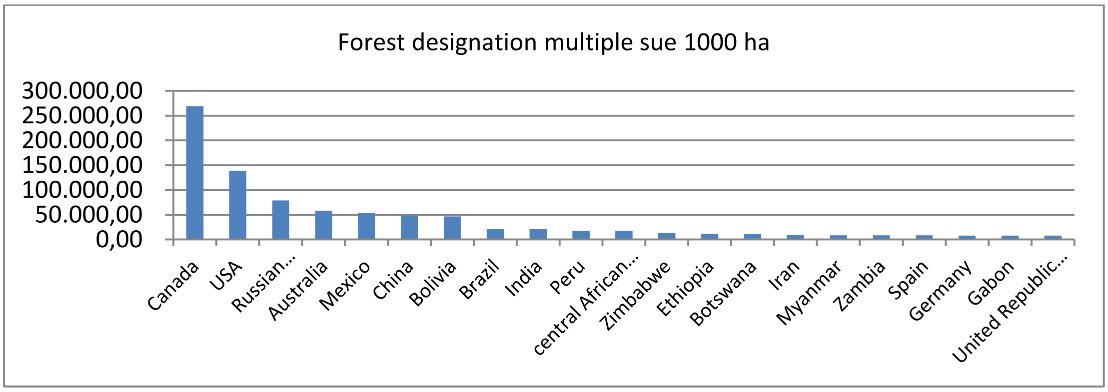
		Forest designation Production 1000 ha
1	Russian Federation	415.791,00
2	USA	90.007,00
3	China	84.304,00
4	Indonesia	49.680,00
5	Sudan	34.975,00
6	Brazil	34.251,00
7	Mozambique	26.212,00
8	Peru	24.900,00
9	United Republic Tanzania	23.571,00
10	Venezuela	22.605,00
11	Sweden	20.901,00
12	Congo	19.768,00
13	Myanmar	19.633,00
14	Finland	19.197,00
15	India	17.403,00
16	Guyana	14.696,00
17	Cameroon	14.561,00
18	Malaysia	12.739,00
19	France	11.904,00
20	Zambia	11.888,00
21	Chad	10.366,00
22	Gabon	9.987,00
23	Cote d Ivorie	9.230,00



Picture 19

Table 18: Forest designation multiple sue 1000 ha

		Forest designation multiple sue 1000 ha
1	Canada	268.899,00
2	USA	138.738,00
3	Russian Federation	78.743,00
4	Australia	58.371,00
5	Mexico	53.111,00
6	China	48.721,00
7	Bolivia	46.496,00
8	Brazil	20.776,00
9	India	20.567,00
10	Peru	17.695,00
11	Central African Republic	17.532,00
12	Zimbabwe	12.792,00
13	Ethiopia	11.785,00
14	Botswana	11.351,00
15	Iran	9.422,00
16	Myanmar	8.707,00
17	Zambia	8.434,00
18	Spain	8.375,00
19	Germany	8.179,00
20	Gabon	8.000,00
21	United Republic of Tanzania	7.857,00

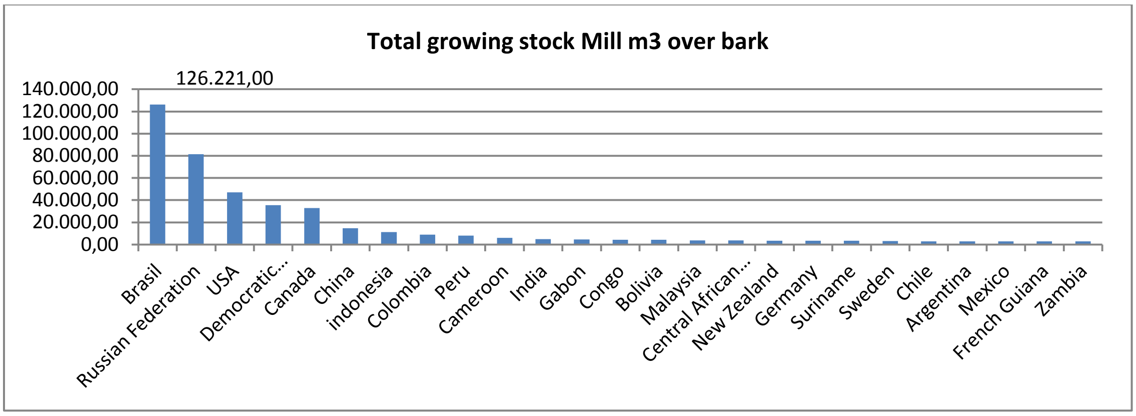


Picture 20

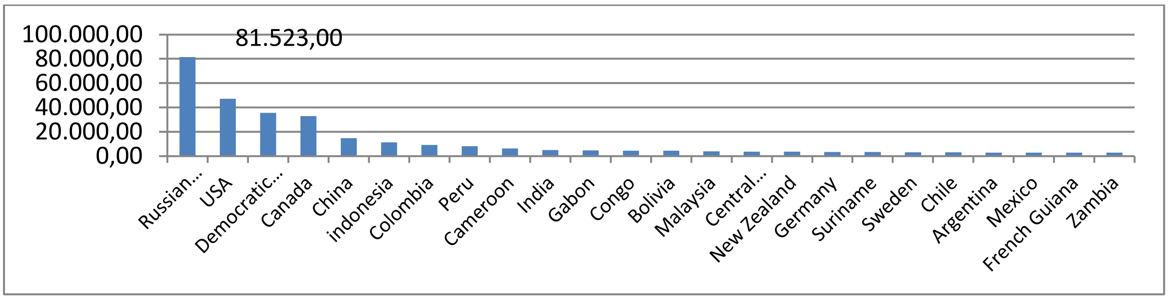
Total growing stock has surpassed Russia and USA with 126.221 mil m^3 .

Table 19: Total growing stock mil m^3 over bark

		Total growing stock Mill m^3 over bark
1	Brazil	126.221,00
2	Russian Federation	81.523,00
3	USA	47.088,00
4	Democratic Republic of Congo	35.473,00
5	Canada	32.983,00
6	China	14.683,00
7	Indonesia	11.343,00
8	Colombia	8.982,00
9	Peru	8.159,00
10	Cameroon	6.141,00



Picture 21

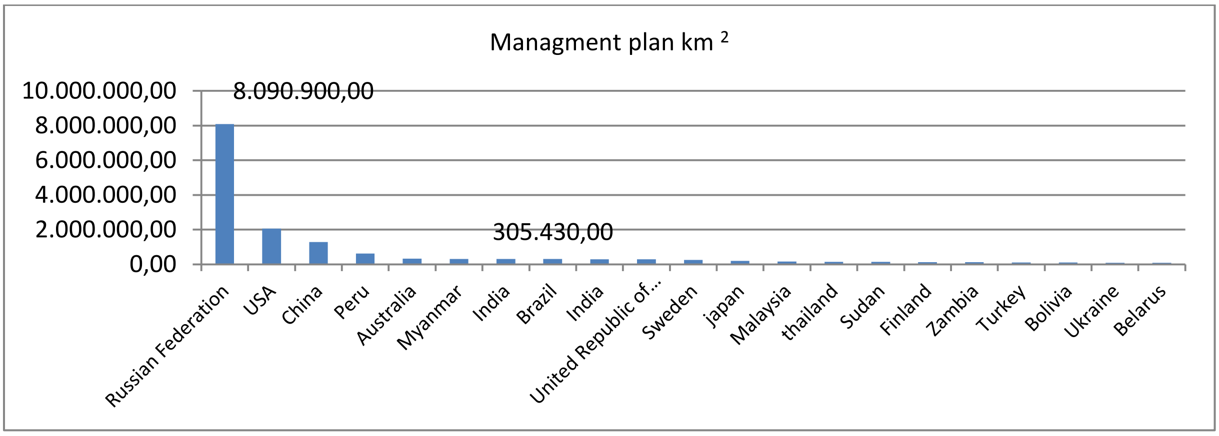


Picture 22

Developed management plan seems to exist by biggest area support in Russia nd USA.

Table 20: Management plan

		Management plan km^2
1	Russian Federation	8.090.900,00
2	USA	2.060.840,00
3	China	1.285.000,00
4	Peru	614.270,00
5	Australia	317.810,00
6	Myanmar	312.730,00
7	India	305.970,00
8	Brazil	305.430,00
9	India	285.770,00
10	United Republic of Tanzania	282.030,00
11	Sweden	249.790,00
12	Japan	189.410,00
13	Malaysia	163.810,00
14	Thailand	148.550,00
15	Sudan	144.970,00
16	Finland	114.790,00
17	Zambia	114.790,00
18	Turkey	113.340,00
19	Bolivia	104.000,00
20	Ukraine	89.000,00
21	Belarus	86.300,00

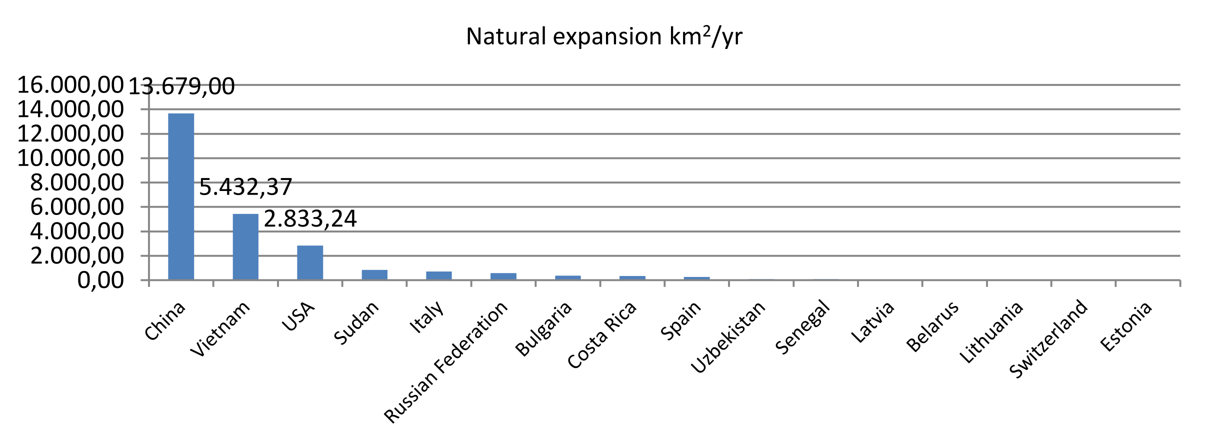


Picture 23

Brazil is not on the top of the list as the country with large and significant expansion of forest and that is the main reason for conservation and keeping existing wood treasure with further good and caring legal,political and economic support.

Table 21: Natural expansion

		Natural expansion km^2/yr.
1	China	13.679,00
2	Vietnam	5.432,37
3	USA	2.833,24
4	Sudan	853,40
5	Italy	705,31
6	Russian Federation	583,20
7	Bulgaria	372,67
8	Costa Rica	339,83
9	Spain	263,39
10	Uzbekistan	80,00
11	Senegal	77,57
12	Latvia	66,32
13	Belarus	65,72
14	Lithuania	54,20
15	Switzerland	45,52
16	Estonia	26,34

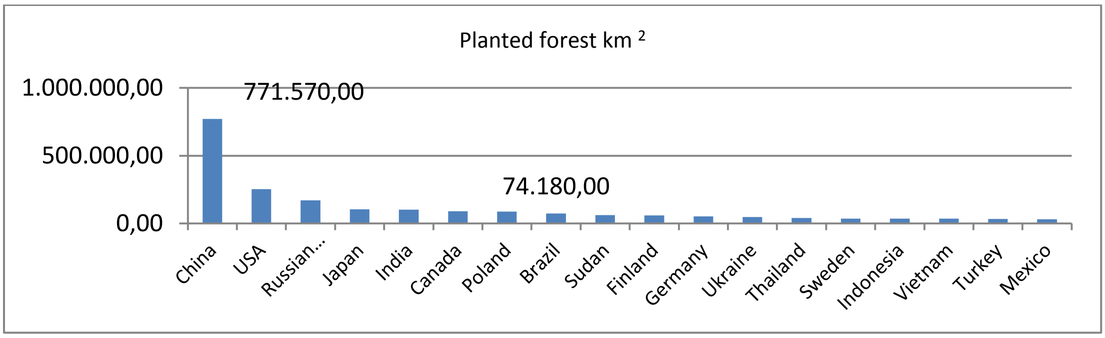


Picture 24

Planted forest is the biggest in China with 771.570 km^2 of planted area. Brazil has only 74.180 km^2 planted forest out of total 5.100.000 km^2.

Table 22: Planted forest km^2

		Planted forest 1000 ha	Planted forest km^2
1	China	77.157,00	771.570,00
2	USA	25.363,00	253.630,00
3	Russian Federation	16.991,00	169.910,00
4	Japan	10.326,00	103.260,00
5	India	10.211,00	102.110,00
6	Canada	8.963,00	89.630,00
7	Poland	8.889,00	88.890,00
8	Brazil	7.418,00	74.180,00
9	Sudan	6.068,00	60.680,00
10	Finland	5.904,00	59.040,00
11	Germany	5.283,00	52.830,00
12	Ukraine	4.846,00	48.460,00
13	Thailand	3.986,00	39.860,00
14	Sweden	3.613,00	36.130,00
15	Indonesia	3.549,00	35.490,00
16	Vietnam	3.512,00	35.120,00
17	Turkey	3.418,00	34.180,00
18	Mexico	3.203,00	32.030,00

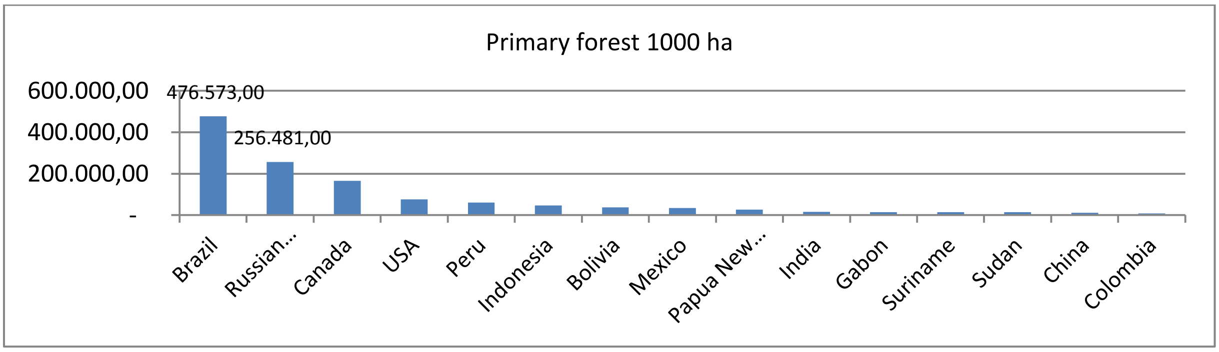


Picture 25

Primary forest in Brazil is significant 476 mil h in front of Russia (256 mil ha) and Canada (165 mil ha).

Table 23: Primary forest 1 000 ha

		Primary forest 1000 ha
1	Brazil	476.573,00
2	Russian Federation	256.481,00
3	Canada	165.448,00
4	USA	75.277,00
5	Peru	60.178,00
6	Indonesia	47.236,00
7	Bolivia	37.164,00
8	Mexico	34.310,00
9	Papua New Guinea	26.210,00
10	India	15.701,00
11	Gabon	14.334,00
12	Suriname	14.001,00
13	Sudan	13.990,00
14	China	11.632,00
15	Colombia	8.543,00

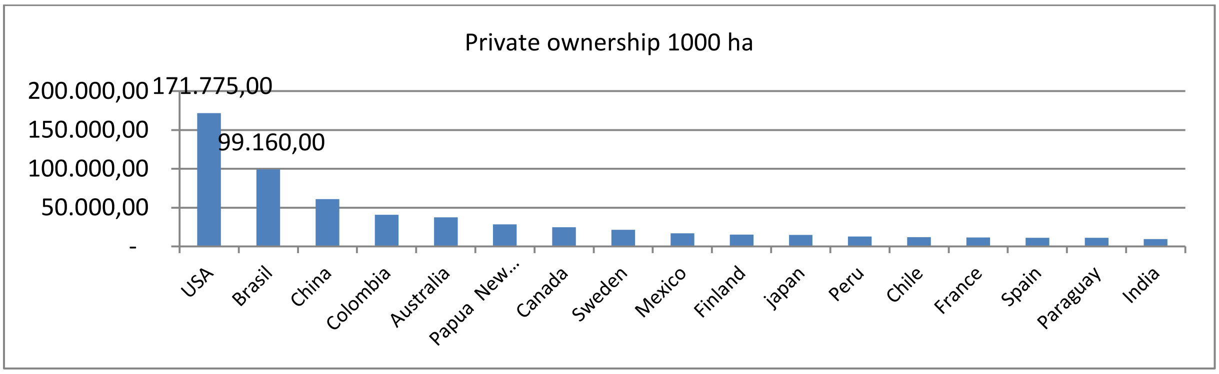


Picture 26

As expected the largest private property of forest is in USA, Brazil has 991.600 km^2 of private and 4.313.349 km^2 of public forest area.

Table 24: Private ownership km^2

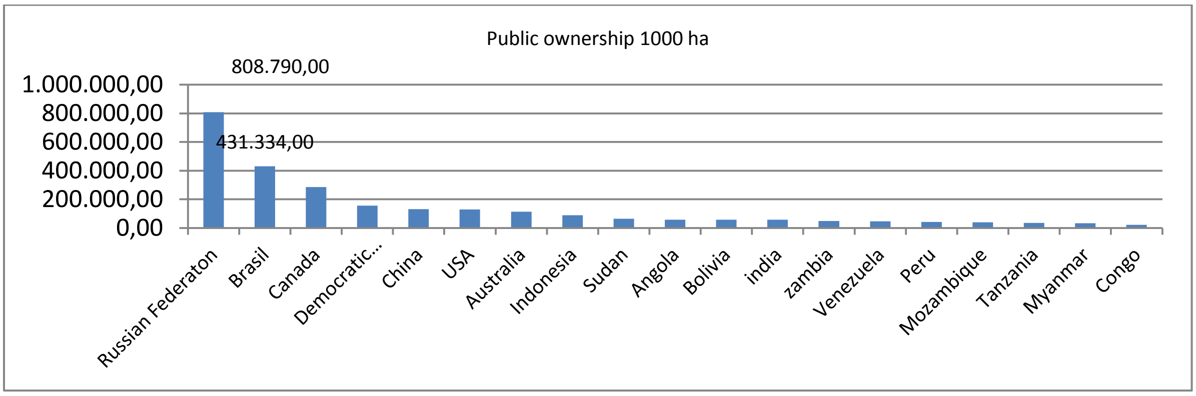
		Private ownership 1000 ha	Private ownership km^2
1	USA	171.775,00	1.717.750
2	Brazil	99.160,00	991.600
3	China	60.946,00	609.460
4	Colombia	40.797,00	407.970
5	Australia	37.348,00	373.480
6	Papua New Guinea	28.554,00	285.540
7	Canada	24.538,00	245.380
8	Sweden	21.573,00	215.730
9	Mexico	16.997,00	169.970
10	Finland	15.168,00	151.680
11	Japan	14.793,00	147.930
12	Peru	12.617,00	126.170
13	Chile	12.046,00	120.460
14	France	11.688,00	116.880
15	Spain	11.337,00	113.370
16	Paraguay	11.207,00	112.070
17	India	9.702,00	97.020



Picture 27

Table 25: Public ownership km^2

		Public ownership 1000 ha	Public ownership km^2
1	Russian Federation	808.790,00	8.087.900
2	Brazil	431.334,00	4.313.340
3	Canada	285.587,00	2.855.870
4	Democratic Republic Congo	155.692,00	1.556.920
5	China	132.098,00	1.320.980
6	USA	130.333,00	1.303.330
7	Australia	114.483,00	1.144.830
8	Indonesia	89.449,00	894.490
9	Sudan	63.889,00	638.890
10	Angola	59.104,00	591.040
11	Bolivia	58.714,00	587.140
12	India	58.007,00	580.070
13	Zambia	50.301,00	503.010
14	Venezuela	47.713,00	477.130
15	Peru	42.340,00	423.400
16	Mozambique	40.055,00	400.550
17	Tanzania	35.295,00	352.950
18	Myanmar	33.280,00	332.800
19	Congo	22.471,00	224.710

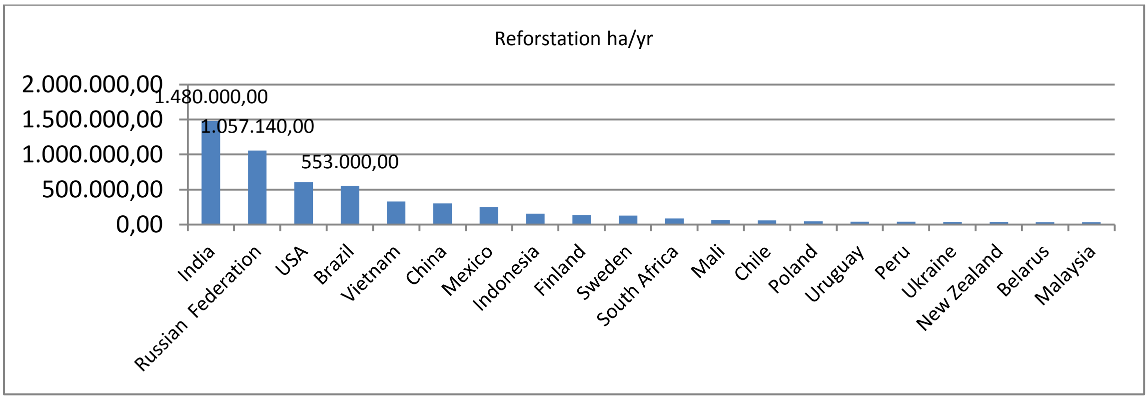


Picture 28

Very slow and significant rate of reforestation is visible throughout the world if compared with large increase of CO_2 emissions. Brazil has only 5.530 km ^{2}/yr.

Table 26: Reforestation km^2/yr.

		Reforestation ha/yr	Reforestation km ^{2}/yr
1	India	1.480.000,00	14.800
2	Russian Federation	1.057.140,00	10.571
3	USA	606.215,00	6.062
4	Brazil	553.000,00	5.530
5	Vietnam	327.785,00	3.278
6	China	304.000,00	3.040
7	Mexico	247.600,00	2.476
8	Indonesia	153.941,00	1.539
9	Finland	133.680,00	1.337
10	Sweden	130.550,00	1.306
11	South Africa	87.673,00	877
12	Mali	65.000,00	650
13	Chile	59.956,00	600
14	Poland	46.811,00	468
15	Uruguay	42.660,00	427
16	Peru	42.428,00	424
17	Ukraine	37.139,00	371
18	New Zealand	36.000,00	360
19	Belarus	34.362,00	344
20	Malaysia	33.009,00	330

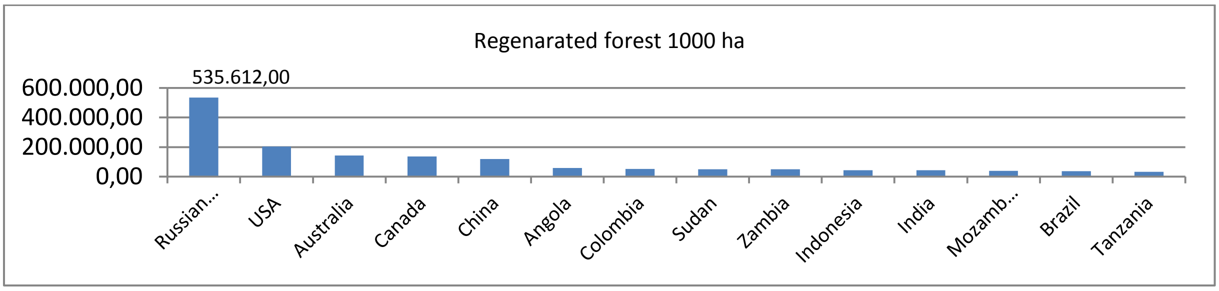


Picture 29

What is further disadvantage of Brazilian forest if compared with Russia is much lower level of regenerated area. In Russia it is 5.356.120 km^2 while Brazil has only 355.320 km^2 regenerated forest.

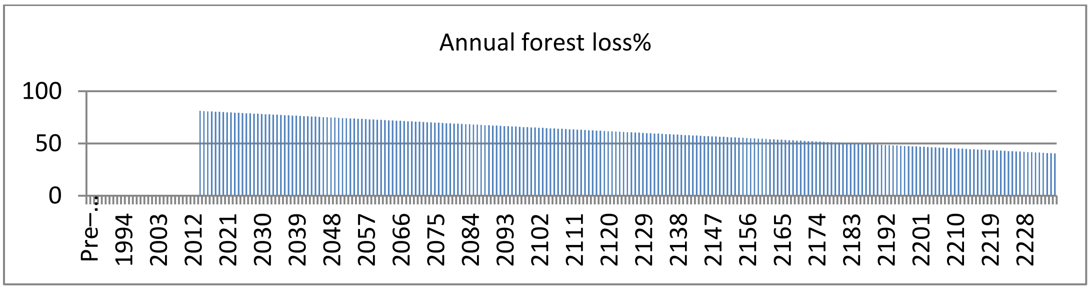
Table 27: Regenerated forest km^2

		Regenerated forest 1000 ha	Regenerated forest km^2
1	Russian Federation	535.612,00	5.356.120
2	USA	203.382,00	2.033.820
3	Australia	142.359,00	1.423.590
4	Canada	135.723,00	1.357.230
5	China	118.071,00	1.180.710
6	Angola	58.352,00	583.520
7	Colombia	51.551,00	515.510
8	Sudan	49.891,00	498.910
9	Zambia	49.406,00	494.060
10	Indonesia	43.647,00	436.470
11	India	42.522,00	425.220
12	Mozambique	38.960,00	389.600
13	Brazil	35.532,00	355.320
14	Tanzania	33.188,00	331.880

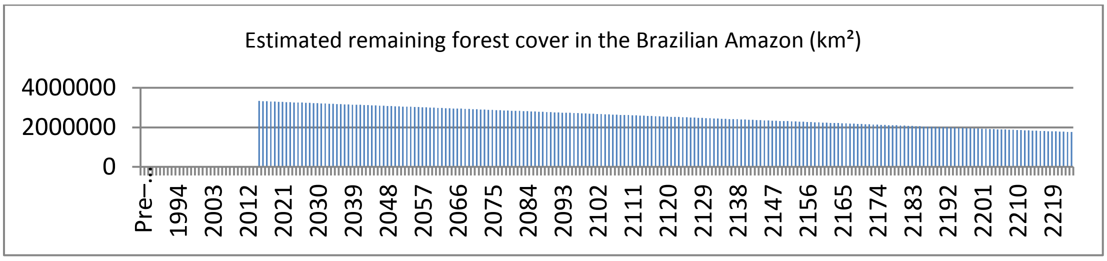


Picture 30:

Without forest preservation and loss of area around 7.500 km^2 each year a forest would decrease significantly (double) in period 1970/2230.



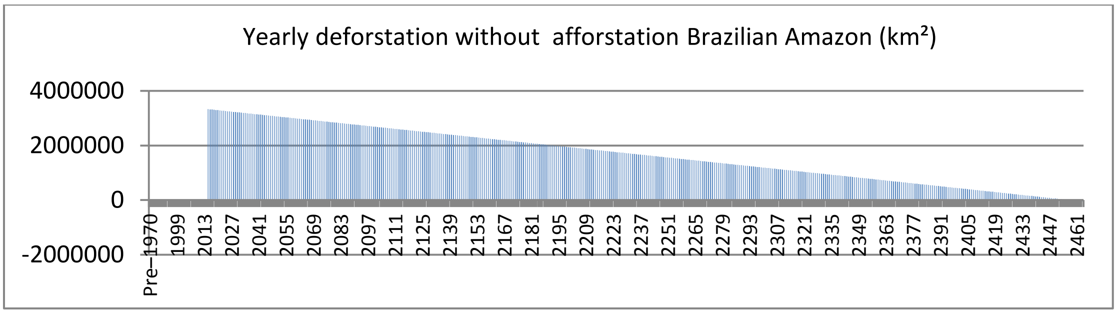
Picture 31: Annual loss 7500 km^2



Picture 32

Without any protection, afforestation and same rate of reduction the nightmare scenario of forest loss would be done only in 500 years.

Yearly loss 7500-7600 km^2

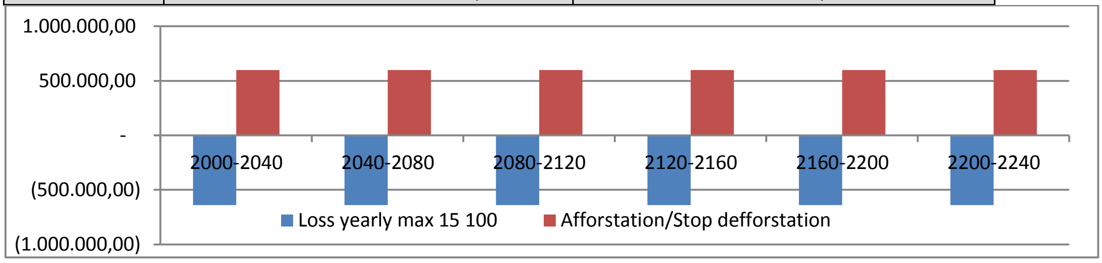


Picture 33

For Brazil is not enough to have good afforestation plan, but keep actively on preservation of existing, developing the new renewable sources of energy, and actively promote new areas of forest on south.

Table 28: Afforstation/defforstation Possibilities ,Trends so far

	Loss yearly max 15 100 km^2	Afforstation / Stop defforstation
2000-2040	- 639.080,00	600.000,00
2040-2080	- 639.080,00	600.000,00
2080-2120	- 639.080,00	600.000,00
2120-2160	- 639.080,00	600.000,00
2160-2200	- 639.080,00	600.000,00
2200-2240	- 639.080,00	600.000,00
Total	- 3.834.480,00	3.600.000,00



Picture 34

This statistical analysis and comparison with the world situation is just the first step in observing significance of forest. The further more thorough and detail analysis along with potentials is presented in Table 29. Forest has direct and indirect use value in use value and it has non use value in positive and negative form such as - potential projects, existence, bequest value. When calculating value in project many types of research conclusions need to be incorporated in end result.

Table 29: Having forest

Total economic value						interest rate
		USE VALUE	direct use value	parks, scientific research, CO_2 reduction, biodiversity, number of hotels, tourist arrivals, number of extra services connected(taxi, water boats), tax collection , tariffs from tourist arrivals, pictures, marketing etc.	PV=-C+ (R-C)/(1+r)1...n ; -C building of tourist attraction, buying property, leasing, etc. R = revenue from direct usage=Cost from usage; r market economic interest rate	can be negative to positive
		USE VALUE	indirect use value	tree diversity, regulation flood, prevention of flood, natural water purification, air pollution prevention,	PV = e t/(1+re air) 1..n+ e t/(1+re water purification) 1..n+ e t/(1+re noise) 1..n+ e t/(1+re biodiversity) 1..n+e ; Interest rate= historic values of each category+ forecast value 10-20 year in span future; based on currently recognized method of forecast; (many variables approach-factor approach)	interest rate cannot be negative; each can be separated according to activity based on past value of environment (temperature, air ,flood history) and possibly forecast value in the future

		USE VALUE	option value	future use as park, clean resources, possible land usage, ethanol production, biodiversity resort	PV= -C+ (R-C) /(1+r) 1..N+ et/(1+r) t different indirect values	can be negative and positive
		NON USE VALUE	bequest value	future generation possible use	Use=economic+biodiversity value +e	
		NON USE VALUE	existence value	right of existence	Existence, legal: ownership, biodiversity,	
		NON USE VALUE	world issue	forest area-plum of the world, CO_2 reduction, biodiversity		

The same type of explaining procedure that put monetary and non-monetary values is in case of decision whether having a forest or ethanol filed. In only that case end decision can be valued properly.

Table 30: Having sugar field, ethanol

Total economic value					
	1.	use value	direct use value	sugar field t/ha; price of product, transport fuel, way of energy diversification; number of working places	PV=-C+ (R-C)/(1+r)1…n ; -C - buying leasing land, seed, machinery;, revenue - liters sold; Cost -employees, seed, fuel , energy spend etc.
		use value	indirect use value	crop change, possibility to farm, (other culture than ethanol); pig, cow chicken, number of new settlements; number of rural population increases,	PV other usage+ PV other culture+PV number of rural settlement increases+PV energy security+ PV transport potentail+PV import possibilities
		use value	option value	to cultivate another culture, to have farm facilities; to replant, afforestation with planned tree population, other	
	2.	nonuse value	bequest value	question of land ownership; possibilities of future use; work places, area of future industrial sites and development	

		nonuse value	existence value	possibility of further usage, crops , working places, eatable plants, etc.	
		nonuse value	world issue	energy security, different plants cultivation prospect, export of different crops; etc.	

Each decision process has elements of economic and non-economic approach. While economic approach is concerned with cost and benefits in terms of market, social, environment, non-economic reasoning is done on interview base, consultation, focus group approach, delph surveys etc.

Table 31: Economic and non-economic approach

		economic		non-economic approach	
market price		mostly used for goods but also for some cultural and regulating services		consultative method	direct/indirect use
market cost					direct/indirect use
	replacement cost approaches	the value of groundwater recharge can be estimated from the costs of obtaining water from another source substitute cost		in depth interview	direct/indirect use
	damage cost avoided approaches	the value of flood control can be derived from estimating damage if flooding would occur		deliberative and participatory approaches	direct/indirect use
	mitigation restoration cost	cost of preventive expenditure in absence of wetland service or relocation		focus group in depth	direct/indirect use
	production function approaches	how soil fertility improves crop yield and therefore the income of the farmers and how water quality improvements increases commercial fisheries catch and thereby incomes of fisheries			direct/indirect use
revealed preference methods				citizen juries	
	travel cost method	part of recreate value of a site is reflected in the amount to time and money that people spend while traveling to site		health based valuation approaches	direct use
	hedonic cost method	clean air, presence of water and aesthetic value views will increase the price of surrounding real estate		q methodology	direct/indirect use
stated preferences method				Delphi surveys	use/non use

	choice modeling	different methods: choice experiments, contingent ranking, contingent rating and pair comparison		rapid rural appraisal	use/non use
	contingent valuation	Sometimes the only value to estimate the nonuse value. A survey questionnaire might ask respondents to express their willingness to increase the level of water quality in a stream, lake or river so that they might enjoy activities like swimming boating fishing		participatory rural appraisal	use/non use
					use/non use
participatory approaches to valuation		it allows addressing shortcomings of reviled preferences methods such as preferences construction during survey and lack of knowledge of respondents about what they are being ask to allocate values		participatory action research	use/non use
	deliberative valuation			methods for reviewing information	use/non use
	mediated modeling			systematic reviews	use/non use
benefits transfer		Transfer to others			

Importance of cooperation inside country, on regional and even world scale is further pointed out in a simple procedure.

1) In country there is different kind of cooperation possible between –Government, Legal bodies, Political parties, legislative procedure, industries, research scientific centers, agricultural bio producers, forest industry, parks, tourism and etc.

   They can cooperate in a way to work together on preserving forest and have maximum direct/indirect use and values obtaining (1, 1) strategy case. It is possible that each interest center impose its goals and weak relation brings (0,0) game results.

   In country situation is often between these two positions leading to (0,1) or (1,0) end case – that is interest can vary between industry and bio preservation goals .

2) Further options that are made are in having regional and world cooperation, opinion, monetary or non-monetary support or interest for further forest and land usage making industrial, agricultural sites. For region negative consequences at the end can bring further cooperation, for population throughout world existence value do have importance.

   Interest group that are the most recognized are: banks, industries, financers, tourist, research scientist, to all population in world having opportunity to protect each plant, animal as gift to existence value.

   It is a calculation that aims toward measurement and respect of many direct costs/benefits, indirect benefits/costs.

Future

Country		Region/World		bequest	existence	End result	
Cooperate	Defect			monetary	non-monetary		
(1,1)	(1,0)	(1,1,1) (1,1,0)	(1,1,0) (1,0,1)	(1,1,1,1) (1,1,1,0) (0,1,1,1)	(1,1,0,0) (1,0,0,1) (0,0,1,1)	PV (current, economic, social, environmental) +Future Monetary + Non-monetary base all possible cases	PV (Economic +Environment) Direct ,indirect
(0,1)	(0,0)	(0,0,1) (0,1,1)	(0,0,0) (0,0,1)	(0,0,1,1) (0,1,1,1) (1,1,0,0)	(0,0,0,0) (0,0,0,1) (1,0,0,0)	PV (Economic +Social) direct indirect,	PV (only economical costs
				direct usage	indirect usage		
				economic	scientific		

Past

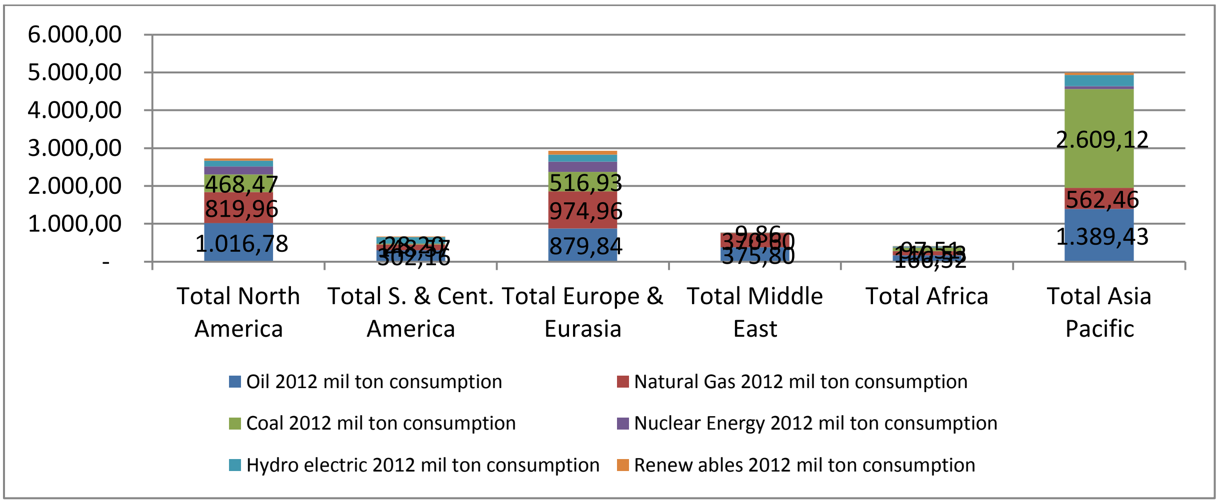
1 2 3 4

4. CONSUMPTION OF PRIMARY ENERGY (Mil.ton oil equiv.)

Increased Consumption of primary energy is due to increased number of population, GDP growth, industrial developments, increased trade, and communication on the world scale. Oil is still the most significant energy source, followed by coal that is in China and the less developed world still widely in usage. Last decade is features with lingering or closure plans of nuclear industries and strong advances and communication regarding renewable technology and implementation. Wind, solar geo and biofuel went with big steps in the most developed world forward-EU, USA, but made significant effort to diversify in some developing countries such as Brazil (ethanol in transport). The biggest energy consumers are interested in developing its owns technologies and further to implement in its country strategies.

Table 32: Consumption, total world 2012 mil ton oil equivalent

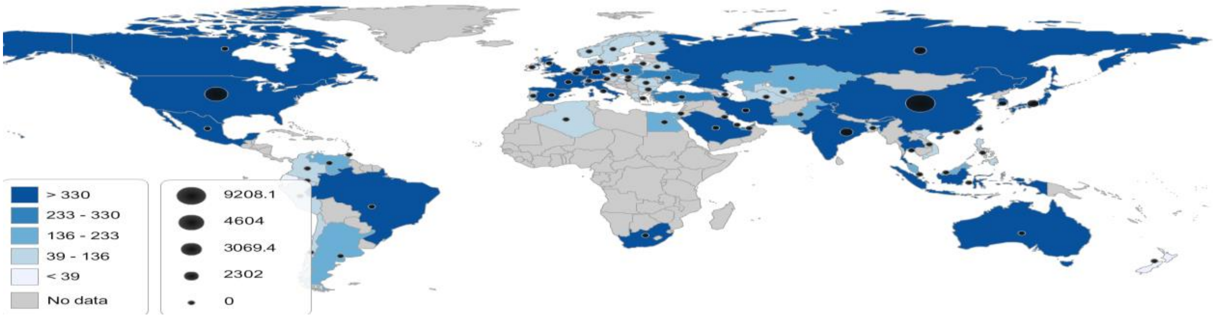
	Oil 2012 mil ton consumption	Natural Gas 2012 mil ton consumption/	Coal 2012 mil ton consumption	Nuclear Energy 2012 mil ton consumption	Hydro electric 2012 mil ton consumption	Renew ables 2012 mil ton consumption	**Total 2012 mil ton consumption/**
Total North America	1.016,78	819,96	468,47	206,90	156,31	57,01	**2.725,42**
Total S. & Cent. America	302,16	148,57	28,20	5,04	165,72	15,62	**665,31**
Total Europe & Eurasia	879,84	974,96	516,93	266,87	190,81	99,10	**2.928,51**
Total Middle East	375,80	370,60	9,86	0,32	5,14	0,14	**761,86**
Total Africa	166,52	110,53	97,51	3,22	24,14	1,40	**403,31**
Total Asia Pacific	1.389,43	562,46	2.609,12	78,06	289,02	64,15	**4.992,23**
Total	**4.130,53**	**2.987,06**	**3.730,09**	**560,39**	**831,14**	**237,42**	**12.476,63**



Picture 35

The big energy users from nonrenewable sources have the biggest increase in harmful gas emissions such as CO_2 gas. Total quantity of CO_2 that was released in 2012 was 34.466 mil ton. It is significant increase of 36% if compare with 2000 when was 25.300 mil ton CO_2 .The same increase in spending in primary energy was 33%.

CO_2 emission mil ton

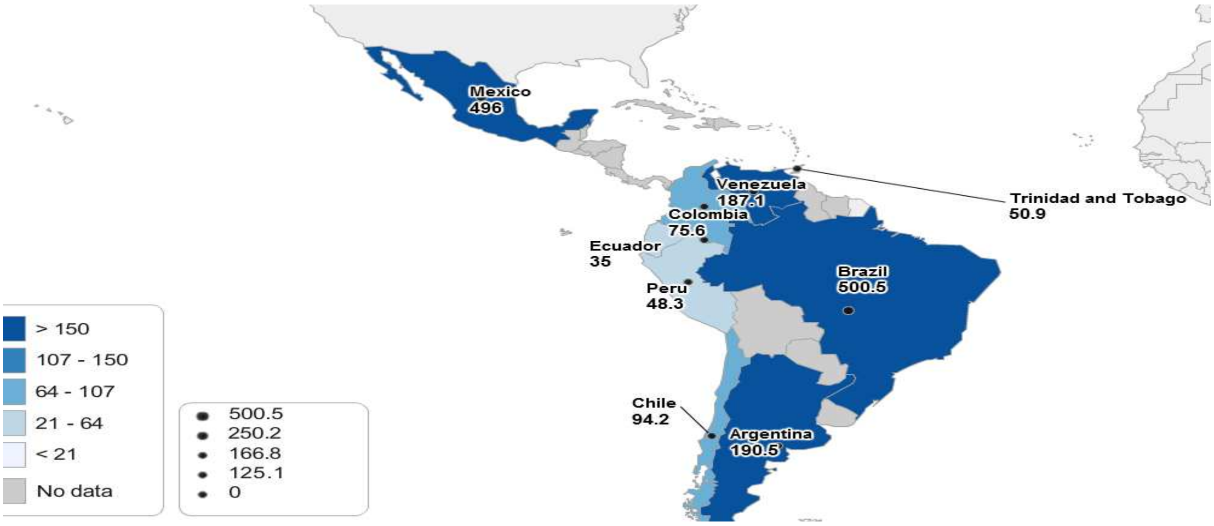


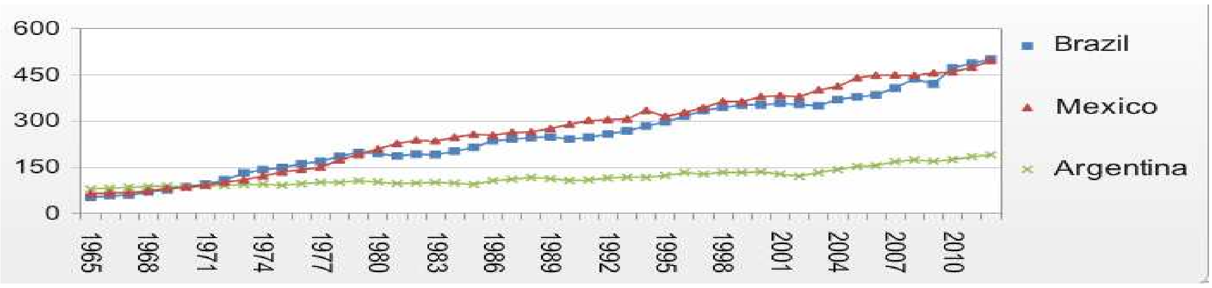
China had CO_2 emission of around 9.208 mil ton and USA 5.786 mil ton CO_2.

Emission CO_2 in Europe and Eurasia were 7.037 mil ton. The largest CO2 quantity were measured in Russia with 1.704 mil ton CO_2, after comes Germany 815 mil ton CO_2, Great Britain 530 mil ton CO_2.

CO_2 emission that was released in 2012 were measured in Canada and USA and it was around 6.405 mil ton. Canada is much smaller CO_2 (9 times less) polluter than its neighbor.

Middle and Southern America had around 1.884 mil ton CO_2 from which equally around 500 mil tn Mexico and Brazil.



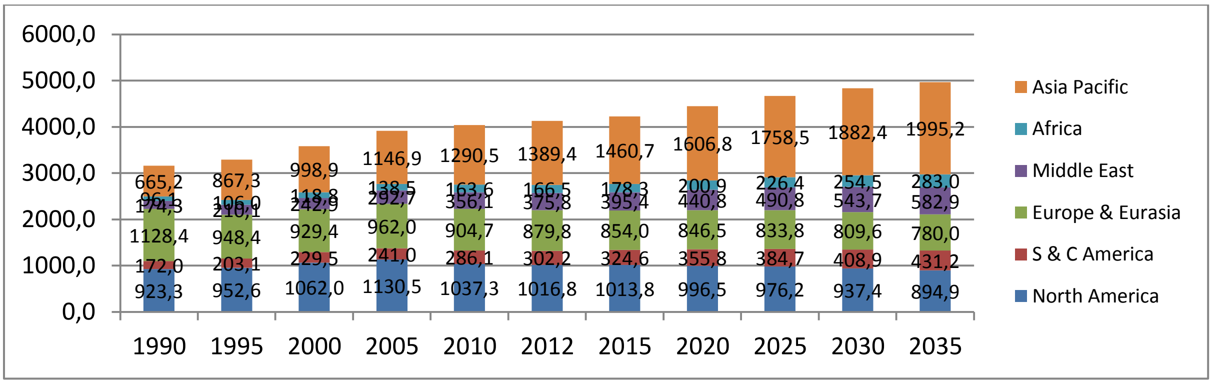


Absolute and biggest polluter in harmful emission of CO_2 is area in Pacific/Asia that had in 2012 around 15.919 mil ton CO_2. China is the country that had a strong GDP growth in the last two decades and its industrial development and increased quantity of cars on roads is observed in data of CO_2 where in 2000 3.429 mil ton CO_2, and in 2012 9.208 mil ton CO_2.

4.1. Increase of supply (BP)

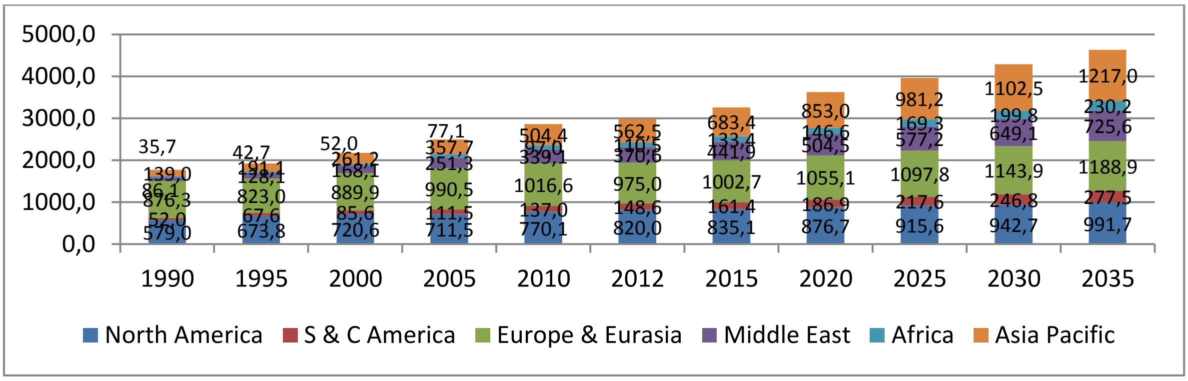
Institutes, energy companies, Government bodies, consumers and many other participants on market are trying to establish the best possible supply /demand structure in near future in order to increase its own energy pricing policy and contribute to efficiency. Although basis is current consumption, reserves, population growth, GDP/capita it is hard to establish right energy mixture as well as price that is going to be present in mid long term energy plan. Many analyst starts form current situation and have some base to observe future consumption. Usually they take into account population number, GDP/capita, current energy picture, new legislative, technology etc. This picture, in addition, can be added with some government interventions- taxes, credits- to certain technologies, advances that can came up from current research centers. Each analyst or institution has its own methods and it is possible that certain deviation occur. By following consumption history so far, BP analyst made certain forecast plans that stretches to 2035. They think that the biggest increase will come in the area of Asia and Pacific in respect of oil, and Europe will rely more heavily on gas in times that come. This short overview presents one point of view and calculation method.

Consumption oil /oil products mil ton 1990-2035 BP Oil consumption 1990-2035 BP



Picture 36

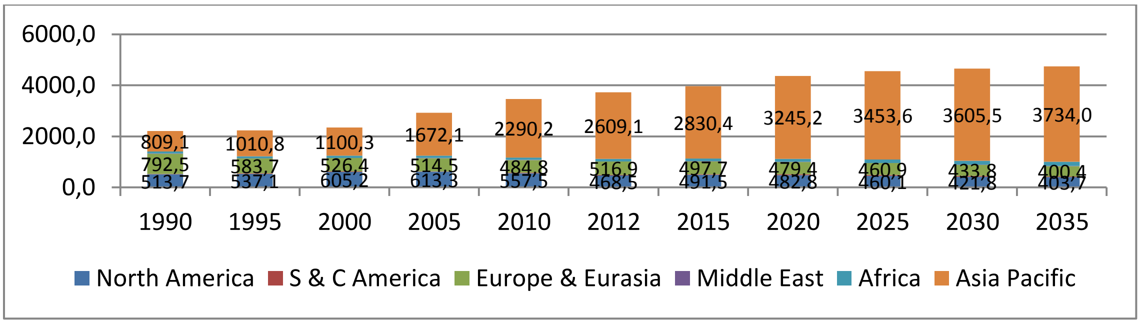
Gas consumption 1990-2035 mil ton oil equiv.



Picture 37

Asia and Pacific are still very much dependent upon coal - this trend is likely to stay according to some analyst. Further coal usage from 2.609 to 3.734 mil ton oil equivalent stresses this fact.

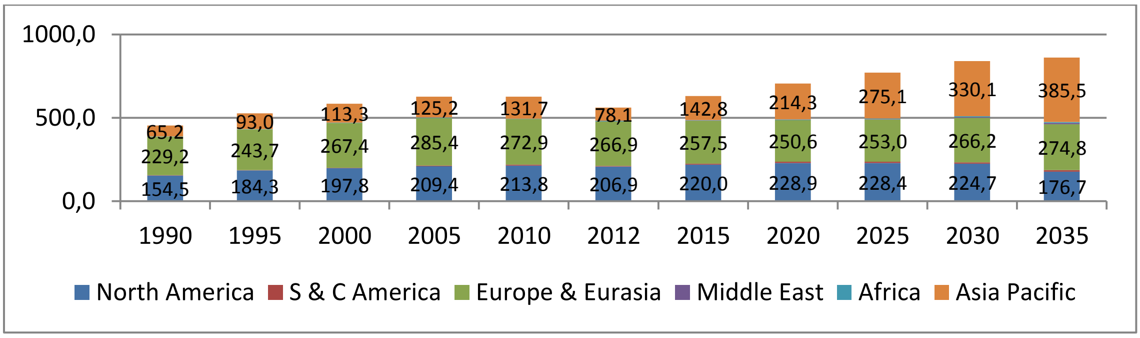
Coal consumption 1990-2035 mil ton oil equivalent.



Picture 38

Although NE is perceived as potential dangerous many countries still in its strategies have plans to build or invest in current nuclear energy capacity. It can be case for the region of Asia Pacific.

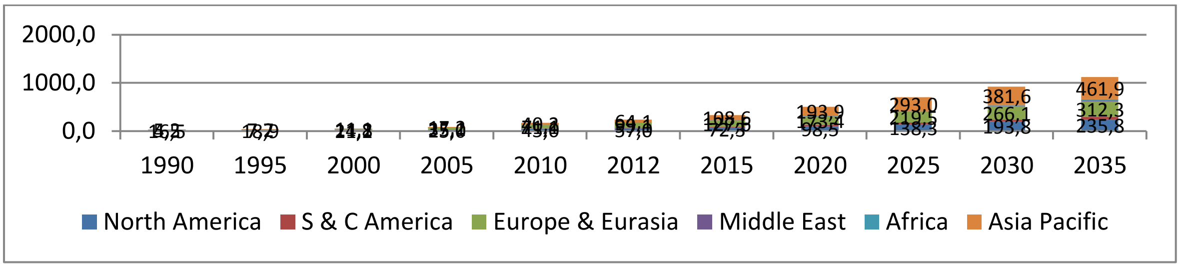
Consumption NE 1990-2035



Picture 39

The most significant feature is energy increase from renewables .While in 2000 it was less than 200 mil ton oil equivalent, in 2035 it is perceived to be around 1.500 mil ton oil equivalent on the world scale.

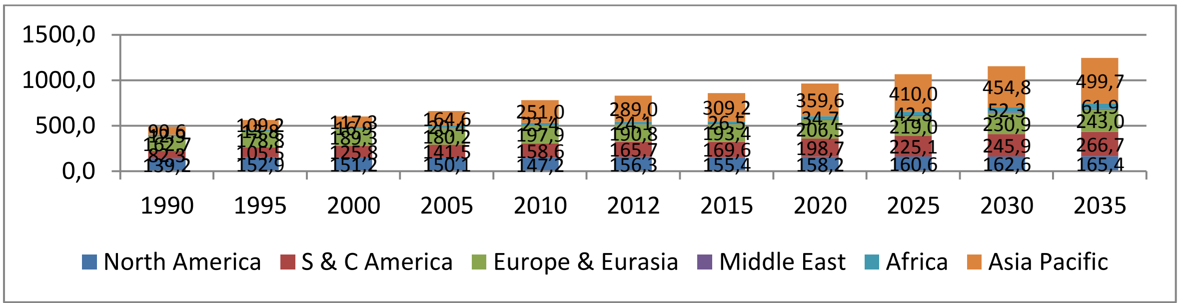
Total consumption of energy from renewable sources mil ton oil equivalent.



Picture 40

The most significant green resource comes from hydro energy and it further predicts growth from 800 mil ton oil equivalents in 2012 to 1200 mil ton oil equivalent in 2035.

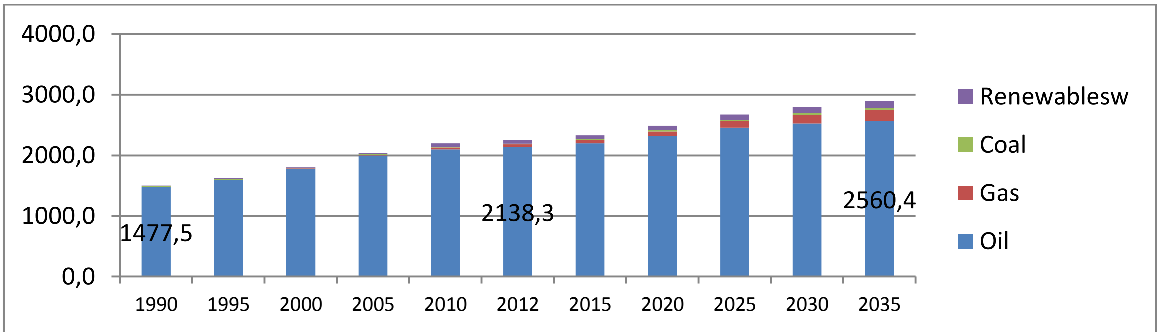
Total consumption of hydro energy 1990-2035, mil ton oil equivalent. 1990-2035



Picture 41

Oil is largely used in transport sector. With new technologies- electrical cars, hydro – it will decrease to certain extent its part in total used volume in period that comes.

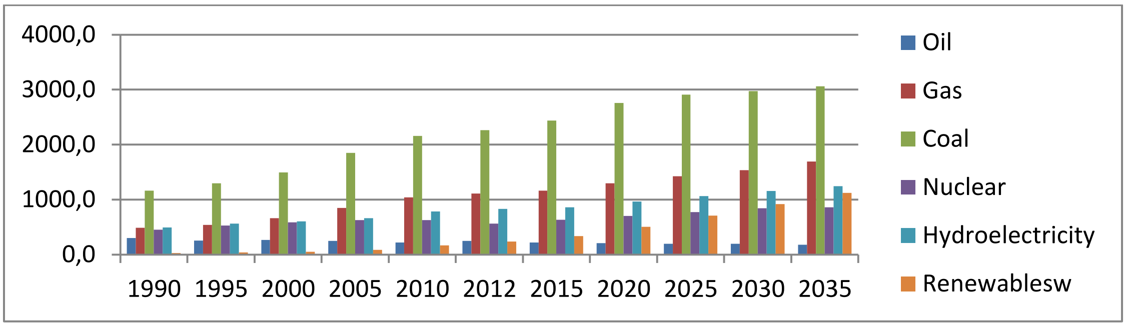
Consumption in transport sector



Picture 42

Electrical energy is produced using coal in Asia and this trend is likely to continue.

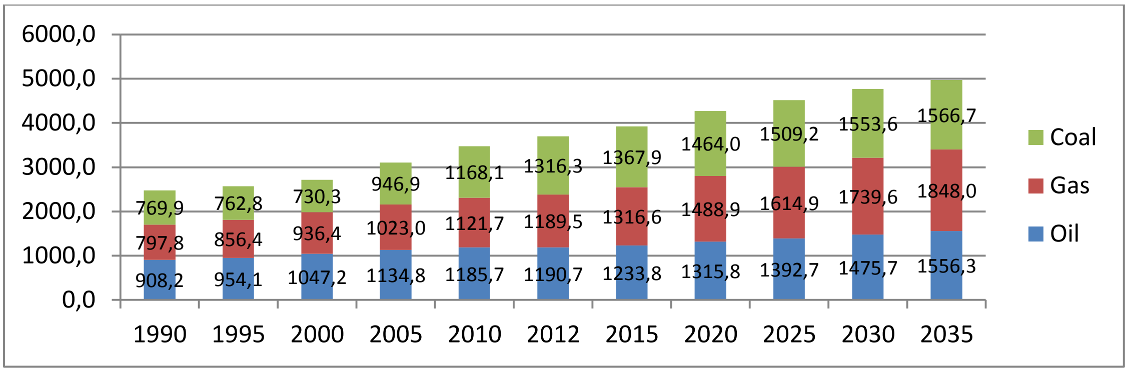
Electrical energy production –inputs 1990-2035



Picture 43

Industry is further heavily relied on coal, oil and gas and it needs grows from 400-5000 mil ton oil equivalent.

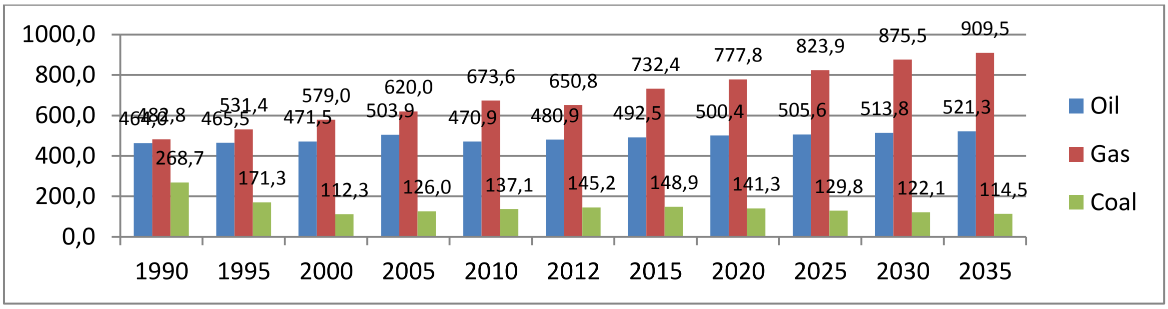
Energy consumption industry



Picture 44

Other sectors – households, heating, other- is based on consumption that grows from to 650-909 in observed period.

Consumption in order sectors

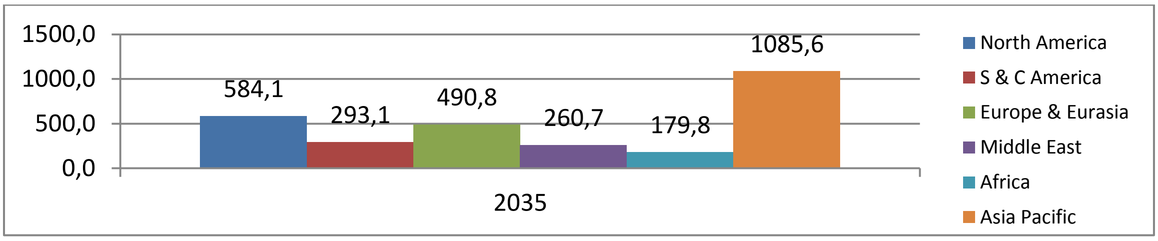


Picture 45

In the last observed period in year 2035 we can conclude that in the transport sector the biggest consumption is in area of Asia Pacific and almost half less in Northern America.

Transport sector will spend the most energy inputs in Asia Pacific region in times that come.

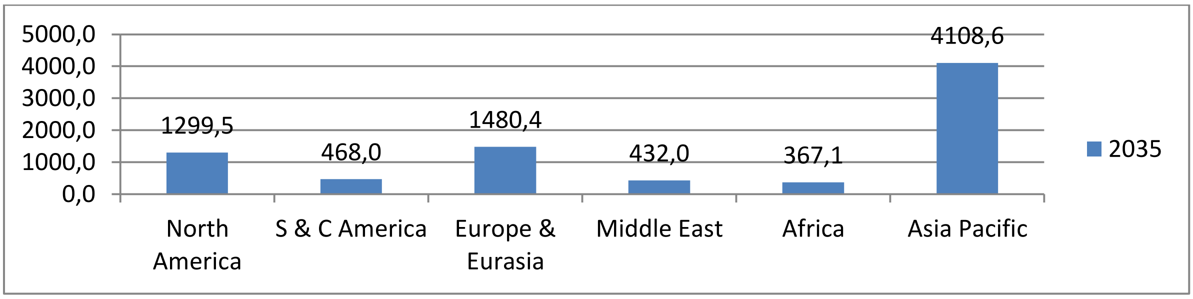
Consumption in transport sector BP forecast 2035 mil ton oil equivalent



Picture 46

Similar situation is observed for consumption of electrical energy (4108/1299 Asia/North America) for production and consumption of electrical energy with significant difference in usage between North America and Asia.

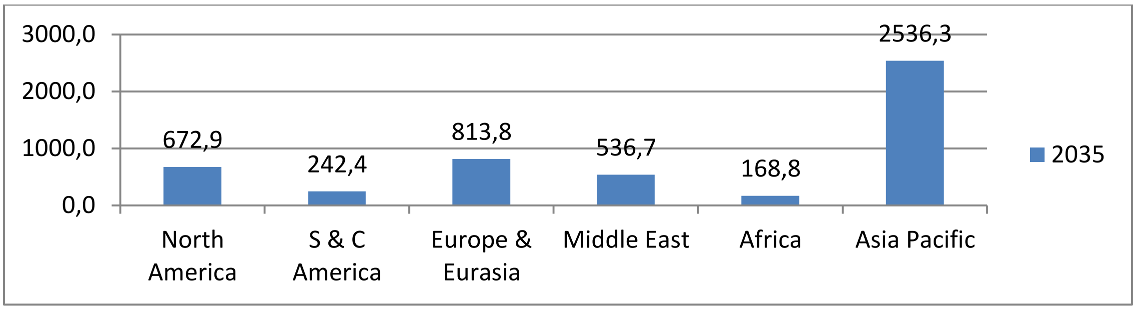
Electrical energy production mil ton oil equivalent.



Picture 47

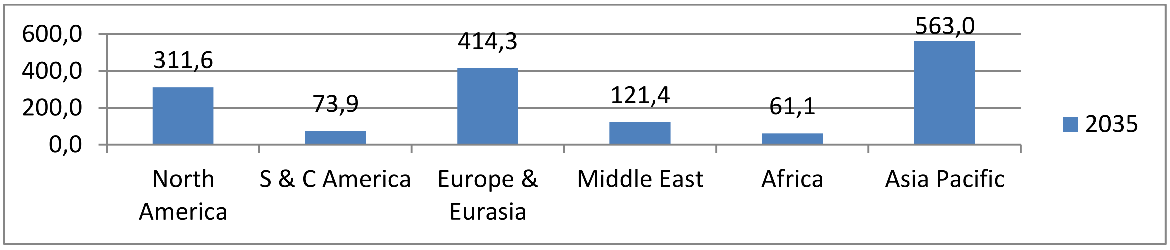
The same situation is visible for industry consumption almost 3,7 times more is forecasted to be used in Asia Pacific 2536/ 672 than in North America.

Energy consumption in industry mil ton oil equivalent.



Picture 48

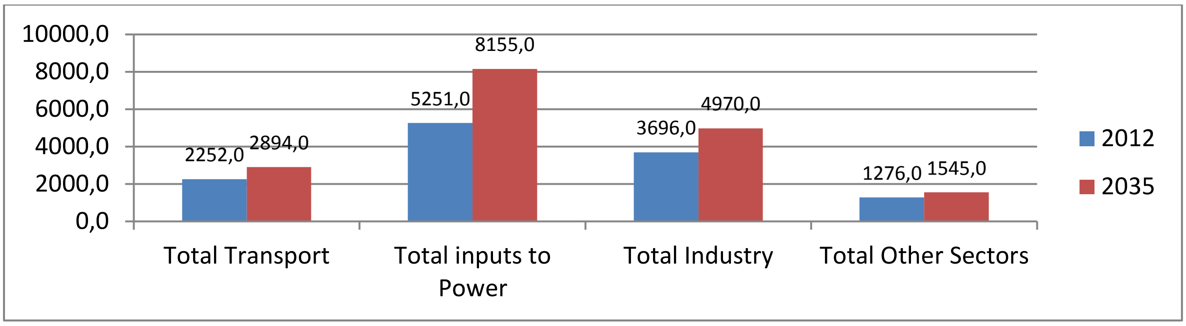
Consumption other sectors mil ton oil equivalent.



Picture 49

Total energy consumption is highest in the sector that is engaged in electrical energy production and this can further increase its share from 5251/8155)

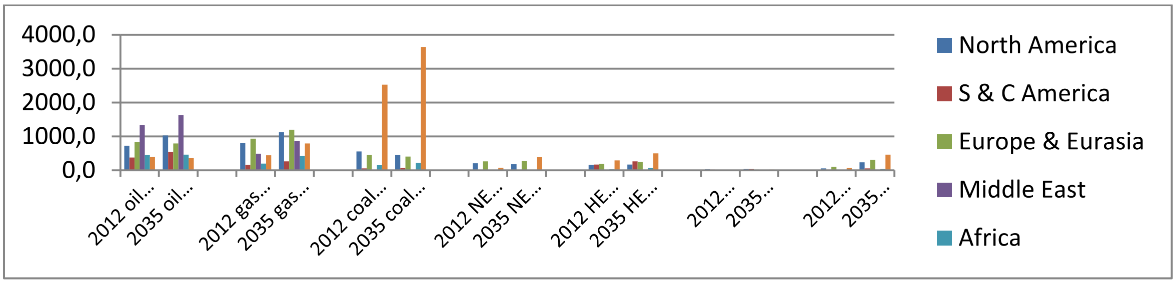
Total consumption 2012, 2035 BP forecast in mil ton oil equivalent.



Picture 50

The main fact to conclude is further coal share in total energy usage and further plans to increase coal consumption not just in Asia Pacific but worldwide.

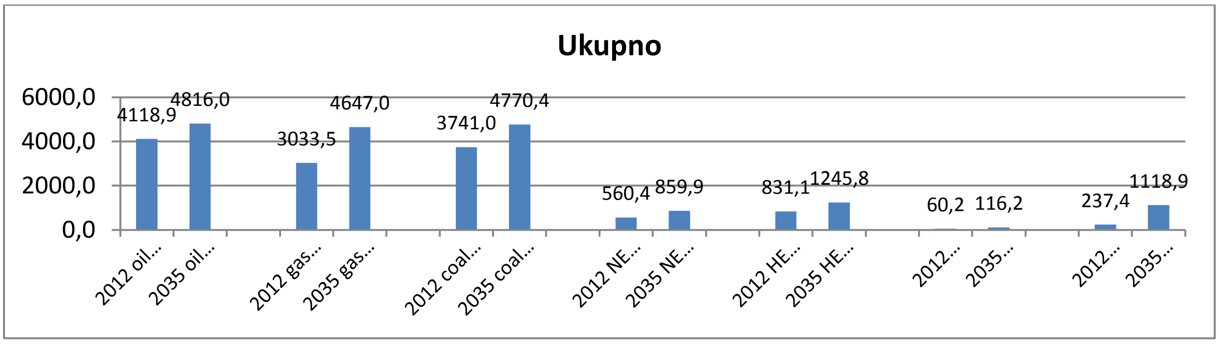
Production 2012/2035 mil ton oil equivalent. 2012/2035



Picture 51

The biggest jump in production will be made in area of renewable resources in period 2035/2012.

Production Total: 2012/2035 mil ton oil equivalent.



Picture 52

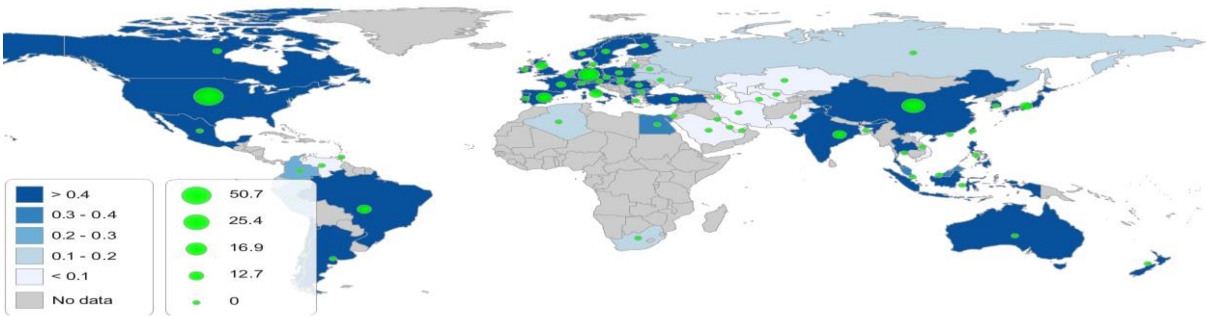
4.2. Renewable resources consumption (Without hydro energy)

Renewables present a great opportunity to mankind because it has no limit in quantities, and can be on one or another way be found everywhere in the world (sun, wind, geo, energy). Further important contribution to mankind is smaller negative impact on environment and reduction of harmful emissions currently present by oil/gas/coal usage. With technology advances and significant scientific steps in this area it is possible to make solid and ground plans to harness energy out of nature in this way.

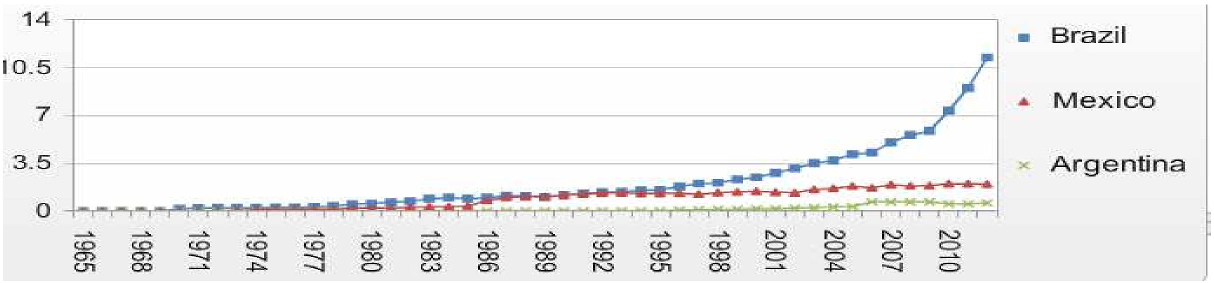
Increase in renewables was really impressive and the last ten years brought significant share of renewables in new investments and possibilities related to this part. It is enough just to compare numbers of consumption in 1965 where was 1,1 mil ton oil equivalent, with 2000 51,5 mil ton oil equivalent, or to further stress the last number of 237,4 mil ton oil equivalent, progress is visible.

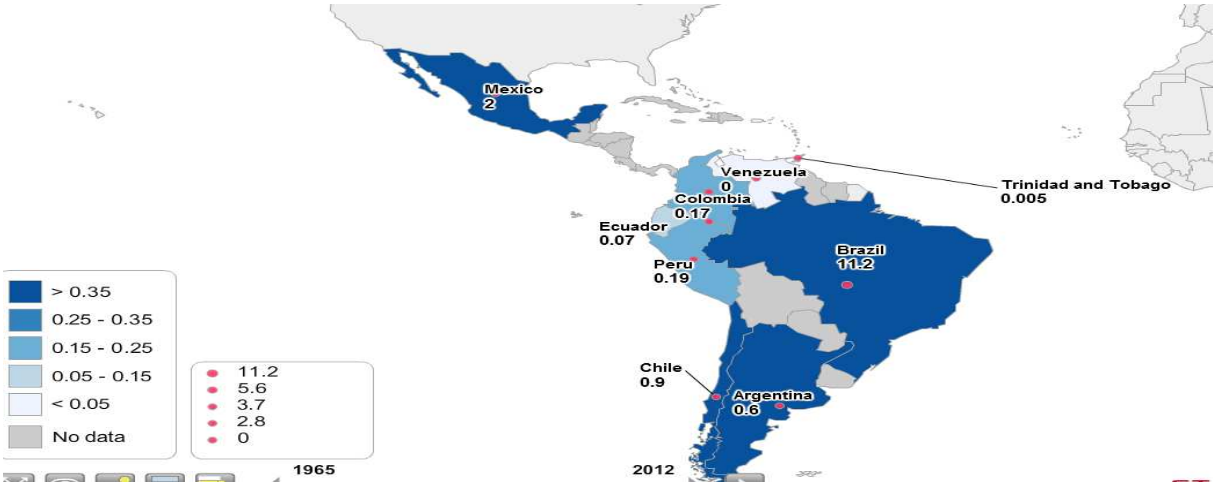
The biggest consumption has the riches countries and in that way OECD blocks uses 169,2 mil ton oil equivalents, and the countries that are not OECD only 68,2 mil ton oil equiv. It is important to stress that EU has consumption of 95 mil ton oil equivalent, while the countries of former Soviet Bloc only 0,6 mil ton oil equiv. This points further on conclusion that renewables advances in the countries with bigger GDP and lower quantities of reserves of classical energy resources. One of the richest countries in the world USA has 50,7 mil ton oil equivalent consumption of renewables.

Renewables (without hydro energy) consumption in mil ton oil equiv.



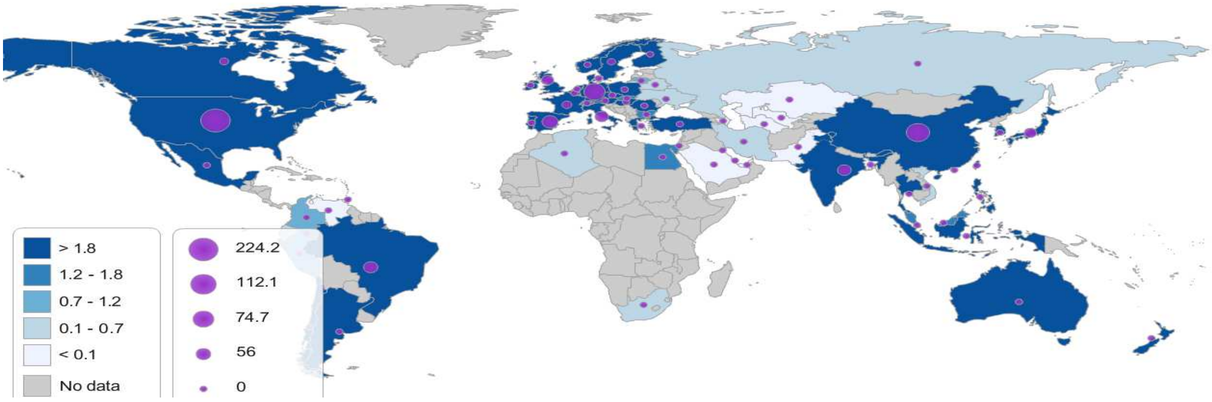
In the South America renewable energy consumption is around 17, 6 mil ton oil equiv. The majority of investments comes from Brazil that consumes 11, 2 mil ton oil equiv.





4.3. Consumption of energy from renewables (Without hydro energy) in TWh

Energy consumption from renewables (without hydro energy) was in 2012 1.049 TWh what is significant increase from 1965 when was only 5 TWh or from 1990 when was 125,9 TWh. with USA China and Germany as leading forces in the field.

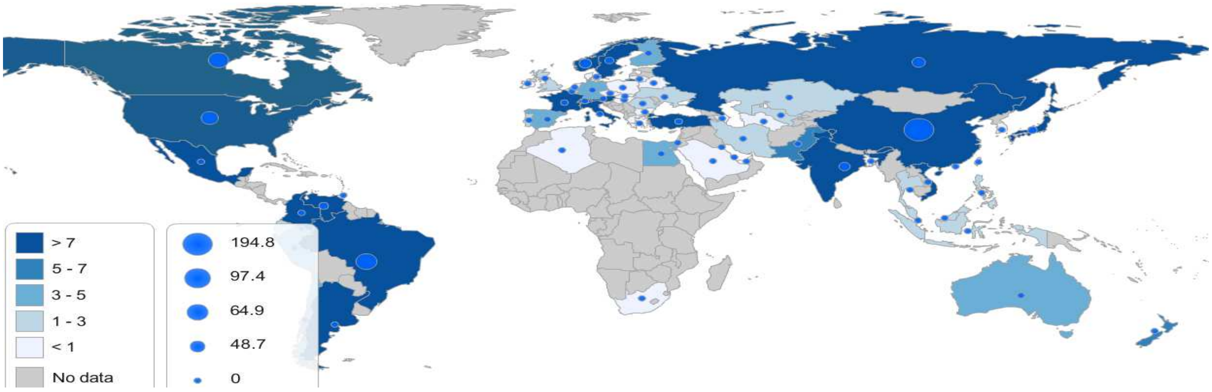


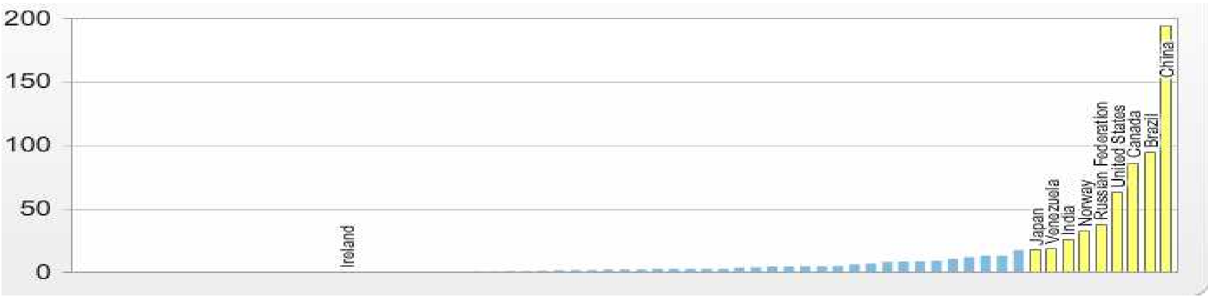
In Europe the biggest consumption was in Germany 114,9 TWh than in Spain 66 TWh Italy 48 TWh UK 37 TWh Denmark 14,9 TWh ,France 23,9 TWh, Finland 11,6 TWh. Consumption in Portugal was 13,9 TWh ,Turkey 7,2 TWh, Sweden 18,7 TWh.

4.4. Consumption from hydroelectric plants (mil ton oil equiv.)

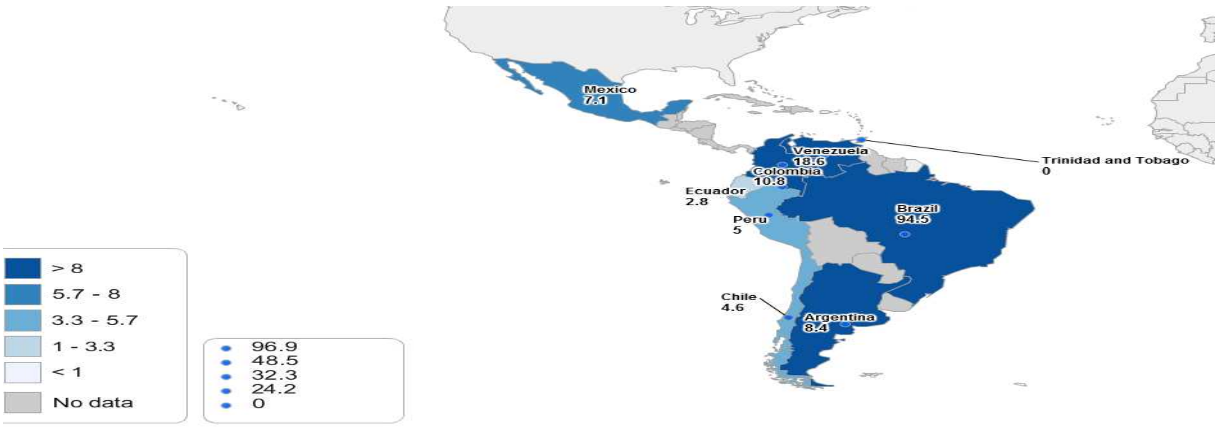
Besides non renewables sources of energy represented by oil, gas, NE, coal and other potential energy sources water resource is one of the leading energy sources in front of renewables. Total world consumption in 2012 was 831 mil ton oil equivalent what presents increase from 1965 when it was 209 mil ton oil equivalent, 1990 489 mil ton oil equiv. Countries of OECD had in 2012 consumption of 315 mil ton oil equivalent and countries that do not belong to this block 515 mil ton oil equiv. In EU consumption of energy from hydro sources was 74 mil oil equivalent, and in the countries of former Soviet bloc 55 mil ton oil equiv.

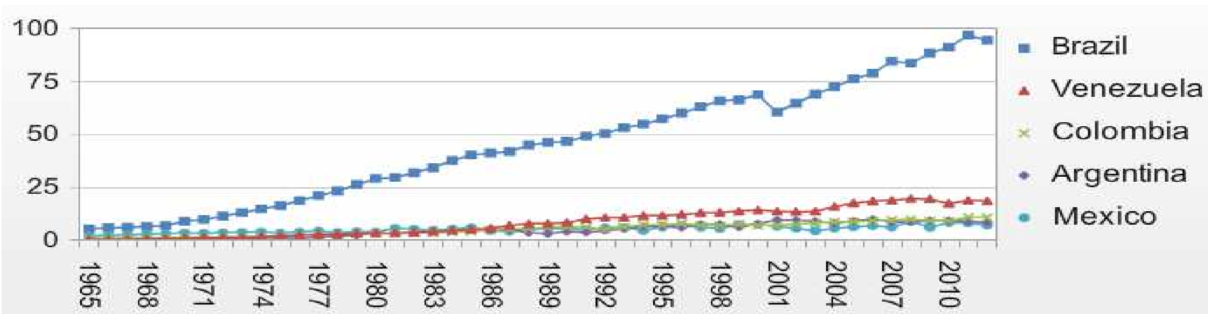
The biggest consumer is China with around 200 mil ton oil equivalent than Brazil 94,5 mil ton oil equivalent, Canada 86 mil ton oil equivalent, USA 63,2 mil ton oil equivalent, Russia 37,8 mil ton oil equiv.





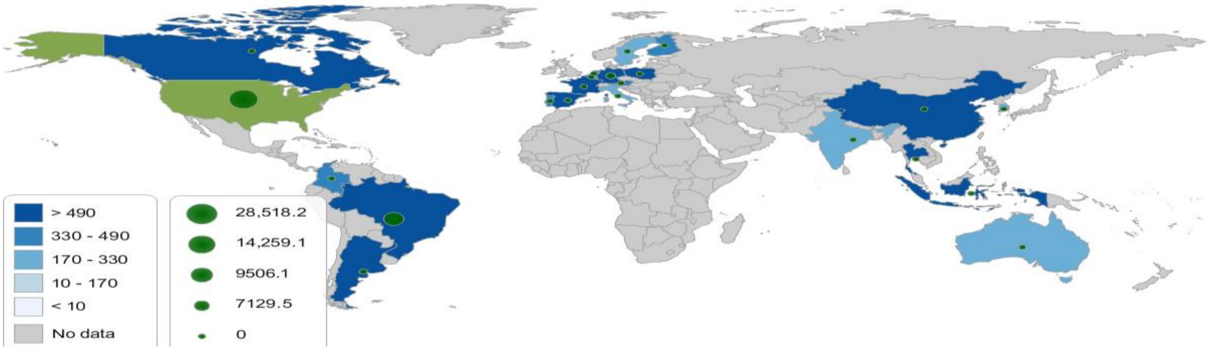
In South America consumption from water sources is 172,8 mil ton oil equivalent, from which Brazil has 94,5 mil ton oil equivalent, Argentina 8,4 mil ton oil equivalent, Colombia 10,8 mil ton oil equivalent, Mexico 7,1 mil ton oil equivalent.



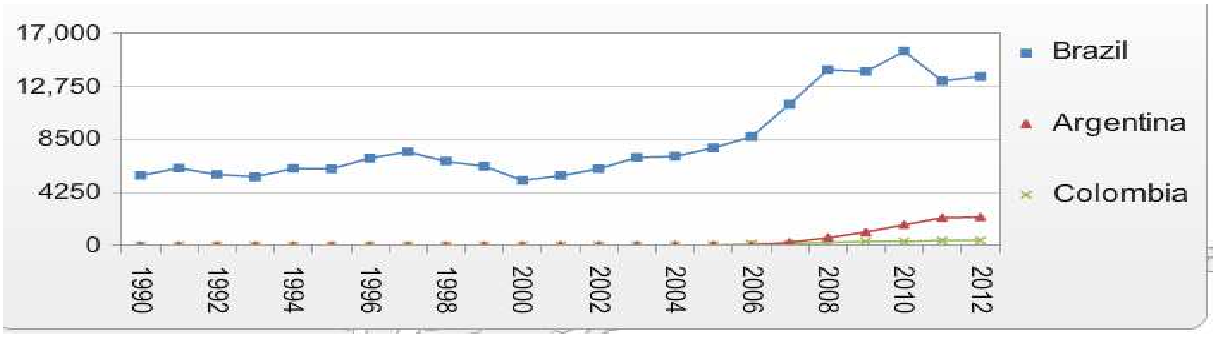


4.5. Biofuels production (thousand ton oil equiv.)

Biofuel consumption grew significantly after 1990 when was 7 094 thousand ton oil equivalent to reach in 2012 around 60.220 thousand ton oil equiv. The biggest consumers are the richest countries OECD that spend around 38.456 thousand ton oil equivalent, while countries that do not belong to OECD block has consumption of around 21.763 thousand ton oil equivalent. The biggest consumption of bio fuels is in region of Northern America with consumption of around 16.675 thousand ton, EU 10.022 thousand ton and Asia Pacific 5.173 thousand ton. Very small quantities of biofuels are used in Africa with around 23 thousand ton oil equivalent.

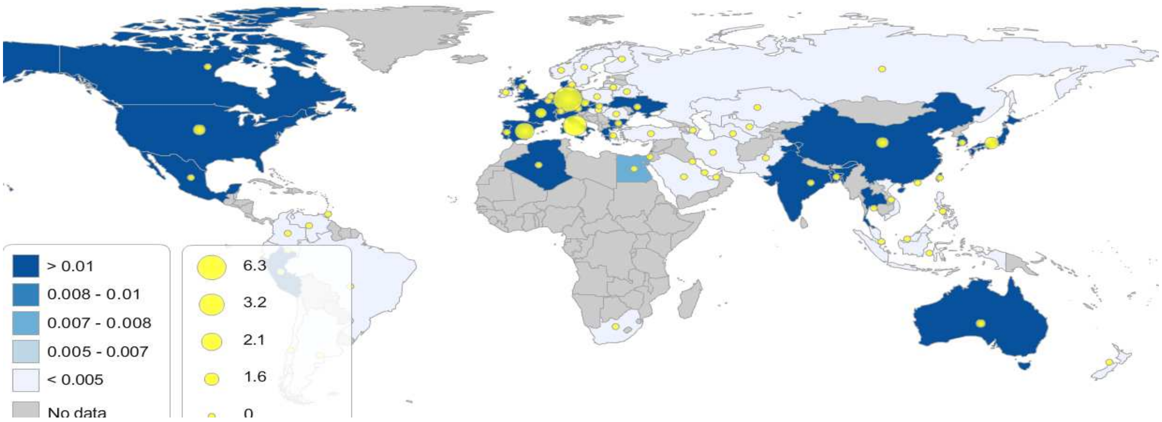


In South America Brazil is the biggest consumer of bio fuel with around 13.547 thousand ton oil equivalent yearly.



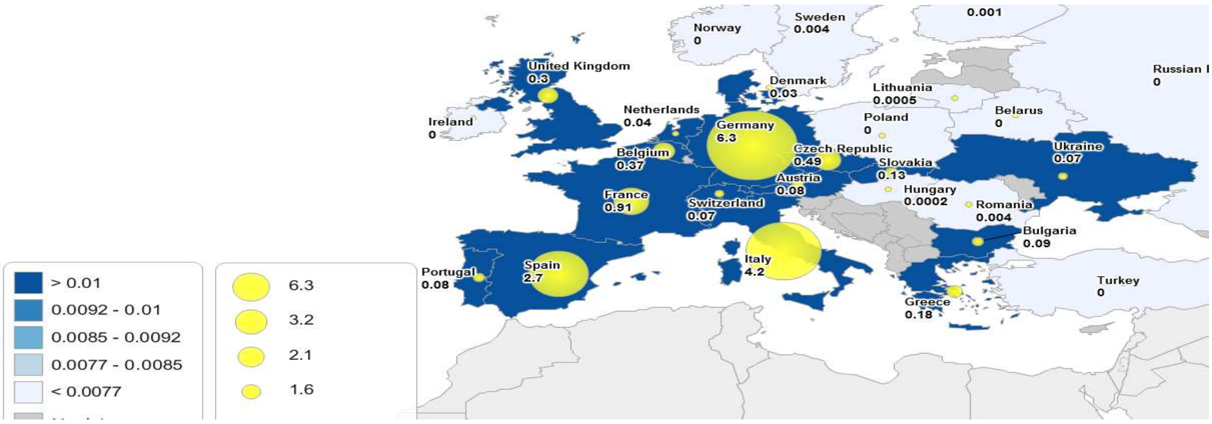
4.6. Consumption of energy from solar resources (mil ton oil equivalent)

Possibilities of solar energy consumption are immense and only after 2000 full potential are recognized and come with each year to importance. In 1996 it was only 450 MW of installed capacity, it increased to 2006 where reached 6.961 MW, and in 2010 40.415 MW, to be at levels of around 100.114 MW in 2012. This quantity of installed capacity is equal to 21 mil ton oil equivalent that was spent in 2012.



The most important region in the world is EU with 68.466 MW of installed capacity what is equal of around 16 mil ton oil equiv. Germany took and extreme effort and installed around 32.643 MW of solar panels what is around 6, 1 mil ton of oil equivalent consumption.

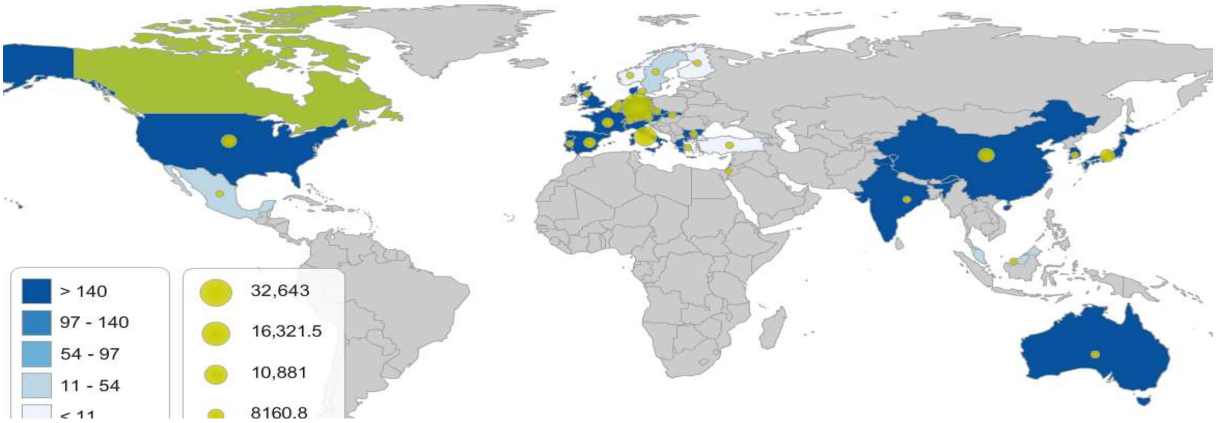
Besides Germany Italy has around 4, 2 mil ton oil equivalent, Spain 2, 7 mil ton oil equivalent from solar resources.



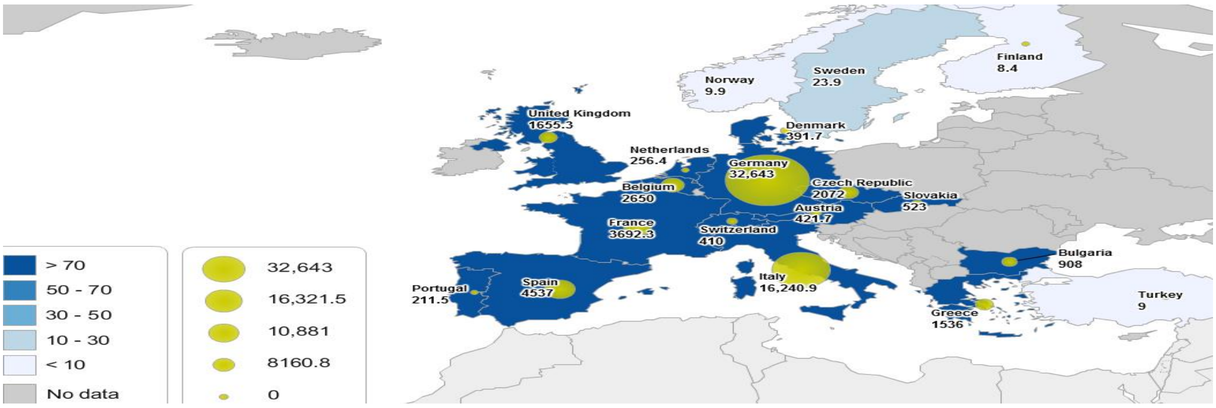
Production of solar panels and consumption of solar energy are new branches in economy to, and presents further possibilities in area of energy production, consumption, and work places.

4.6.1. INSTALLED SOLAR SYSTEM (PHOTOVOLTAIC PV U MW)

There are around 100.114 MW solar panels installed in the world. The most agile is Germany with 32.643 installed MW after comes China 8300 MW and Italy 16.240 MW.

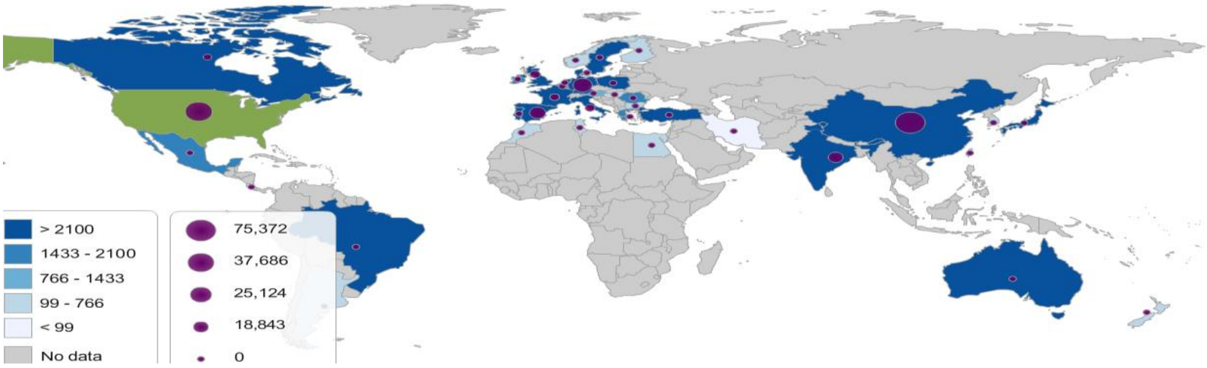


Germany and Italy advances in Europe where the total installed capacity is 68.466 MW.

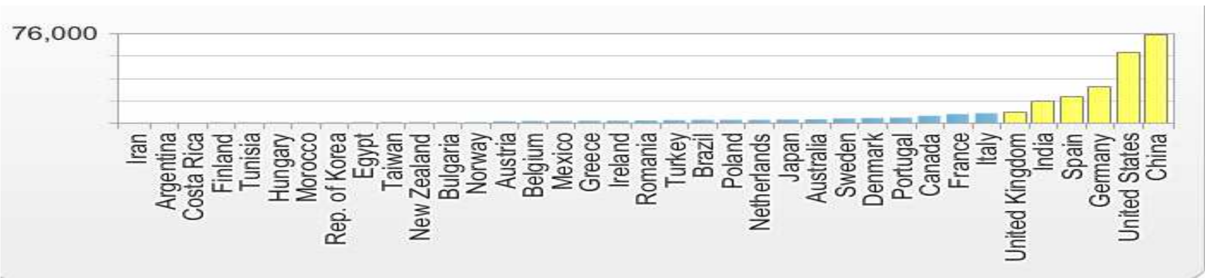


4.7. Installed capacity wind MW

Wind capacity and potential to harness this source was given a great support all around the world. This fact is underlined with data that says that in 1997 it was only 7.644 MW installed capacities , to be increased in 2000 to 17.934 MW, in 2006 74.086 MW, to be in 2012 around 284.236 MW. The Biggest installed capacity is in Europe 109.552 MW, after follows Asia Pacific Region 101.114 MW, and North America that have around 67.934 MW of installed capacity . This process is taking large steps forward so we can expect that other parts of the world will establish large and significant base in wind resources.



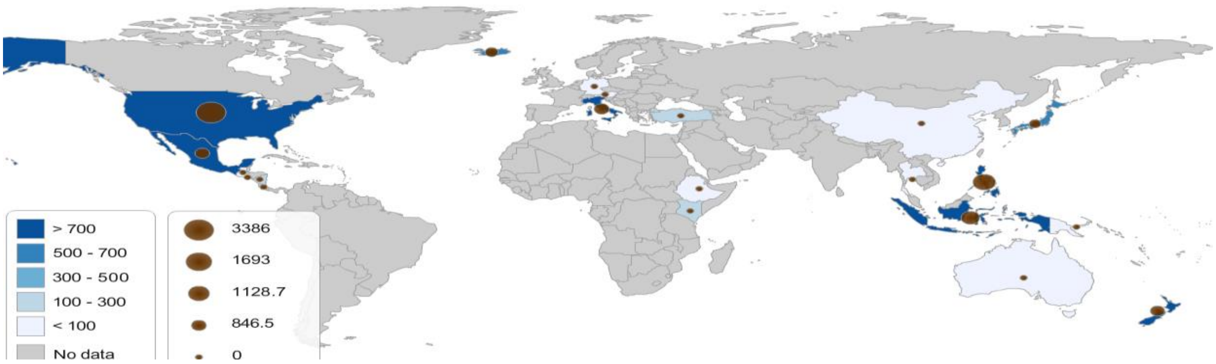
With 75.372 MW of installed capacity China is leader as the single country in harnessing the wind energy.

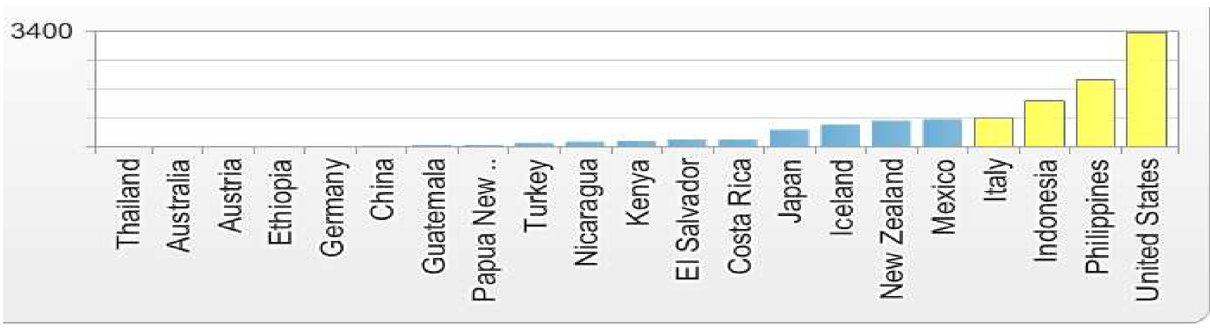


After 2006 countries of South and Middle America work on installing the capacity that has wind as the main source of energy. In that area Brazil stands up with 2.509 MW installed capacity, Mexico 1.512 MW capacity.

4.8. Installed capacity –geothermal energy (MW)

Total installed geothermal capacity is increased from 6.766 MW in 1995 to 11.145 MW in 2012. On the World Level. The biggest single installed capacity is in USA with around 3.386 MW, after comes Philippine 1.968 MW and Indonesia 1.339 MW.



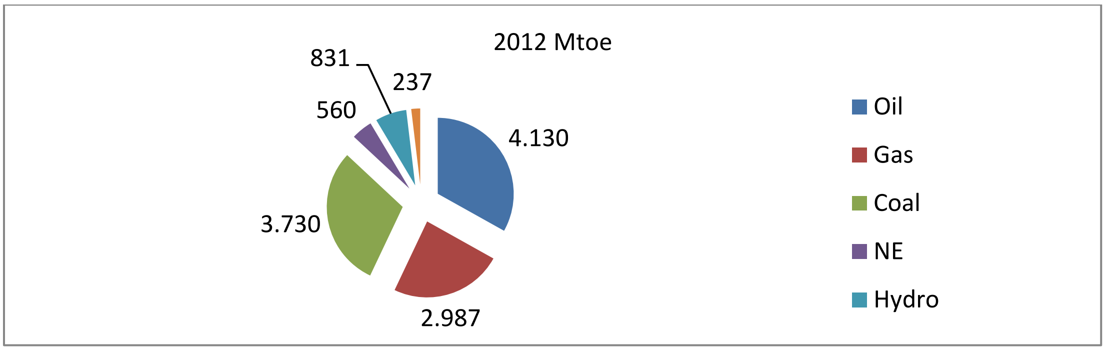


4.9. Renewables in short

Although renewables present large potential and possible impulse for further energy stability and security in the whole world it is still at the very beginning of its developing process and full capacity on the Planet Earth. Further advance is its potential to reduce harmful emissions, and impacts environment on more positive way than non-renewables (emissions, holes, wars etc.) If comparing data about consumption it is to be seen that total consumption is 12 475 mil ton oil equivalent, and only 2% is coming from renewables. Picture is colored with brighter point of view if hydroelectricity is taken as energy resource. In that respect world is having around 8, 5% of green energy in total energy supply.

Table 33: Energy consumption

	2012 Mtoe	%
Oil	4.130	33,11
Gas	2.987	23,94
Coal	3.730	29,90
NE	560	4,49
Hydro	*831*	*6,66*
Renewable energy	**237**	**1,90**
TOTAL:	**12.475**	**100**



Picture 53

Renewable energy is very different from each other where the most expensive technology is still to be found among solar potentials, and wind , bio energy are competitive with classical sources. It is to expect that solar technology price is going to decline with time, but this is still the long term period of time. The main obstacle for many is price for solar it is still to expensive in largest part of the world. Further to note countries with lowest income are the ones that have the most favorable conditions for solar technology. With usage of solar panels it is important to have enough solar days and to consider better energy storage than it is done so far. Wind energy can be important source of energy but also if some natural predispositions are reached, also facing problems with energy storage as downside risk.

So far is to be observed that very large potential lays in solar, but the countries such as Germany and USA have the largest installed capacity in their countries. Although some initiatives started a long ago to use Sahara as a resource some distribution, storage, financial considerations so far hindered growth in that respect.

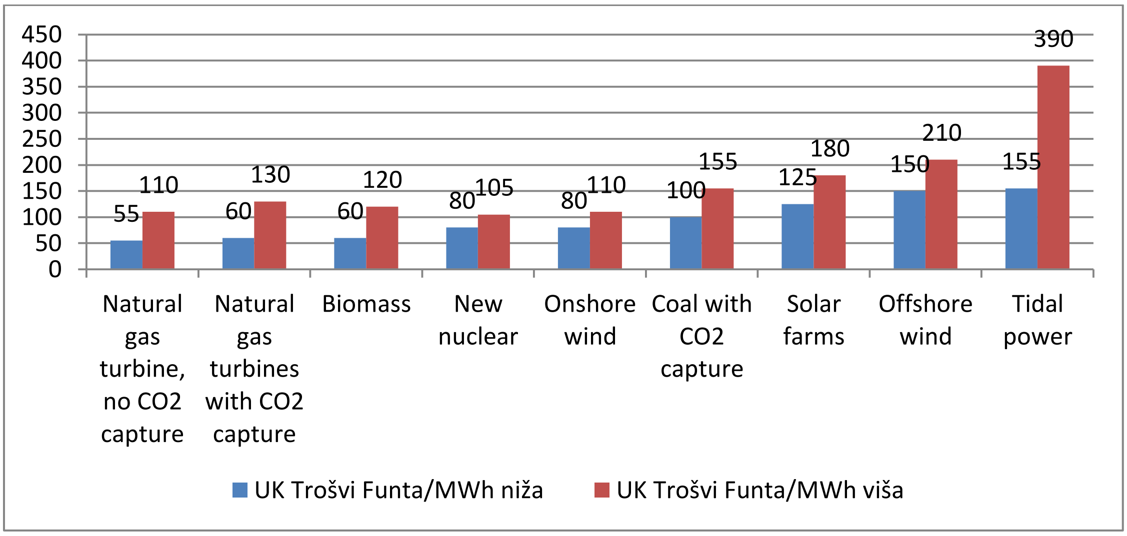
Table 34: Energy from different sources

	Thousand ton oil equiv
Biofuels	60.220,00
Geo	37.880,00
Wind	117.900,00
Solar	21.000,00
Renewables other	237.000,00
Hydro energy	831.000,00
TOTAL:	**1.068.000,00**

Table35: Potential of energy usage

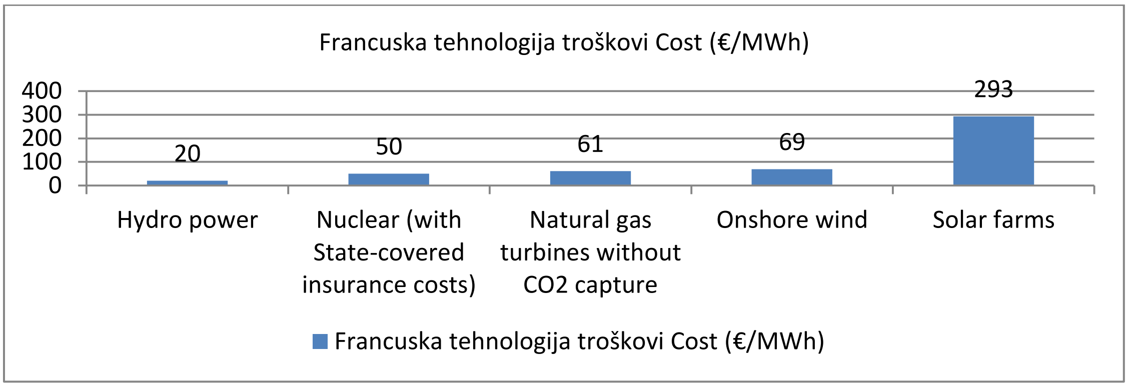
	Potential yearly usage TW
Solar	23.000,00
Wave	2
Geothermal	2
Hydro	4
Biomass	6
Wind	70
TOTAL	23.084,00
Current world production	16

Technology prices as given by Great Britain, Cost Pound /MW high /lower price



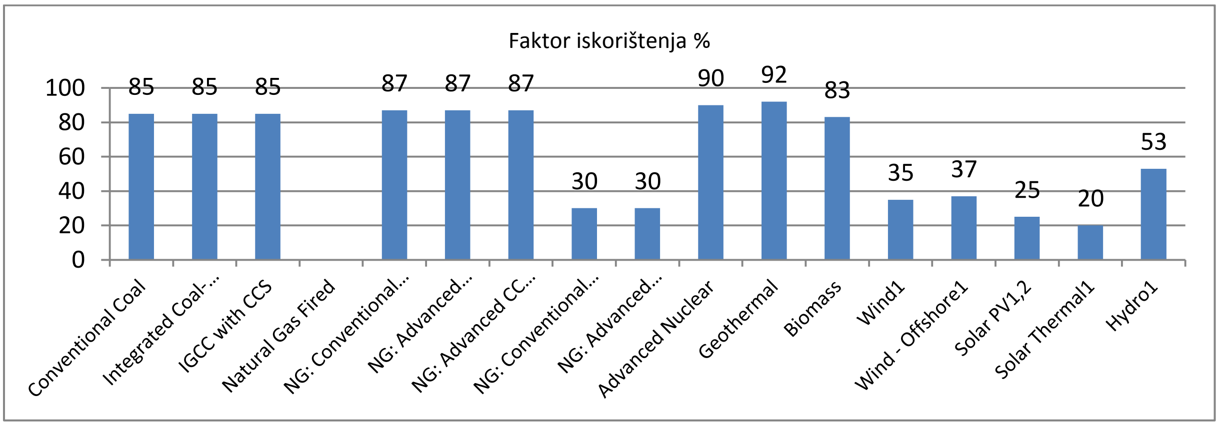
Picture 54

French technology costs €/MWh-changes with time- expected further to decrease



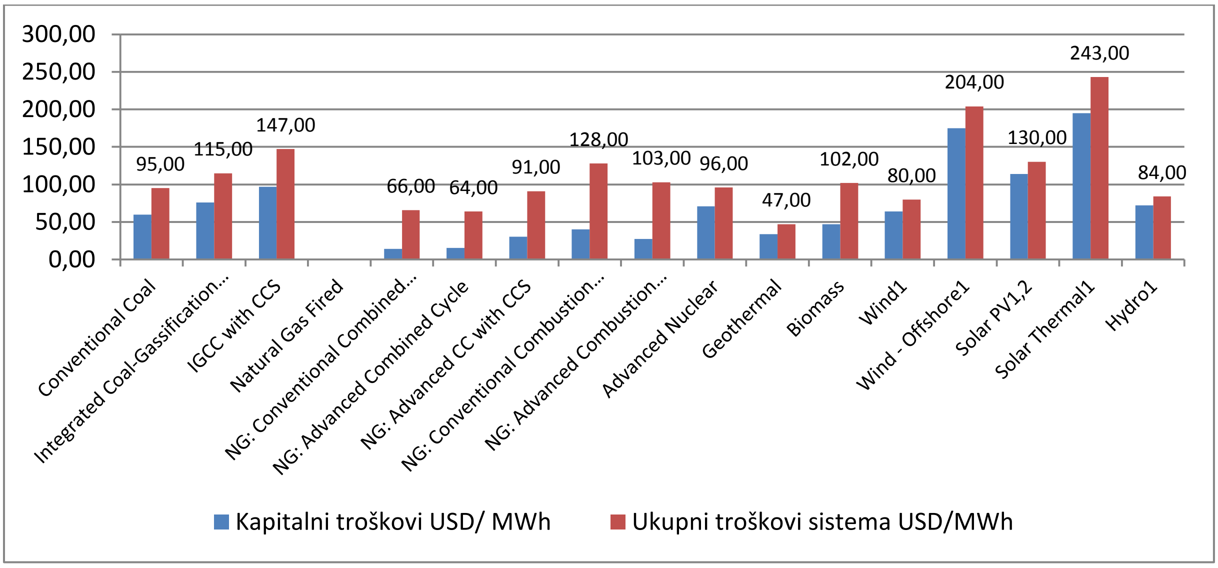
Picture 55

Capacity usage -possibilities



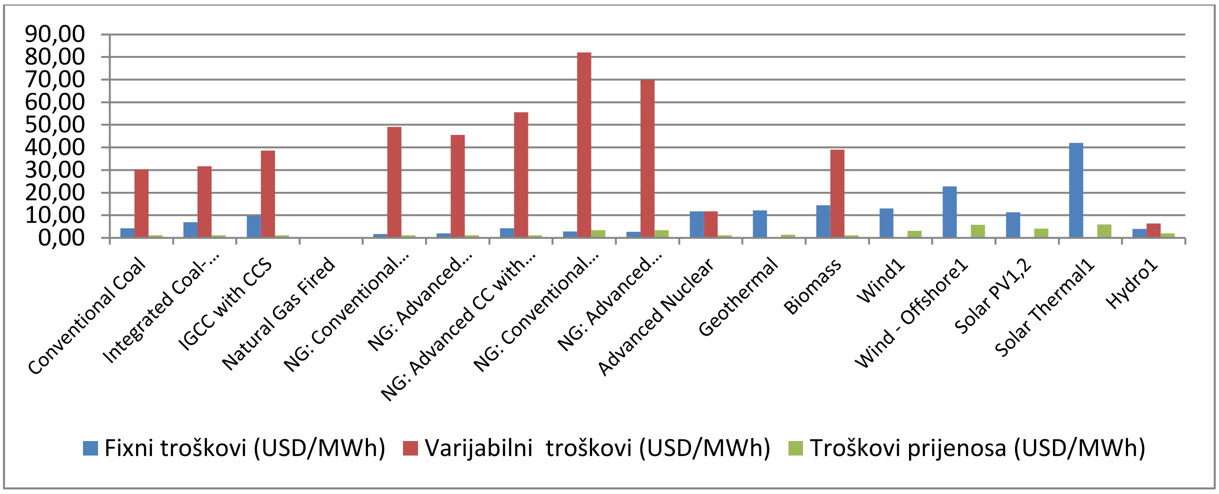
Picture 56

Capital costs- Total Costs USD/MWh



Picture 57

Fix, variable, Cost of transmission USD/MWh



Picture 58

4.10. Brasil renewables, ethanol

Brazil has done so far some steps toward production and implementation different renewables strategies. In its electricity production Brazil has 85 % production from renewables majority in form of hydroelectric sources. That high reliance on water can have a downturns while long periods of drought can cause various disruptions and more wide and vivid approach with new technological opportunities in order to secure, stabilize and diversify existing network is possible. This hydroelectricity represents ¾ electricity supply .With Government support others inputs such as biomass and wind are considered and supported. In that respect wind energy is used as hedge while wind potentials are highest in dry season. So far its potential of 143 GW is accomplished by 5GW infrastructure and long road to go still exist – majority of projects being situated along 4600 mile coastline. Another significant input to renewable diversification is in form of solar panels, and all solar related types of job (manufacturing, implementation ,further GDP growth) in that area. Brazil recognized potentials in telecommunication sector and rural remote areas -agricultural input that provide low cost and long term stability in supply of electricity in rural areas but total level is insignificant 0,01% of total. This low implementation can be gradually improved by government support, tax deduction , low income credits, jobs related to manufacturing with solar panel, more support and cooperation with powers such a s China , etc. Country has the highest solar incidence in the world. Another type of energy that was considered in Brazil is hydrogen whose production is around 920 000 ton per year, and that is used as direct fuel 1% or as input to refining, petrochemical fertilizers use.

Biomass is very popular and wide spread in form of using wood shaving, vegetal oil, agricultural left overs, garbage and while it can reduce negative emissions. With support of biomass production by using non used land, decreasing usage of forest as fuel input additional benefit in form of biodiversity preservation in line with CO_2 reduction is obtained.

Implementation of biomass is slowed due to cost related issues. While input in form of oil, coal, gas is competitive with wood for cutting growth, electricity production from left overs is still expensive and need to be supported and subsidies to certain extent.

Brazil is largely seen as successful ethanol producer and has a history of ethanol production from 1975. So oil crises in mid-70 –is lead to considerable growth of ethanol production from sugar cane, while country was endowed with significant arable land and good climate as input to production. Today results are visible in transport operation that is made with flux cars - ethanol is blended with fuel on increasing rate. It is a second largest producer around 454 the bbl. /d and the largest exporter of the fuel. This land potential has made Brazil in line with USA in ethanol production (the second from maize input).

Brazil works on increasing efficiency per hectare yielding 9 ths. liters per hectare, having around 380 ethanol plants with installed capacity of 538 mil metric ton of sugar cane per year. Typical costs per plant are $ 150 mil and need 30 the hectares. Throughout history country used sugar cane (27 bill liters) for 44 % sugar, 1% alcohol, 55% ethanol production.

Ethanol production started in the abandoned land areas and raised to 7,8 mil hectares what is share of total 276 mill hectares land. Low level of growth in employment 642/th to 982 Th in 2005 and better usage of land for agricultural project, forest afforestation can be additional input to think about further growth in diversifying inputs from renewables.

Table 36: Brazil and USA, ethanol production

Characteristic	Brazil	U.S.	Explanation, units
Input	**Sugar cane**	**Maize**	*Main cash crop for ethanol production, the US has less than 2% from other crops.*
Total ethanol fuel production (2009)/(2011)	6.578/ 5.573	10.750/ 13.900	*Million U.S. liquid gallons*
Total arable land	355	270	*Million hectares.*
Total area used for ethanol crop (2006)	3.6 (1%)	10 (3.7%)	*Million hectares (% total arable)*
Productivity per hectare	6,800-8,000	3,800-4,000	*Liters of ethanol per hectare. Brazil is 727 to 870 gal/acre (2006), US is 321 to 424 gal/acre (2003)*
Energy balance (input energy productivity)	8.3 to 10.2	1.3 to 1.6	*Ratio of the energy obtained from ethanol/energy expended in its production*
Estimated GHG emissions reduction	86-90%	10-30%	*% GHGs avoided by using ethanol instead of gasoline, using existing crop land (No ILUC).*
Full life-cycle carbon intensity	73.40	105.10	*Grams of CO_2 equivalent released per MJ of energy produced, includes indirect land use changes.*
Estimated payback time for GHG emissions	17 years	93 years	*Brazilian cerrado for sugarcane and US grassland for corn. Land use change scenarios by Fargione*
Total flex-fuel vehicles produced/sold	16.3 million	10 million	*All fleets as of December 2011. The Brazilian fleet includes 1.5 million flex fuel motorcycles.* *USDOE estimates that in 2009 only 504,297 flex-fuel vehicles were regularly fueled with E85 in the US.*
Ethanol fueling stations in the country	35,017 (100%)	2,326(1%)	*As % of total gas stations in the country. Brazil by December 2007. U.S. by July 2010. (170,000 total.)*
Ethanol's share in the gasoline market	50%	10%	*As % of total consumption on a volumetric basis. Brazil as of April 2008. U.S. as of December 2009.*
Cost of production (USD/gallon)	0.71 to 0.90	1.55 to 1.74	*2011 for Brazil (19¢ to 24¢/liter), 2011 for U.S. (41¢ to 46¢/liter)*

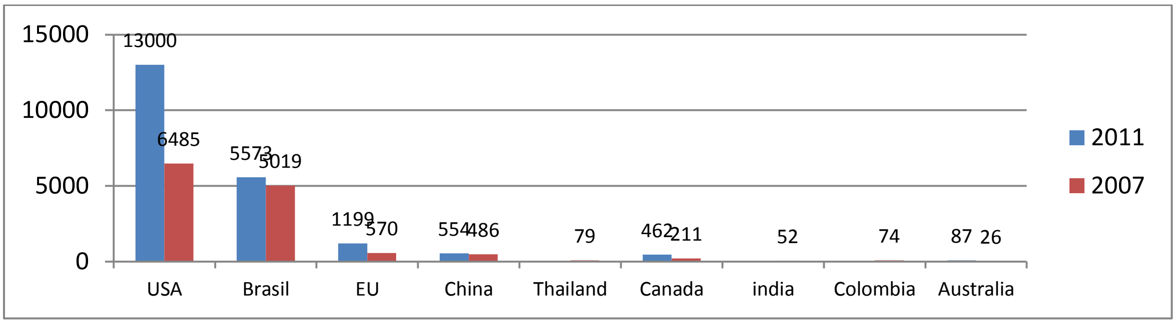
Source:Wikipedia.org

USA has experienced large increase in ethanol production in period 2007/2011 and Brazil stagnates in production. Further to note is large weather influence on end result what can further contribute to diversification strategy of renewables.

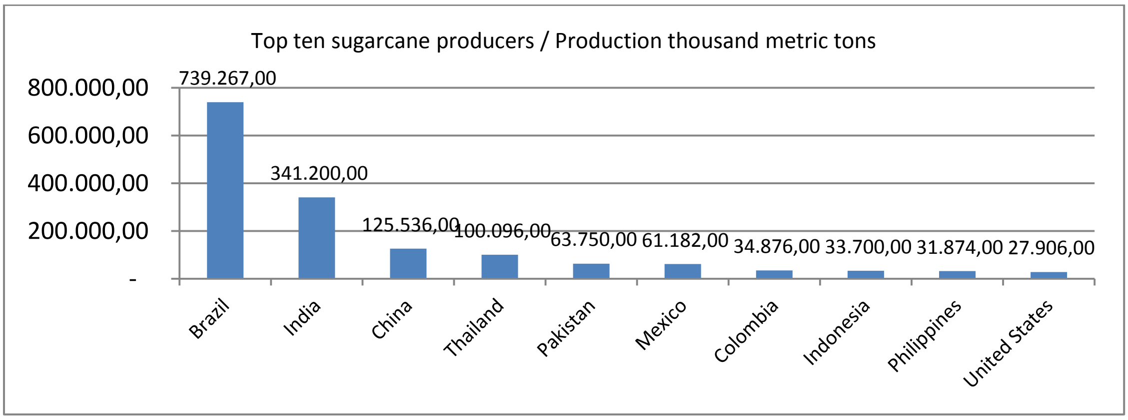
Table 37: Ethanol production mil liquid gallons per year

	2011	2007
USA	13.000	6.485
Brazil	5.573	5.019
EU	1199	570
China	554	486
Thailand		79
Canada	462	211
India		52
Colombia		74
Australia	87	26
World	**20.875**	**13.002**

Source: Wikipedia.org



Picture 59



Picture 60

Combination of resources in production and end goal result can be one of strategies each country can peruse. In that respect yield, calorific value, yield/ha, environmental consequences, price of investment and cost in process, increase of labor potentials are just a few observable factors to consider.

Table 38: Bio energy

Bio energy input	Yield/ ha	Fuel equivalence - l	Fuel equivalence (pro Area (l/ha)	Mileage (km/ha)
Plant oil (Rape oil)	1590 l	0,96	1526	23300+17600(*4)
Biodiesel (Rape oil)	1550 l	0,91	1411	23300+17600(*4)
Bioethanol (wheat)	2760 l	0,65	1794	22400+14400(*4)
Biome than	3540 kg	1,4	4956	67600
Btl (Biomass to liquid)	4030 liters	0,97(*5)	3909	64000

Table 39: Impact of fuel

Fuel	**Use impact**	**Emission**	**Fuel**	**Raw material**	**Effect**	**Emission g/kWh CO_2**
Diesel	Benchmark	291	Bensin	Benchmark	fossil	316
Palm öl diesel	With direct change of grassland	46	Ethanol	straw	Waste	24
BtL-Diesel	Without change of grassland	50	BioCNG	gulle	Waste	86
Palmöl diesel	Indirect land use change of grassland	112	Ethanol	Sugarcane	without changing land	111
BtL-Diesel	Indirect land change of fields	130	Ethanol	wheat	without changing land	138
Bio diesel	without land use change	144	Ethanol	Sugarcane	change of grassland	161
Palmöl diesel	without land use change	157	BioCNG	Corn	without changing land	184
Palmöl diesel	direct land use change in the rain forest	771	BioCNG	Corn	change of grassland	248
Bio diesel	direct land use change of the field	265	Ethanol	Sugarcane	change of Savanna	449

Table 40: Prouct,process,use

	Raw product	Process	Usage
Biodiesel	Rape Oil , Soja Oil , Palm oil, Alge, Jatropha	Oil toward refination	B100;B5;B7;TO B30
Clean Oil from plants	Rape Oil , Soya Oil , Algen	Pressure vs.Raffination	P100 in Agriculture; PKW
Biomass to liquid	Cellulose-biomass	Synthase gas	Mixture
Hydrate Oil to fete	Other ol fets	direct in raffination process; hydro process	without problem to get H30
Bioethanol	Corn, wheat, sugar, algen, cellulose, cassava	fermentation, dehydration,destilation	Fuel in natural gas vehicles
Bio butanol	Sugar, Cellulose,		

Table 41: Product, process, use- biogas, biohydrogen

	Raw product	Process	Usage
Biogas (Biometahn)	Energy plants (Corn, Wheat, Suger ,Grass);Between fruits, Gulle, Organic waste	Anaerobe fermentable, organic material, Preparing material ,Biogas, Biome than, in Gas quality	As fuel in gas vehicles
Bio hydrogen	Other biomass	Realize of hydrogen ,gasification from Biomass	Use of fuel cells ,in internal combustion engine

Table 42: Product process use- ethanol, butanol

	Raw product	Process	Usage
Bioethanol	Wheat, Rye, Barley, Triticale, Corn, Sugar ,Cassava, cellulose, Algean	Fermentation, distillation, dehydration	E5; Standard OK, E10
Bio butanol	Sugar, Cellulose, Lignin	Anaerobe bacterially conversion	Use less problematic than Bioethanol;

Table 43: Characteristics of fuel, Bio fuel

	Biodiesel from Rape	Biodiesel from Palm oil	Biodiesel from Soya oil	Biodiesel from fatten	Biodiesel from Jatropha	Biodiesel from Rape	Btl	Hydriret e oile
Fuel equivalent	0,91	0,90	0,90	0,91	0,92	0,96	0,97	0,95
Calorific value (MJ/l)	32,65	32,36	32,36	32,68	32,90	34,59	33,45	34,30
Biomasses (t/ha)	3,50	20,00	2,90		2,50	3,50	15,00	
Biokraft (l/t biomass)	455	222,00	222,00		244,00	440,00	269,00	
Bio craft (l/ha)	1.592	4.440,00	637,00		610,00	1.539,00	4.028,0 0	2.857,0 0
l Calorific value (GJ/ha)	52	144,00	21,00		20,00	53,00	135,00	98,00
GJ/ha (neto)	38	75,00	20,00			35,00	114,00	35,00
€ / l Biofuel	0,78	0,63	0,70	0,79	0,39	0,70	1,05	0,80
€ / l fuel equivalent	0,86	0,70	0,78	0,87	0,43	0,73	1,08	0,84
€/MJ	0,02	0,02	0,02	0,02	0,01	0,02	0,03	0,02
€/GJ	24	19	22	24	12	20	31	23
Saving kg CO_2/l Bio fuel	1,9	2	1,6	2,6		1,9	2,5	1,9
Saving kg CO_2/l Calorific value	2,1	2,2	1,8	2,9		2	2,6	2
Saving t CO_2/ha	3	8,9	1			3	10,2	5,5
€/t CO_2	214	131	205	159		159	258	214

Table 44: Characteristics of fuel, ethanol

	Bioethanol from cereals	Bioethanol from Sugar Beet	Bioethanol from Sugarcane	Bioethan ol from Corn	Bioethan ol from Cassava	Bioethanol from Cellulose	Bioethan ol from rest
Fuel equivalent	0,65	0,65	0,65	0,65	0,65	0,65	0,65
Calorific value (MJ/l)	21,17	21,17	21,17	21,17	21,17	21,17	21,17
biomass (t/ha)	7	58	73	9	29	3	1
Biofuel (l/t) biomass	387	108	88	400	200	342	371
Biofuel (l/ha)	2531	6252	6381	3740	3700	985	223
l Fuel equivalent /ha	1651	4079	4163	2440	2414	640	145
yield GJ/ha	55	132	135	79	78	21	5
GJ/ha (neto)	52	120	116	40		18	
€/ l Biofuel	0,55	0,53	0,2	0,34	0,4	0,64	0,67
€/ l Fuel equivalent	0,84	0,81	0,31	0,52	0,61	0,98	1,03
€/MJ	0,03	0,03	0,01	0,02	0,02	0,03	0,03
€/GJ	26	25	9	16	19	30	32
Saving kg CO_2/l Bio fuel	1,5	1,5	1,6	0,5		1,6	1,9
Saving kg CO_2/l Calorific value	2,2	2,3	2,5	0,8		2,4	2,9
Saving t CO_2/ha	3,7	9,4	10,2	1,9		1,5	0,4
€/t CO_2	208	187	-30	182		248	227

Table 45: Biogas, Bio hydrogen

	Biogas	Bio hydrogen
Calorific equiv.	1,4	3,51
Heating value - MJ/l	50	120
biomass (t/ha)	45	15
Biofuel (l/t biomass)	79	90
Biofuel (l/ha)	3555	1350
l Calorific value / ha	4977	4739
Calorific yield (GJ/ha)	178	162
GJ/ha (net)	130	120
€/l Biofuel	1,05	3,12-4,44
€/l Calor value	0,75	0,89-1,26
€/MJ	0,02	0,026-0,037
€/gj	21,06	26-37
Saving kg CO_2/l Bio fuel	2,08	
Saving kg CO_2/l Calorific value	1,49	
Saving t CO_2/ha	7,4	
€/t CO_2	240	

Table 46: Biodiesel

	Biodiesel from Rape	Biodiesel from Palm oil	Biodiesel from Soya oil	Biodiesel from fete	Biodiesel from Jatropha	Biodiesel from rape	Btl	Hydriret e oil
Yield (GJ/ha cal ertrag/ha)	52/1450	144/4000	21/580		20/600	53/1480	135/3910	98/2730
Net energy yield GJ/ha	38,00	75,00	20,00			35,00	114,00	35,00
Yield/mark teil	7%	1%	2%	1%		2%		
Cost of production €/ GJ	24,00	19,00	22,00	24,00	12,00	20,00	31,00	23,00
Gas savings t/ha	3,00	9,00	1,00			3,00	10,00	5,50
Gas avoidance costs €/t	214,00	131,00	205,00	159,00		159,00	258,00	214,00

5. SOME NEW OPPORTUNITIES

5.1. Tourism

For tourist each place is different and brings something new but some long term strategy in different areas can be made and put a clear vision toward future developments. Simplicity and clear expectations are under each tourist offer which further strongly pushes toward excellence in each field.

For Brazil the first assocision is Rio De Janero and carnival. That can we put in primary position and start with exciting journey toward north. In that journey where sea meets land, past present and excellent coulinarishes and rest station interchange with travel on the other continent as well. To put a story in one journey , meet African animals, large number of natural parks, etc. can be an offer that do not last only in February but can be there though the whole year.

The second offer is in Amazon region. Waste area do not need to be a place of danger, problems that are related to deforestation or security but real challenge in exploring the wild, meeting old dances and customs of indigenous population, rest in beautiful lakes, have a trip with a boat and fish, enjoy excellence in boat journey etc.

The third possibility is related to natural parks in country, waterfalls, land marks, mounting region and can with beauty and right pricing and offer even challenge the other two more famous places to visit.

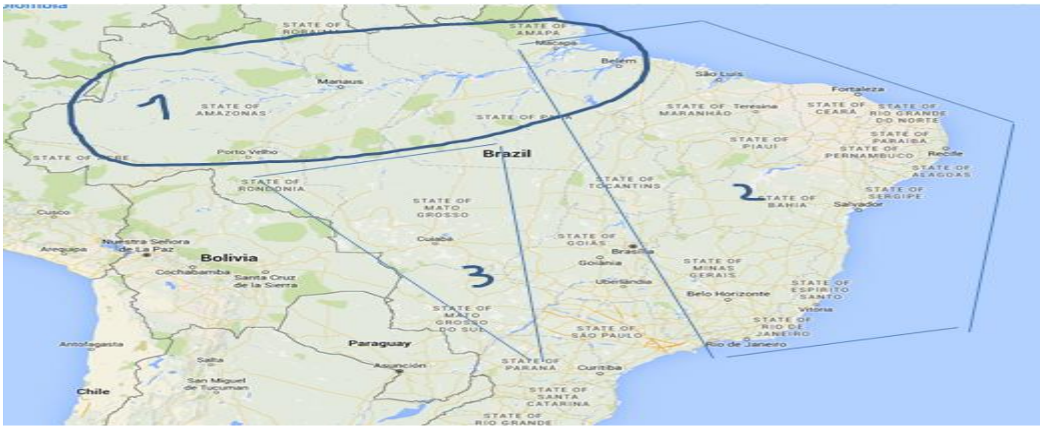
For tourist basic consideration are: *security, price-offer, number of days quality of hotel, variety of places and opportunities to visit or make, length of journey,*. The other important features that decide whether or not to visit a certain place is presented as follows:

Table 47: Tourist destinations

	Direct	Topics
1.	Security	No security treats, Good markings about danger – road, flooding, dangerous animals etc.
2.	Hotel/Hostel/Private	Price; Season, number of persons, Bed/Apartment; Availability; each reservation brings additional benefits ,Interne, telephone, connection to world, pool, attractions explanation, cuisine,
3.	Amenities	Carnival; Natural resorts; Museums, Past story of Pangea-Culture of America Africa along the way,
4.	Travel	Good roads, excellent markings (Portuguese, other international language; variety of gas station with hotels, rest stations, good restaurants along the way, amenities information about natural cultural sites;
5.	Other travel	Boat: along major rivers; along coast; Plane connection, easiness to come and rent availability of small planes.
6.	Medical	Fast and quality service even in the most distant areas of Amazon; telephone, plane connection etc.
7.	People	Many groups to connect, easy relation in connection to variety of activities: sport, culture, exploring,

Table 48:

	Indirect	Topics
1.	Business trip	Go business and prolonged with private exploring, trips, visit in order to make a new business or relax
2.	Good policy of environmental policy	Like to go because want to be part of community that is aware that Amazon forest and natural resorts need to be saved
3.	Some new place to visit	New possibilities- not just a carnival , but place where past meets present in African Amirian tourist offer or natural variety of forms
4.	Extra favouvarable packages good advertising	Excellent marketing and package that includes plan, many places, cuisine and extra service is always a n excellent way to attract tourist from North America ,Europe, Australia, Asia



Area 1:

Income = c_1+ b_1*number of tourist arrangment+b_2* number of days in boat+b_3 *number of days in Amazone+b_4*number of resorts places to vist+b_5*quality of hotel+b_6*exploring activities that include plants, animals observation+other

Area2:

Income= c_2+d_1*carnival time Rio+d_2*hotel stay in the journey to north+d_3*number of villages visited (Africa - America tourist offer)+d_5*days at sea with boat +d6* number of natural resorts visited+d_7*gas usage +d_8 *other

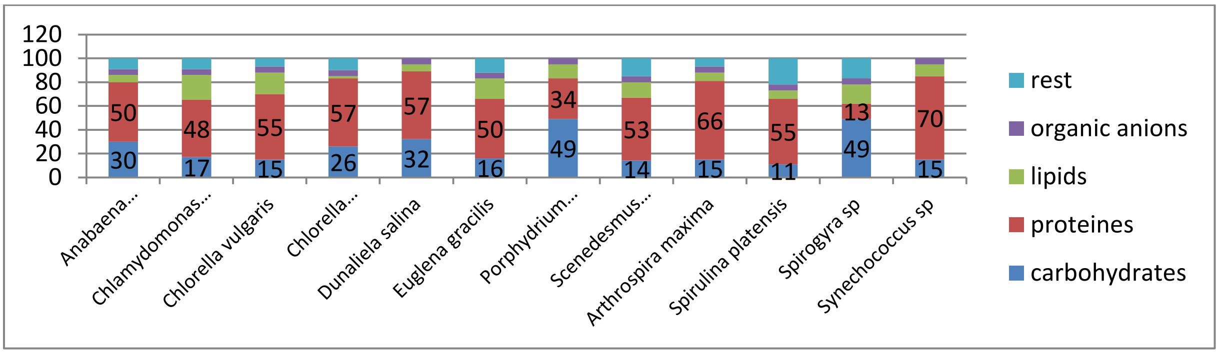
Area3:

Income= c3+e_1*hotel days+e_2*number of persons+e_3* natural park tickets+e_5*cuisine offer +e_6* visit to farms +e_7*plane rent+e_8 *boat trips along rivers +e_9 *other

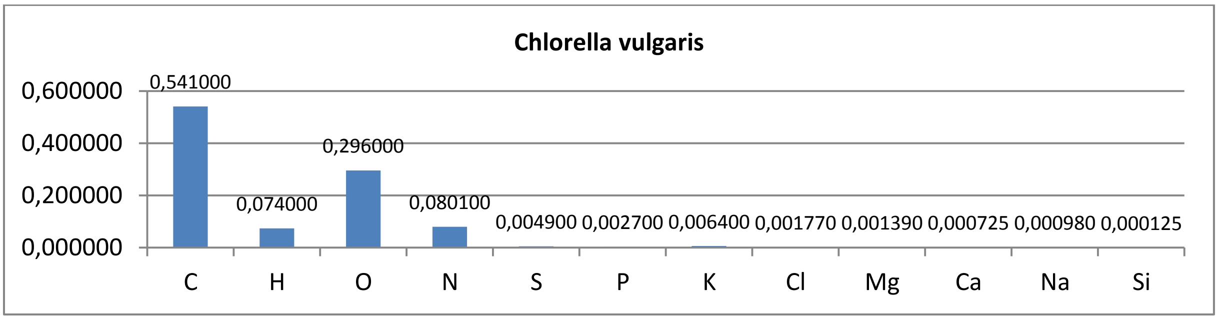
Area number 2

5.2. Algae Project /Open Pond and Tube

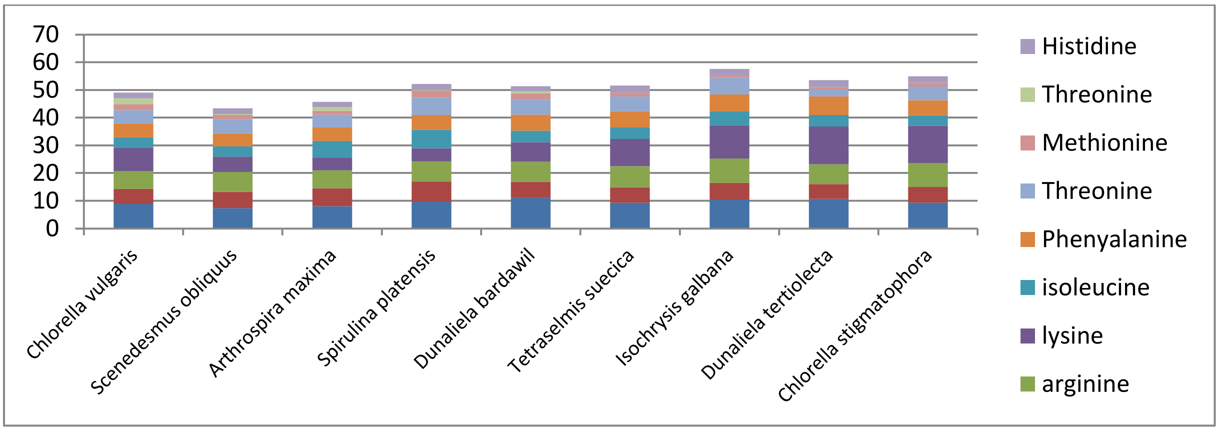
As part of new projects that can be as single process, part of manufacturing, or part of industry two algae production processes are observed. Algae have important medical, food, value and can be sue as energy resource as well.Some economic thinking for 2000 m^2 capacity is presented. It can further vary from state to state, technological advances, price competitvness, equipment sued etc.



Picture 61



Picture 62

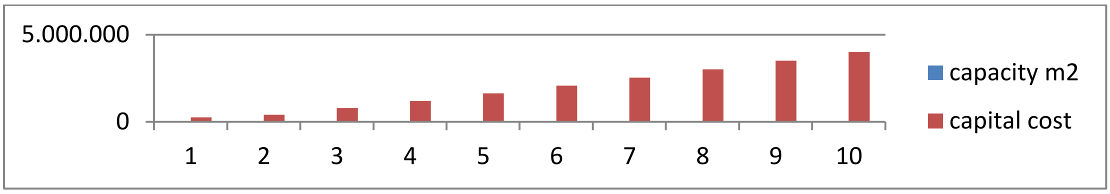


Picture 63

-Open pond

The first model that is represented is an open pond micro-algae production system. Inputs to this system are minerals from digest ate, CO_2 and low value heat from flue gas of a CHP biogas engine and solar global radiation.

Inputs are (Daylight 6000 GJ; water 2400 m^3; rainfall 1600 m^3; heat 1.800,000k kWh; el heat 4.000kWh; elec sparging 40.000 kWh; flue gas CO_2 12.000 kg; labor 1 1.200 hour; labor 2 60 hr; elec mixing 20.000 kWh ; labor 3 100 hr; electricity centrifuge 14 000 kWh) – Loss(lost biomass 600 kg; water evaporation 2 000 m^3; flue gas CO_2 6 000 kg; waste water 1200m^3)=Output(3.000kg biomass).



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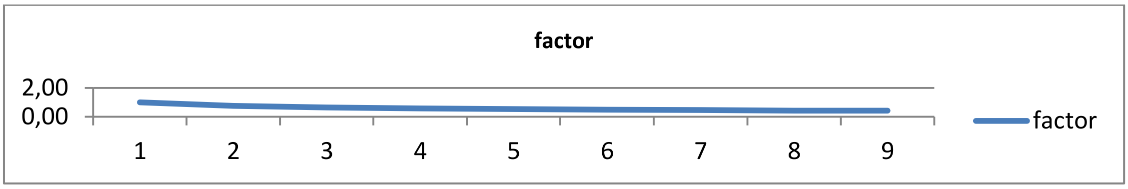


Picture 65

Algae open pond 1

Table 49: Cash Flow

	Production 2018	Production 2019	Production 2024
TOTAL CASH INFLOW	107.660,00	107.660,00	107.660,00
Inflow operation	107.660,00	107.660,00	107.660,00
TOTAL CASH OUTFLOW	325.824,48	53.717,84	53.717,84
Increase in fixed assets			
Operating costs	53.697,84	53.697,84	53.697,84
Income (corporate) tax	20	20	20
Financial costs	10.465,64		
Loan repayment	261.641,00		
SURPLUS (DEFICIT)	-218.164,48	53.942,16	53.942,16
CUMULATIVE CASH BALANCE	-272.164,48	-218.222,32	51.488,48
Local surplus (deficit)	-218.164,48	53.942,16	53.942,16
Local cumulative cash balance	-272.164,48	-218.222,32	51.488,48
Net flow of funds	-272.106,64		

Table 50: Discounted Cash Flow

	Construction 2017	Production 2018	Production 2019	Production 2020	Production 2026
TOTAL CASH INFLOW		107.660,00	107.660,00	107.660,00	107.660,00
Inflow operation		107.660,00	107.660,00	107.660,00	107.660,00
TOTAL CASH OUTFLOW	415.500,00	53.717,84	53.717,84	53.717,84	53.717,84
Increase in fixed assets	415.500,00				
Operating costs		53.697,84	53.697,84	53.697,84	53.697,84
Income (corporate) tax		20	20	20	20
NET CASH FLOW	-415.500,00	53.942,16	53.942,16	53.942,16	53.942,16
CUMULATIVE NET CASH FLOW	-415.500,00	-361.557,84	-307.615,68	-253.673,52	69.979,44
Net present value	-415.500,00	49.946,44	46.246,71	42.821,03	26.984,51
Cumulative net present value	-415.500,00	-365.553,56	-319.306,85	-276.485,82	-78.529,37
NET PRESENT VALUE	at 8,00%	4.664,27			
INTERNAL RATE OF RETURN	8,22%				
MODIFIED INTERNAL RATE OF RETURN	8,22%				
NORMAL PAYBACK	at 0,00%	8.70 years	2025		
DYNAMIC PAYBACK	at 8,00%	11.92 years	2028		

Table 51: Profit/Loss Account

	Production 2018	**Production 2019**	**Production 2024**	**Production 2027**
Sales revenue	107.660,00	107.660,00	107.660,00	107.660,00
Less variable costs	53.697,84	53.697,84	53.697,84	53.697,84
VARIABLE MARGIN	53.962,16	53.962,16	53.962,16	53.962,16
in % of sales revenue	50,122757	50,122757	50,122757	50,122757
Less fixed costs	29.433,33	29.433,33	29.433,33	27.183,33
OPERATIONAL MARGIN	24.528,83	24.528,83	24.528,83	26.778,83
in % of sales revenue	22,783603	22,783603	22,783603	24,873515
Financial costs	10.465,64			
GROSS PROFIT FROM OPERATIONS	14.063,19	24.528,83	24.528,83	26.778,83
in % of sales revenue	13,062592	22,783603	22,783603	24,873515
GROSS PROFIT	14.063,19	24.528,83	24.528,83	26.778,83
TAXABLE PROFIT	14.063,19	24.528,83	24.528,83	26.778,83
Income (corporate) tax	20	20	20	20
NET PROFIT	14.043,19	24.508,83	24.508,83	26.758,83
in % of sales revenue	13,044015	22,765026	22,765026	24,854938
RETAINED PROFIT	14.043,19	24.508,83	24.508,83	26.758,83
RATIOS				
Net profit to equity (%)	14,063016	24,543433	24,543433	26,79661
Net profit to net worth (%)	8,363909	12,737746	7,781688	6,80918
Net profit+interest to investment (%)	5,898635	5,898635	5,898635	6,440151

Table 52: Balance Sheet

	2017	2018	2024	2027
TOTAL ASSETS	415.500,00	386.066,67	314.955,15	392.981,63
Total current assets			105.488,48	267.314,96
Total fixed assets, net of depreciation	415.500,00	386.066,67	209.466,67	125.666,67
TOTAL LIABILITIES	415.500,00	386.066,67	314.955,15	392.981,63
Total current liabilities		218.164,48		
Total long-term debt	261.641,00			
Total equity capital	153.859,00	153.859,00	153.859,00	153.859,00
Reserves, retained profit brought forward			136.587,32	212.363,80
Retained profit		14.043,19	24.508,83	26.758,83
Net worth	153.859,00	167.902,19	314.955,15	392.981,63

2.nd Project - Algae tube

Table 53: Cash Flow

	Construction 2017	Production 2018	Production 2019	Production 2020	Production 2025
TOTAL CASH INFLOW	460.029,52	245.182,07	245.000,00	245.000,00	245.000,00
Inflow funds	460.029,52	182,070573			
Inflow operation		245.000,00	245.000,00	245.000,00	245.000,00
TOTAL CASH OUTFLOW	460.029,52	294.890,10	65.364,34	65.363,84	65.363,84
Increase in fixed assets	460.029,52				
Increase in current assets		726,264889			
Operating costs		65.363,84	65.363,84	65.363,84	65.363,84
Financial costs		8.800,00			
Loan repayment		220.000,00	0,504351		
SURPLUS (DEFICIT)		-49.708,03	179.635,66	179.636,16	179.636,16
CUMULATIVE CASH BALANCE		-49.708,03	129.927,62	309.563,78	1.207.744,58
Local surplus (deficit)		-49.708,03	179.635,66	179.636,16	179.636,16
Local cumulative cash balance		-49.708,03	129.927,62	309.563,78	1.207.744,58
Net flow of funds	460.029,52	-228.617,93	-0,504351		

Table 54: Cash Flow Discounted

	Construction 2017	Production 2018	Production 2019	Production 2020	Production 2025
TOTAL CASH INFLOW		245.000,00	245.000,00	245.000,00	245.000,00
Inflow operation		245.000,00	245.000,00	245.000,00	245.000,00
Other income					
TOTAL CASH OUTFLOW	460.029,52	65.908,03	65.364,34	65.363,84	65.363,84
Increase in fixed assets	460.029,52				
Increase in net working capital		544,194316	0,504351		
Operating costs		65.363,84	65.363,84	65.363,84	65.363,84
NET CASH FLOW	-460.029,52	179.091,97	179.635,66	179.636,16	179.636,16
CUMULATIVE NET CASH FLOW	-460.029,52	-280.937,55	-101.301,90	78.334,26	976.515,06
Net present value	-460.029,52	165.825,89	154.008,62	142.600,98	97.051,83
Cumulative net present value	-460.029,52	-294.203,63	-140.195,00	2.405,97	571.770,32
NET PRESENT VALUE	at 8,00%	775.967,78			
INTERNAL RATE OF RETURN	37,64%				
MODIFIED INTERNAL RATE OF RETURN	37,64%				
NORMAL PAYBACK	at 0,00%	3.56 years	2020		
DYNAMIC PAYBACK	at 8,00%	3.98 years	2020		

Table 55: Profit /Loss Account

	Production 2018	Production 2019	Production 2024
Sales revenue	245.000,00	245.000,00	245.000,00
Less variable costs	65.363,84	65.363,84	65.363,84
VARIABLE MARGIN	179.636,16	179.636,16	179.636,16
in % of sales revenue	73,320882	73,320882	73,320882
Less fixed costs	39.337,04	39.337,04	39.337,04
OPERATIONAL MARGIN	140.299,12	140.299,12	140.299,12
in % of sales revenue	57,264946	57,264946	57,264946
Financial costs	8.800,00		
GROSS PROFIT FROM OPERATIONS	131.499,12	140.299,12	140.299,12
in % of sales revenue	53,673109	57,264946	57,264946
GROSS PROFIT	131.499,12	140.299,12	140.299,12
TAXABLE PROFIT	131.499,12	140.299,12	140.299,12
NET PROFIT	131.499,12	140.299,12	140.299,12
in % of sales revenue	53,673109	57,264946	57,264946
RETAINED PROFIT	131.499,12	140.299,12	140.299,12
RATIOS			
Net profit to equity (%)	54,78456	58,450776	58,450776
Net profit to net worth (%)	35,394073	27,411393	11,563209
Net profit+interest to investment (%)	30,461816	30,461783	30,461783

Table 56: Bilance Sheet

	Production 2018	Production 2019	Production 2024	Production 2027
Sales revenue	245.000,00	245.000,00	245.000,00	245.000,00
Less variable costs	65.363,84	65.363,84	65.363,84	65.363,84
VARIABLE MARGIN	179.636,16	179.636,16	179.636,16	179.636,16
in % of sales revenue	73,320882	73,320882	73,320882	73,320882
Less fixed costs	39.337,04	39.337,04	39.337,04	39.337,04
OPERATIONAL MARGIN	140.299,12	140.299,12	140.299,12	140.299,12
in % of sales revenue	57,264946	57,264946	57,264946	57,264946
Financial costs	8.800,00			
GROSS PROFIT FROM OPERATIONS	131.499,12	140.299,12	140.299,12	140.299,12
in % of sales revenue	53,673109	57,264946	57,264946	57,264946
GROSS PROFIT	131.499,12	140.299,12	140.299,12	140.299,12
NET PROFIT	131.499,12	140.299,12	140.299,12	140.299,12
in % of sales revenue	53,673109	57,264946	57,264946	57,264946
RETAINED PROFIT	131.499,12	140.299,12	140.299,12	140.299,12
Net profit to equity (%)	54,78456	58,450776	58,450776	58,450776
Net profit to net worth (%)	35,394073	27,411393	11,563209	8,585078
Net profit+interest to investment (%)	30,461816	30,461783	30,461783	30,461783

5.4. Transport

Further project that si presented is in relation to transport opportunities. Some vivid picture of opoortunities and new ideas are presented as follows:

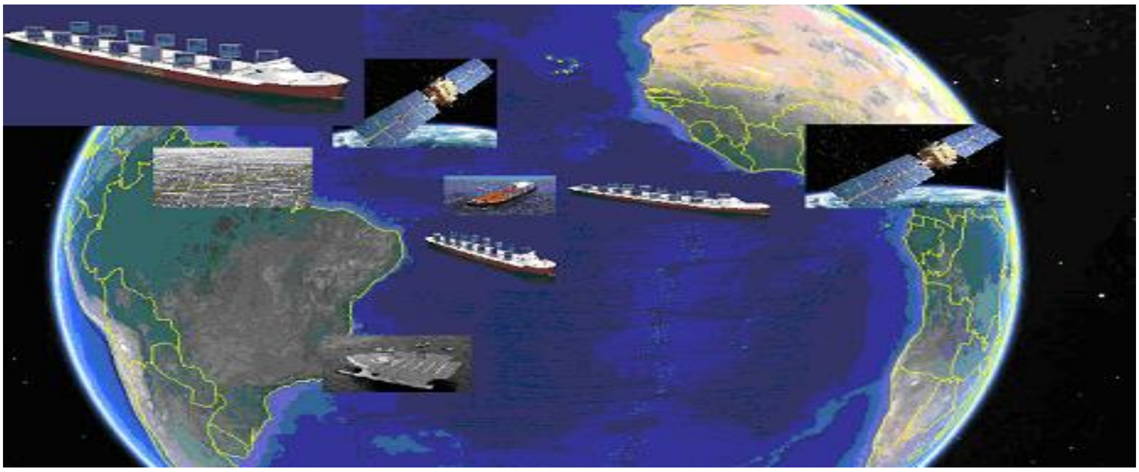
1. Manufacturing solar in all types of equipment,boats, household
   Making many small manufacturing plants with supporting women, low income group as workers. Support tax, market opportunities.

2. Develop big industry to have ships supported with solar inland-Amazon –to decrease CO_2 emission in river

3. Transport on relation Africa –South America can be supported on new innovative way.
   Ships that are sailing on equator can be supplied from sea solar station to sea solar station and reduce usage of oil gas in large quantities.
   This kind of transport with advanced technology can be further accomplished with space station equator solar station in order to supply ships ,tankers,cargo solar, all 24 hours.

-Port Africa+ Solar Plant station1 on equator+Ship Solar on route +Solar plant2 + Port Brazil

-Port Africa+ Solar plant in space,satelite+Ship on equator route solar+Solar plant ocean+Port Brazil



What would that means in reducing harmful gasses especially in CO_2 deacrese, is presented as follows. It is dependent upon ship type, DWT, route, oil type used, gas used, machine pump type, travelling speed, full boat or empty cargo or ballast,number of days in port, etc.

Table 57: Emissions

		CO_2 g/kg fuel	C	CH_4	N_2O	CO	NO_x	NMVOCs
	Mg/ day	3212	876	0,23	0,08	21,3	87	4,9
Solid bulk	33,8	108.565,6	29.608,80	7,77	2,70	719,94	2.940,60	165,62
Liquid bulk	41,1	132.013,0	36.003,60	9,45	3,29	875,43	3.575,70	201,39
General cargo	21,3	68.415,6	18.658,80	4,90	1,70	453,69	1.853,10	104,37
containe r	65,9	211.670,8	57.728,40	15,16	5,27	1.403,67	5.733,30	322,91
Passenge r Ro ro cargo	32,3	103.747,6	28.294,80	7,43	2,58	687,99	2.810,10	158,27
Passenge r	70,2	225.482,6	61.495,20	16,15	5,62	1.495,26	6.107,40	343,98
High speed ferry	80,4	258.244,8	70.430,40	18,49	6,43	1.712,52	6.994,80	393,96
Inland cargo	21,3	68.415,60	18.658,80	4,90	1,70	453,69	1.853,10	104,37
Sail ships	3,4	10.920,80	2.978,40	0,78	0,27	72,42	295,80	16,66
Tugs	14,4	46.252,80	12.614,40	3,31	1,15	306,72	1.252,80	70,56
Fishing	5,5	17.666,00	4.818,00	1,27	0,44	117,15	478,50	26,95
Other ships	26,4	84.796,80	23.126,40	6,07	2,11	562,32	2.296,80	129,36
All ships	32,8	105.353,60	28.732,80	7,54	2,62	698,64	2.853,60	160,72

Table 58: Emissions 1,5 day Cargo Afrika Brazil

		CO_2 ton	C	CH_4	N_2O	CO	NO_x	NMVOCs
	Tkg day	3212	876	0,23	0,08	21,3	87	4,9
Solid bulk	33800	193,14	52,67	0,01	0,00	1,28	5,23	0,29
Liquid bulk	41100	234,85	64,05	0,02	0,01	1,56	6,36	0,36
General cargo	21300	121,71	33,19	0,01	0,00	0,81	3,30	0,19
container	65900	376,56	102,70	0,03	0,01	2,50	10,20	0,57
Passenger Ro ro cargo	32300	184,57	50,34	0,01	0,00	1,22	5,00	0,28
Passenger	70200	401,13	109,40	0,03	0,01	2,66	10,87	0,61

High speed ferry	80400	459,42	125,30	0,03	0,01	3,05	12,44	0,70
Inland cargo	21300	121,71	33,19	0,01	0,00	0,81	3,30	0,19
Sail ships	3400	19,43	5,30	0,00	0,00	0,13	0,53	0,03
Tugs	14400	82,28	22,44	0,01	0,00	0,55	2,23	0,13
Fishing	5500	31,43	8,57	0,00	0,00	0,21	0,85	0,05
Other ships	26400	150,85	41,14	0,01	0,00	1,00	4,09	0,23
All ships	32800	187,42	51,12	0,01	0,00	1,24	5,08	0,29

Some calculation can be presented broadly.More detailed analysis requires exact boat type, route, and many other factors such as :oil price on market, CO_2 price,possibility to trade CO_2 etc.

Table 59: Ship Africa/Brazil 3900km one direction;

Km one direction	Nautical mile. one direction	Nautical mile hiin back	DWT	EVD I	CO_2 Ton both directions	CO_2 Ton one direction	Price 40 $ /barrel; 300 $ ton
1.400,00	2.612,40	5.224,80	80000	2,63	1.099,30	549,65	313.488,00
1.400,00	2.619,86	5.239,73	160000	3,15	2.640,82	1.320,41	314.383,68
3.900,00	7.277,40	14.554,80	80000	2,63	3.062,33	1.531,16	873.288,00
3.900,00	7.277,40	14.554,80	160000	3,15	7.335,62	3.667,81	873.288,00

Table 60: CO_2 price ,different scenario

Nautical mile-hin and back	Price 82 $ /barrel gasoline; 600 $ ton	CO_2 price 5 $ ton	CO_2 price 120 $/ton	CO_2 price 40 $ ton
5.224,80	626.976,00	5.496,49	131.915,75	43.971,92
5.239,73	628.767,36	13.204,11	316.898,75	105.632,92
14.554,80	1.746.576,00	15.311,65	367.479,59	122.493,20
14.554,80	1.746.576,00	36.678,10	880.274,30	293.424,77

5.3. Social Projects

For each country social projects and advances in that respect are of primary importance in further accomplishments. Some problems and solving measures goes as follows:

Table 61: Leadership and Political Participation

	Subjects	Measures
Leadership and Political Participation		
	It is observed by UN that only 22% of all (World) national parliaments have women in ins body. Although this presents an increase of 11 % period 2015/1995 it is a low and insignificant fact in comparison with widely stated equal gender right policy. In Brazil situation was improved with female president, but fluctuates from election to election.	Legally inputted and obligatory number of women to be representative in a State Local Administrative and Government Bodies is the only way to accomplish equal gender rights in the first time.
	Globally, there are 37 States in which women account for less than 10 per cent of parliamentarians in single or lower houses. Brazil faces low number of women - but also can contribute more with racial rights, minority interest and widely spread social projects that cannot be recognized to full extent in other cases	Having a women in Governmental Body is Value added in a way that women contributes with natural topics such as: gender equality, protection of poor, fight against the violence, possibility to housing project, employment to women and they are important part of each society, more humane face in relation to strong capital interest, good relation in area of art and culture, making possible various small projects in area of agriculture contributing to employment ;
	It is not research are that fact is of low interest throughout the world how many women are represented in local bodies of Governmental and non-governmental Organizations	Employment of women in non-governmental organization can be of crucial interest to all that are in need for social benefits, human rights program , good health care for under medium income population, right on school with scholarship given from Community
	Political Parties and Women	Having a women approach is big value added to all countries in the world but in the case of political parties some other programs can be an issues and overshadow women approach. It would be of benefit and obligatory part of party election that each women have to certain extent visible, transparent and independent program in area of social

		improvement, protection of human rights and helping to reduce violence toward women on zero tolerance
	Women in Governmental nongovernmental Organization	Visible results, transparent approach,legal guarantee and many from village to village town to town centers organized around women center that helps with: protection of life, help with medical issues, employment opportunities, tax benefits programs, small loan with good interest for small businesses , help with birth and kinder issues (kindergarten, schools), single parent counseling and help etc.

Old approach:

Election 1= a+ b_1*Program in Economy (Domestic, International)+b_2*(Media approach)+b_3*Last results comments+b_4 *Possible new hope in all areas +b_5 *Guarantee of Social benefits +other

New approach:

Election 2=a+b_1*Diversity and all legal human rights of all groups+b_2 *Economic program visible in all steps with part of income ,gender, age, group improvements and results +b_3 *Environmental program (air, water, electricity production, biodiversity conservation and improvements, forest preservation etc)+b_4* Project for women and socially under privileged group+b_5* Possibilities to enter an international market in a way to work on common interest big and small scale projects+b6 Results from last election in GDP, Social programs , Environmental and Social Improvements presented for each groups(income, gender, age, and area government, manufacturing, agriculture , cultured) +b_7* Media presentation in equal rights (advertisement for big and small in each share guaranteed) +e

Table 62: Economic Empowerment

	Subjects	Measures
Economic Empowerment		
	When more women work, economies grow. An increase in female labor force participation—or a reduction in the gap between women's and men's labor force participation—results in faster economic growth	Women in man contribute different to Economic growth. Women jobs are more related toward tertiary sector (education, medical, school,), manufacturing (workers) but are often employed in agriculture or as domestic workers. They work is a three shift program (job, children, home) and often not paid or recognized enough. With more educational opportunities quality in tertiary sector grows and in a natural way society improves in economic results
	Evidence from a range of countries shows that increasing the share of household income controlled by women, either through their own earnings or cash transfers, changes spending in ways that benefit children	Women approach is often related to long term strategies - and she is more concerned with spending that is related to family or community. Putting more activities and women in programs that are related to school education , relation between government tax- scholarship programs, industry – base education , more counseling in school and communities that would provide equal opportunity to school for all member of society
	Gender inequalities in time use are still large and persistent in all countries. When paid and unpaid work are combined, women in developing countries work more than men, with less time for education, leisure, political participation and self-care . Despite some improvements over the last 50 years, in virtually every country, men spend more time on leisure each day while women spend more time doing unpaid work at job.	Each organization should have policy toward women in Boards, on position , counseling in company, guarantees of employment, guarantee of minority , single parent right to work, and a way that job is related to formula that worth's for both :men and women. With high number of men on positions, contribution of women is often low valued. Women can be exploited: high level of effort, not equal rights on benefits, job type (home and work) is not recognized and put in observation etc.
	Women's economic equality is good for business. Companies greatly benefit from increasing leadership opportunities for women, which is shown to increase organizational effectiveness...	Women brings new approach, insights, better transparency, more observed toward social programs and community, are more creative, are more able to work on jobs that requires repetitive actions, are reliable and supportive bringing stability and long term prospects.
	Women comprise an average of 43 per cent of the agricultural labor force in developing countries, varying considerably across regions from 20 per cent or less in Latin America to 50 per cent or more in parts of Asia and Africa.	Agriculture loans for women, small land opportunity and communities, guaranteed price and market, good communication between unemployed women and opportunities to work, jobs that are related to land and contribution of biodiversity preservation ,animal protection and growth etc.

	Women farmers control less land than do men, and also have limited access to inputs, seeds, credits, and extension services. Less than 20 per cent of landholders are women. Gender differences in access to land and credit affect the relative ability of female and male farmers and entrepreneurs to invest operate to scale, and benefit from new economic opportunities.	Improve seed /women; price/women; landlord/women; credit possibility/women projects and report regularly in all report in TV, newspaper. Stock Exchange, local bodies. have transparent computer program that offers all advices in case of women agriculture jobs and projects available in all places in Brazil
	Women farmers are often required to have full day job, without land ownership and have in that respect low level of influence of its own family growth	Help women in agriculture to have rights on family time, right on vocation , right to have special scholarship for their children, possibility to rise family in some sort of end result work guarantee (medium term long term contracts, secure market, price guarantee to certain extent etc.)

Women in Business

Old approach= a_1+b_1* Not important number of women in Bord+b_2* Salary difference based on result, effort that is not having all aspects in consideration+b_3* Company first, a person on last position+b_4*Capital influence+other

New approach=a_1+b_1*Number of women in positions+b_2*Right on equal payment , salary+b_3*Visible gender programs for each business+b_4*Followed result in women based program (aim/result)+b_5*More scholarships to schools for girls +b_6*Small scale projects that guarantee market, price , input equal to men and women+b_7 equal rights on loan, vocation, family rights

Table 63: Sexual Violence

	Subjects	Measures
Sexual Violence		
	It is estimated that 35 per cent of women worldwide have experienced either physical and/or sexual intimate partner violence or sexual violence by a non-partner at some point in their lives. However, some national studies show that up to 70 per cent of women have experienced physical and/or sexual violence	Projects supported by media, Government, on governmental organization that promote ZERO VIOLENCE policy. It starts from kindergarten with education, schools with projects types, universities where equal right on school is guaranteed, on ground many offices that supports women , in protection, counseling, education, health projects, giving support to single women, etc. Strong Government regulation, legal protection, transparency of all topics related, projects as obligatory part of Community life that raises dignity of weaker gender.
	Although little data is available—and great variation in how psychological violence is measured across countries and cultures—existing evidence shows high prevalence rates. Forty-three per cent of women in the 28 European Union Member States have experienced some form of psychological violence by an intimate partner in their lifetime	Although it is stated that high GDP level countries support women more, and have more quality approach toward gender issues than low GDP countries still large percentage of women are subject of abuse and mistreatments. This can be related toward GDP while man is more eager to success based on women; women are exploited more in poor region. Some countries show that through education, psychological help of abuser, proper police reaction, legal guarantee and good and solid community environment- healthy psychological surroundings GDP level is not main issues and work toward common goal with respect to all is possible.
	Worldwide, more than 700 million women alive today were married as children (below 18 years of age). Child brides are often unable to effectively negotiate safe sex, leaving them vulnerable to early pregnancy as well as sexually transmitted infections, including HIV	Programs that offers counseling in community, free literature and educational opportunities can prevent strong relation GDP/early marriage, health problems, etc.
	At least 200 million women and girls alive today have undergone female genital mutilation.	Legal Protection, Government support; Police work more supportive
	Adult women account for almost half of all human trafficking victims detected globally.	
	One in 10 women in the European Union report having experienced cyber-harassment since the age of 15.	Even advanced societies have problems with negotiating strength relation, and finding new means to find a victim hiding in invisibility cloaks. Better transparency of topic, education, media support, constant warning and protection from non-

		govern organization, control of potential recognized abusers , free psychological counseling , victim support etc.

Sexs abuse Old=a_1+b_1*Strong GDP /abuse relation+b_2 *Manner society against women+b_3*Control of media, interest, profit opportunity, based on abuse+b_4*Once victim always victim (victim is not welcomed in police, abuser is more stronger person) +b_5* Legal protection is not guranteed+b_6*Not enough proof for abuser +b_7* strong economic relation support domestic violence+b_8*Problems are solved on spot instead on long term program base+e

Sexs abuse New-More protection Zero tolerance= a_1+b_1*education in school+b_2 *preventive programs+b_3* media support+b_4 Government legal protection+b_5 *support to victim and not abuser+b6*GDP growth that is related to all genders equally+b_7 *no tolerance toward violence and treats+b_8*support to single women+b_9 health support in case of pregnancy (early, each)+e

6. STATISTICS –SOME RELATIONS

Statistical observation is divided in to parts: the first one is related to world prices of commodities since one oil price shock was main driver for renewables to be considered more actively in Brazil, the second one is related to macroeconomic variables that relate one to another.

Prices, macro variables are marked as:

Crude oil, average	Fish meal	Groundnut oil	Palm oil	Palm kernel oil	Soybeans	Soybean oil	Soybean meal	Barley	Maize	Sorghum	Wheat, US SRW	Wheat, US HRW	Sugar, EU	Sugar, US	Sugar, world	Urea
($/bbl)	($/mt)	($/mt)	($/mt)	($/mt)	($/mt)	($/mt)	($/mt)	($/mt)	($/mt)	($/mt)	($/mt)	($/mt)	($/kg)	($/kg)	($/kg)	($/mt)
B	C	D	F	G	H	II	K	P	R	T	Z	U	M	N	X	W

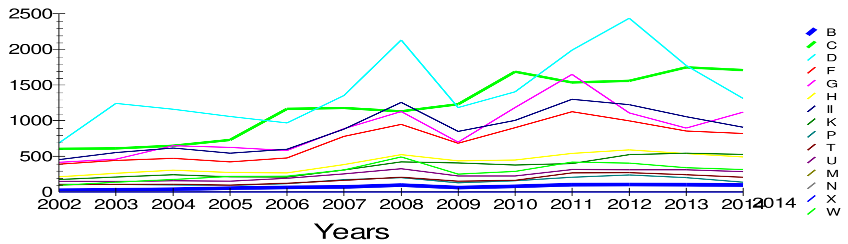
Unemployment, total (% of total labor force) (national estimate)	Q
Unemployment, total (% of total labor force) (modeled ILO estimate)	W
Population, total	E
Rural population	R
Inflation, GDP deflator (annual %)	T
GDP (current US$)	Z
GDP growth (annual %)	U
Natural gas rents (% of GDP)	II
GDP per capita (current US$)	OO
GDP per capita growth (annual %)	P
Oil rents (% of GDP)	A
Gross domestic savings (% of GDP)	S
Gross savings (% of GDP)	D
Agriculture, value added (current US$)	F
Agriculture, value added (annual % growth)	G
Agriculture, value added (% of GDP)	H
Manufacturing, value added (current US$)	J
Manufacturing, value added (annual % growth)	K
Manufacturing, value added (% of GDP)	L
Industry, value added (current US$)	Y
Industry, value added (constant LCU)	X
Industry, value added (% of GDP)	C
Services, etc., value added (current US$)	V
Services, etc., value added (annual % growth)	B
Services, etc., value added (% of GDP)	N
Import volume index (2000 = 100)	M
Import value index (2000 = 100)	AA
Export volume index (2000 = 100)	SS
Food exports (% of merchandise exports)	D.D.
Fuel exports (% of merchandise exports)	FF
Export value index (2000 = 100)	GG
Electricity production from renewable sources, excluding hydroelect	HH
Electricity production from renewable sources, excluding hydroelect	JJ
Renewable energy consumption (% of total final energy consumption	KK
Electric power consumption (kWh per capita)	LL
Energy use (kg of oil equivalent per capita)	YY
International tourism, number of arrivals	XX
Investment in energy with private participation (current US$)	CC
Investment in telecoms with private participation (current US$)	VV
Investment in transport with private participation (current US$)	BB
Investment in water and sanitation with private participation (curre	NN
Money (current LCU)	MM
Money and quasi money (M2) (current LCU)	QQ
Money and quasi money (M2) as % of GDP	WW
Money and quasi money (M2) to total reserves ratio	EE
Money and quasi money growth (annual %)	RR
Quasi money (current LCU)	TT
Consumer price index (2010 = 100)	ZZ
Inflation, consumer prices (annual %)	UU
Wholesale price index (2010 = 100)	III
Deposit interest rate (%)	OO
Lending interest rate (%)	P

Main results goes as follows:

- Prices are interrelated and all were subject to change especially in great 2008 crises when 2009 brought significant reduction
- The only price that is dependent to lesser extent to oil is the price of sugar , in that respect Brazil had good hedge against potential price rise of oil in future; the soon weak relation between prices is maize price and palm oil price
- Stationary series are I(O) ground oil, palm kern, sorghum, sugar have weak unit root
- Economy is under strong influence of world economy (GDP decrease 2009 –USA influence)

-Large significant unemployment in agriculture women related jobs, female unemployment still significant (agriculture was more than 45%)
- All inner variables –import export has shown significant downturn in 2009 and showed inner/out vulnerability
-Increased yield is a result from larger fertilizer consumption
-Weaker than expected rise in Tourism arrival, other sectors main contributors to GDP growth
-Inflation, deposit rate declining trend- economy is moving toward world money market
-Weak recovery in GDP growth after 2009 crises, new strategy in economy (locally, globally) needed
-Lower than expected rise in electricity consumption per kWh /rise in population-dependent upon GDP growth

CIJENE, PLOT B C DO KRJA



PLOT L B LC L W

Sample period   :2002 to 2014

Variable(s) :	B	C	D	F	G	H
Maximum :	105.0000	1747.0	2436.0	1125.0	1648.0	591.0000
Minimum :	25.0000	606.0000	687.0000	390.0000	416.0000	213.0000
Mean :	71.3077	1195.5	1438.6	716.8462	877.6154	406.4615
Std. Deviation :	29.0413	434.7702	501.6912	250.9774	352.1566	128.2839
Skewness :	-.27875	-.16720	.61646	.020522	.59137	-.11017
Kurtosis - 3 :	-1.2816	-1.4208	-.54486	-1.4035	-.28158	-1.4681
Coef of Variation:	.40727	.36366	.34873	.35011	.40127	.31561

Sample period :2002 to 2014

Variable(s) :	II	K	P	T	U	M
Maximum :	1299.0	545.0000	240.0000	272.0000	326.0000	.70000
Minimum :	454.0000	175.0000	95.0000	96.0000	146.0000	.42000
Mean :	865.5385	351.0000	151.6154	170.4615	234.6154	.55462
Std. Deviation :	293.3759	133.5003	48.4915	63.6771	70.8914	.11148
Skewness :	.10716	.13419	.42174	.39029	-.017845	.0047548
Kurtosis - 3 :	-1.3521	-1.4111	-1.1919	-1.2454	-1.5774	-1.6906
Coef of Variation:	.33895	.38034	.31983	.37356	.30216	.20100

Sample period :2002 to 2014

Variable(s) :	N	X	W
Maximum :	.84000	.57000	493.0000
Minimum :	.45000	.15000	94.0000
Mean :	.54385	.32231	282.5385
Std. Deviation :	.13188	.13633	115.4633
Skewness :	1.4211	.22739	.14956
Kurtosis - 3 :	.52197	-1.1000	-.75552
Coef of Variation:	.24249	.42298	.40866

Estimated Correlation Matrix of Variables

****

	B	C	D	F	G	H
B	1.0000	.89036	.81218	.91161	.84449	.93477
C	.89036	1.0000	.57323	.82281	.75070	.83929
D	.81218	.57323	1.0000	.85243	.73859	.88001
F	.91161	.82281	.85243	1.0000	.93952	.94533
G	.84449	.75070	.73859	.93952	1.0000	.83468
H	.93477	.83929	.88001	.94533	.83468	1.0000
II	.91274	.76291	.91257	.98199	.89851	.95719
K	.87969	.86383	.73216	.81606	.67524	.94282
P	.86505	.70776	.92066	.90730	.75844	.88948
T	.92835	.81313	.88155	.93153	.83904	.94858
U	.95540	.80566	.84878	.92986	.81725	.94500
M	-.52327	-.73859	-.35910	-.55246	-.50133	-.60148
N	.46464	.55883	.41781	.65820	.76397	.49960
X	.79752	.86092	.60451	.81469	.80866	.78491
W	.92183	.68733	.88662	.90800	.84219	.89468

Estimated Correlation Matrix of Variables

****

	II	K	P	T	U	M
B	.91274	.87969	.86505	.92835	.95540	-.52327
C	.76291	.86383	.70776	.81313	.80566	-.73859
D	.91257	.73216	.92066	.88155	.84878	-.35910
F	.98199	.81606	.90730	.93153	.92986	-.55246
G	.89851	.67524	.75844	.83904	.81725	-.50133

H	.95719	.94282	.88948	.94858	.94500	-.60148
II	1.0000	.81626	.92823	.93015	.94511	-.46630
K	.81626	1.0000	.76334	.87311	.87856	-.68242
P	.92823	.76334	1.0000	.93463	.91677	-.46675
T	.93015	.87311	.93463	1.0000	.94880	-.63873
U	.94511	.87856	.91677	.94880	1.0000	-.46120
M	-.46630	-.68242	-.46675	-.63873	-.46120	1.0000
N	.57586	.32323	.44864	.51777	.37463	-.61009
X	.76984	.69743	.67366	.78788	.69895	-.74101
W	.95068	.75458	.87392	.85965	.93900	-.25290

Estimated Correlation Matrix of Variables

****

	N	X	W
B	.46464	.79752	.92183
C	.55883	.86092	.68733
D	.41781	.60451	.88662
F	.65820	.81469	.90800
G	.76397	.80866	.84219
H	.49960	.78491	.89468
II	.57586	.76984	.95068
K	.32323	.69743	.75458
P	.44864	.67366	.87392
T	.51777	.78788	.85965
U	.37463	.69895	.93900
M	-.61009	-.74101	-.25290
N	1.0000	.82449	.41019
X	.82449	1.0000	.65626
W	.41019	.65626	1.0000

****

Unit root tests for variable B

The Dickey-Fuller regressions include an intercept but not a trend

****

11 observations used in the estimation of all ADF regressions.
Sample period from 2004 to 2014

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.8094	-44.6540	-46.6540	-47.0519	-46.4032
ADF(1)	-1.5621	-44.2680	-47.2680	-47.8648	-46.8918

****

95% critical value for the augmented Dickey-Fuller statistic = -3.1803
LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion   HQC = Hannan-Quinn Criterion

Unit root tests for variable B
The Dickey-Fuller regressions include an intercept and a linear trend
****
11 observations used in the estimation of all ADF regressions.
Sample period from 2004 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.6625	-42.4642	-45.4642	-46.0611	-45.0880
ADF(1)	-2.3396	-41.9591	-45.9591	-46.7549	-45.4575

****
95% critical value for the augmented Dickey-Fuller statistic = -3.9272
LL = Maximized log-likelihood   AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion   HQC = Hannan-Quinn Criterion

Unit root tests for variable C
The Dickey-Fuller regressions include an intercept but not a trend
****
11 observations used in the estimation of all ADF regressions.
Sample period from 2004 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.1790	-72.1385	-74.1385	-74.5364	-73.8876
ADF(1)	-.92719	-71.8804	-74.8804	-75.4773	-74.5042

****
95% critical value for the augmented Dickey-Fuller statistic = -3.1803
LL = Maximized log-likelihood   AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion   HQC = Hannan-Quinn Criterion

Unit root tests for variable C
The Dickey-Fuller regressions include an intercept and a linear trend
****
11 observations used in the estimation of all ADF regressions.
Sample period from 2004 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.7615	-69.1047	-72.1047	-72.7016	-71.7285
ADF(1)	-3.0001	-67.7647	-71.7647	-72.5605	-71.2631

****
95% critical value for the augmented Dickey-Fuller statistic = -3.9272
LL = Maximized log-likelihood   AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion   HQC = Hannan-Quinn Criterion

```
                 Unit root tests for variable D
    The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 11 observations used in the estimation of all ADF regressions.
 Sample period from 2004 to 2014
*******************************************************************************
      Test Statistic     LL        AIC        SBC        HQC
 DF        -2.0335     -82.2110    -84.2110    -84.6089    -83.9602
 ADF(1)    -2.0002     -81.9931    -84.9931    -85.5899    -84.6169
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.1803
 LL  = Maximized log-likelihood     AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                 Unit root tests for variable D
   The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 11 observations used in the estimation of all ADF regressions.
 Sample period from 2004 to 2014
*******************************************************************************
      Test Statistic     LL        AIC        SBC        HQC
 DF        -2.3780     -81.2253    -84.2253    -84.8221    -83.8490
 ADF(1)    -4.7749     -76.0977    -80.0977    -80.8935    -79.5961
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.9272
 LL  = Maximized log-likelihood     AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

Unit root tests for variable F
The Dickey-Fuller regressions include an intercept but not a trend
****
11 observations used in the estimation of all ADF regressions.
Sample period from 2004 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.5435	-70.8275	-72.8275	-73.2254	-72.5767
ADF(1)	-1.4856	-70.7737	-73.7737	-74.3705	-73.3975

****
95% critical value for the augmented Dickey-Fuller statistic = -3.1803
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable F
The Dickey-Fuller regressions include an intercept and a linear trend
****
11 observations used in the estimation of all ADF regressions.
Sample period from 2004 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.6687	-70.1853	-73.1853	-73.7822	-72.8091
ADF(1)	-2.5482	-68.1881	-72.1881	-72.9839	-71.6865

****
95% critical value for the augmented Dickey-Fuller statistic = -3.9272
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

```
               Unit root tests for variable G
    The Dickey-Fuller regressions include an intercept but not a trend
*******************************************************************************
 11 observations used in the estimation of all ADF regressions.
 Sample period from 2004 to 2014
*******************************************************************************
      Test Statistic     LL          AIC          SBC          HQC
 DF        -2.0702     -77.1299     -79.1299     -79.5278     -78.8791
 ADF(1)    -1.8263     -77.1252     -80.1252     -80.7220     -79.7489
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.1803
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion


               Unit root tests for variable G
   The Dickey-Fuller regressions include an intercept and a linear trend
*******************************************************************************
 11 observations used in the estimation of all ADF regressions.
 Sample period from 2004 to 2014
*******************************************************************************
      Test Statistic     LL          AIC          SBC          HQC
 DF        -2.5739     -75.8552     -78.8552     -79.4521     -78.4790
 ADF(1)    -3.6640     -72.9607     -76.9607     -77.7565     -76.4591
*******************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.9272
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

Unit root tests for variable H

The Dickey-Fuller regressions include an intercept but not a trend

****

11 observations used in the estimation of all ADF regressions.

Sample period from 2004 to 2014

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.3919	-61.2797	-63.2797	-63.6776	-63.0289
ADF(1)	-1.3717	-61.1819	-64.1819	-64.7787	-63.8056

****

95% critical value for the augmented Dickey-Fuller statistic = -3.1803

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable H

The Dickey-Fuller regressions include an intercept and a linear trend

****

11 observations used in the estimation of all ADF regressions.

Sample period from 2004 to 2014

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.8518	-60.1184	-63.1184	-63.7153	-62.7422
ADF(1)	-3.7353	-56.0496	-60.0496	-60.8454	-59.5479

****

95% critical value for the augmented Dickey-Fuller statistic = -3.9272

LL = Maximized log-likelihood AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable II
The Dickey-Fuller regressions include an intercept but not a trend
****
11 observations used in the estimation of all ADF regressions.
Sample period from 2004 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.7292	-73.5975	-75.5975	-75.9954	-75.3466
ADF(1)	-1.6017	-73.5853	-76.5853	-77.1821	-76.2091

****
95% critical value for the augmented Dickey-Fuller statistic = -3.1803
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable II
The Dickey-Fuller regressions include an intercept and a linear trend
****
11 observations used in the estimation of all ADF regressions.
Sample period from 2004 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.7515	-73.0101	-76.0101	-76.6070	-75.6339
ADF(1)	-2.2383	-71.6922	-75.6922	-76.4880	-75.1905

****
95% critical value for the augmented Dickey-Fuller statistic = -3.9272
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable K
The Dickey-Fuller regressions include an intercept but not a trend

****

11 observations used in the estimation of all ADF regressions.
Sample period from 2004 to 2014

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-.67049	-59.5293	-61.5293	-61.9272	-61.2785
ADF(1)	-.82183	-59.2862	-62.2862	-62.8830	-61.9100

****

95% critical value for the augmented Dickey-Fuller statistic = -3.1803
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable K
The Dickey-Fuller regressions include an intercept and a linear trend

****

11 observations used in the estimation of all ADF regressions.
Sample period from 2004 to 2014

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.4063	-56.7994	-59.7994	-60.3962	-59.4231
ADF(1)	-5.7638	-50.1150	-54.1150	-54.9108	-53.6134

****

95% critical value for the augmented Dickey-Fuller statistic = -3.9272
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable T
The Dickey-Fuller regressions include an intercept but not a trend
****
11 observations used in the estimation of all ADF regressions.
Sample period from 2004 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.3680	-55.8657	-57.8657	-58.2636	-57.6149
ADF(1)	-1.4436	-55.6267	-58.6267	-59.2235	-58.2505

****
95% critical value for the augmented Dickey-Fuller statistic = -3.1803
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable T
The Dickey-Fuller regressions include an intercept and a linear trend
****
11 observations used in the estimation of all ADF regressions.
Sample period from 2004 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.1693	-54.2268	-57.2268	-57.8237	-56.8506
ADF(1)	-4.5702	-49.1616	-53.1616	-53.9574	-52.6599

****
95% critical value for the augmented Dickey-Fuller statistic = -3.9272
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable U
The Dickey-Fuller regressions include an intercept but not a trend
****
11 observations used in the estimation of all ADF regressions.
Sample period from 2004 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.6551	-57.3960	-59.3960	-59.7939	-59.1452
ADF(1)	-1.5539	-57.3493	-60.3493	-60.9462	-59.9731

****
95% critical value for the augmented Dickey-Fuller statistic = -3.1803
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable U
The Dickey-Fuller regressions include an intercept and a linear trend
****
11 observations used in the estimation of all ADF regressions.
Sample period from 2004 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.2846	-55.9179	-58.9179	-59.5147	-58.5417
ADF(1)	-3.1756	-53.7129	-57.7129	-58.5087	-57.2112

****
95% critical value for the augmented Dickey-Fuller statistic = -3.9272
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable M
The Dickey-Fuller regressions include an intercept but not a trend

****

11 observations used in the estimation of all ADF regressions.
Sample period from 2004 to 2014

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-.58292	14.9795	12.9795	12.5816	13.2303
ADF(1)	-1.0009	15.7550	12.7550	12.1582	13.1313

****

95% critical value for the augmented Dickey-Fuller statistic = -3.1803
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable M
The Dickey-Fuller regressions include an intercept and a linear trend

****

11 observations used in the estimation of all ADF regressions.
Sample period from 2004 to 2014

****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.3810	17.9910	14.9910	14.3941	15.3672
ADF(1)	-2.6087	18.9479	14.9479	14.1521	15.4495

****

95% critical value for the augmented Dickey-Fuller statistic = -3.9272
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable N
The Dickey-Fuller regressions include an intercept but not a trend
****
11 observations used in the estimation of all ADF regressions.
Sample period from 2004 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.5232	9.2439	7.2439	6.8460	7.4947
ADF(1)	-2.5736	11.8039	8.8039	8.2070	9.1801

****
95% critical value for the augmented Dickey-Fuller statistic = -3.1803
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable N
The Dickey-Fuller regressions include an intercept and a linear trend
****
11 observations used in the estimation of all ADF regressions.
Sample period from 2004 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.4031	9.3170	6.3170	5.7202	6.6933
ADF(1)	-6.0188	18.5311	14.5311	13.7353	15.0327

****
95% critical value for the augmented Dickey-Fuller statistic = -3.9272
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable X
The Dickey-Fuller regressions include an intercept but not a trend
****
11 observations used in the estimation of all ADF regressions.
Sample period from 2004 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.5130	13.1848	11.1848	10.7869	11.4356
ADF(1)	-1.5326	13.3860	10.3860	9.7891	10.7622

****
95% critical value for the augmented Dickey-Fuller statistic = -3.1803
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable X
The Dickey-Fuller regressions include an intercept and a linear trend
****
11 observations used in the estimation of all ADF regressions.
Sample period from 2004 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.1874	13.3589	10.3589	9.7621	10.7351
ADF(1)	-1.9294	14.8127	10.8127	10.0169	11.3143

****
95% critical value for the augmented Dickey-Fuller statistic = -3.9272
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable W
The Dickey-Fuller regressions include an intercept but not a trend
****
11 observations used in the estimation of all ADF regressions.
Sample period from 2004 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.3612	-64.3036	-66.3036	-66.7015	-66.0528
ADF(1)	-2.0187	-64.2883	-67.2883	-67.8852	-66.9121

****
95% critical value for the augmented Dickey-Fuller statistic = -3.1803
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable W
The Dickey-Fuller regressions include an intercept and a linear trend
****
11 observations used in the estimation of all ADF regressions.
Sample period from 2004 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.5319	-63.4215	-66.4215	-67.0184	-66.0453
ADF(1)	-2.4032	-62.7237	-66.7237	-67.5195	-66.2221

****
95% critical value for the augmented Dickey-Fuller statistic = -3.9272
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Ordinary Least Squares Estimation

****

Dependent variable is LB
13 observations used for estimation from 2002 to 2014

****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
CON	-3.6568	1.0068	-3.6321[.004]
LC	1.1155	.14329	7.7848[.000]

****

R-Squared	.84638	R-Bar-Squared	.83241
S.E. of Regression	.20216	F-stat. F(1, 11)	60.6033[.000]
Mean of Dependent Variable	4.1688	S.D. of Dependent Variable	.49382
Residual Sum of Squares	.44954	Equation Log-likelihood	3.4229
Akaike Info. Criterion	1.4229	Schwarz Bayesian Criterion	.85794
DW-statistic	1.8115		

****

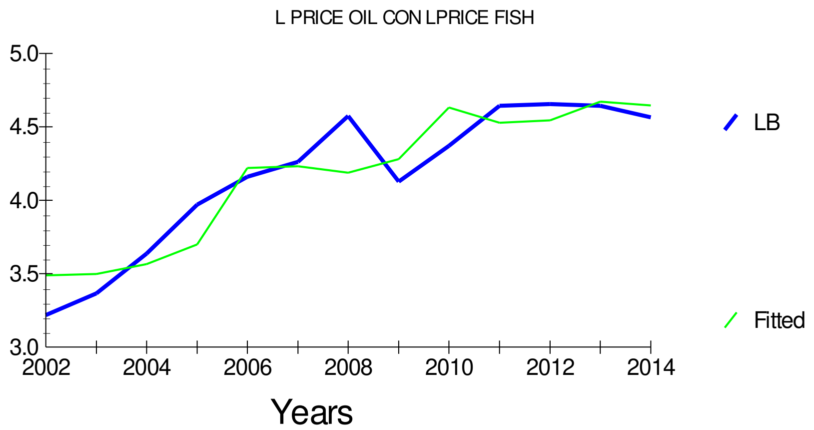
Diagnostic Tests

****

* Test Statistics * LM Version * F Version *

****

* * * *



Ordinary Least Squares Estimation

****

Dependent variable is LD
13 observations used for estimation from 2002 to 2014

****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
CON	4.8980	.54765	8.9437[.000]
LB	.55605	.13053	4.2600[.001]

****

R-Squared	.62261	R-Bar-Squared	.58830
S.E. of Regression	.22328	F-stat. F(1, 11)	18.1478[.001]
Mean of Dependent Variable	7.2161	S.D. of Dependent Variable	.34799
Residual Sum of Squares	.54841	Equation Log-likelihood	2.1308
Akaike Info. Criterion	.13076	Schwarz Bayesian Criterion	-.43419
DW-statistic	1.7008		

****

Diagnostic Tests

****

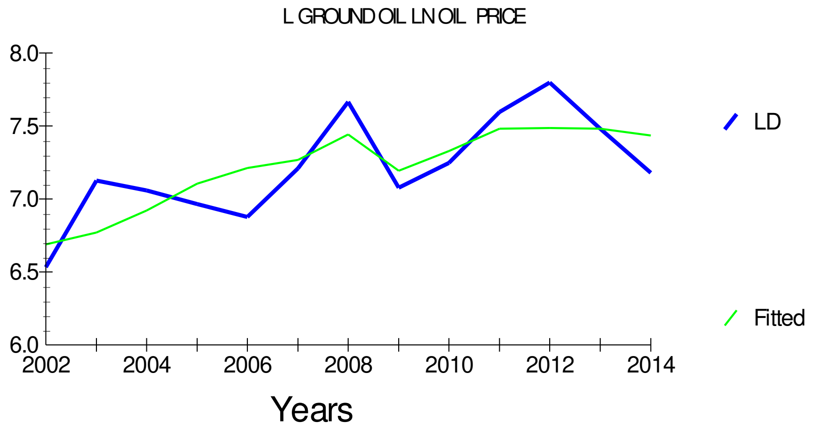
* Test Statistics * LM Version * F Version *

****

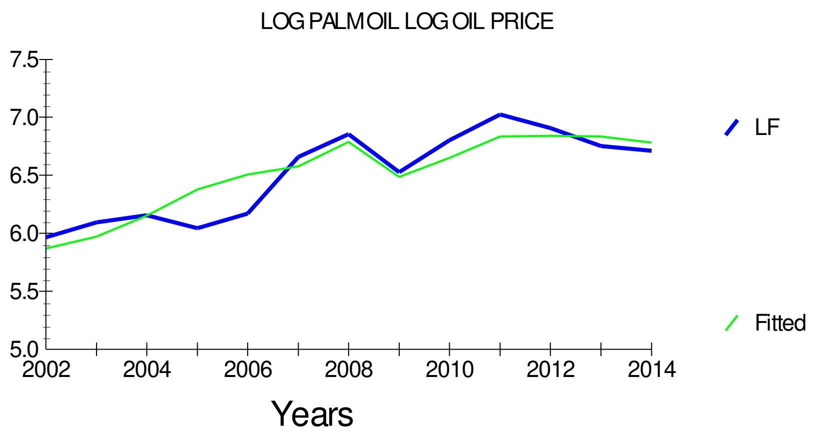
* * * *

* A:Serial Correlation*CHSQ(1)= .068638[.793]*F(1, 10)= .053079[.822]*

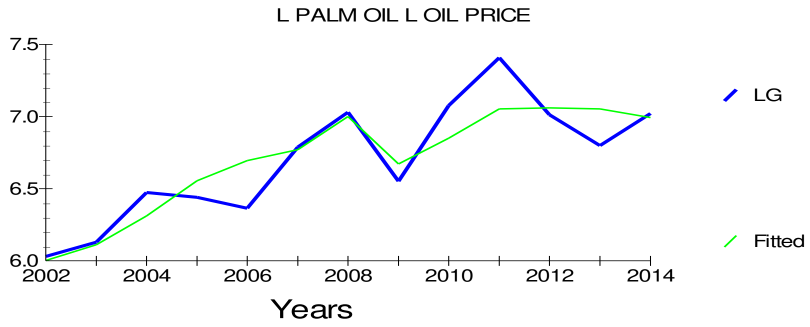
```
*              *                  *                    *
* B:Functional Form   *CHSQ(   1)=   2.2567[.133]*F(   1,  10)=   2.1006[.178]*
*              *                  *                    *
* C:Normality       *CHSQ(   2)=   .67662[.713]*      Not applicable      *
*              *                  *                    *
* D:Heteroscedasticity*CHSQ(   1)=   .27136[.602]*F(   1,  11)=   .23451[.638]*
*******************************************************************************
  A:Lagrange multiplier test of residual serial correlation
  B:Ramsey's RESET test using the square of the fitted values
  C:Based on a test of skewness and kurtosis of residuals
  D:Based on the regression of squared residuals on squared fitted values
```



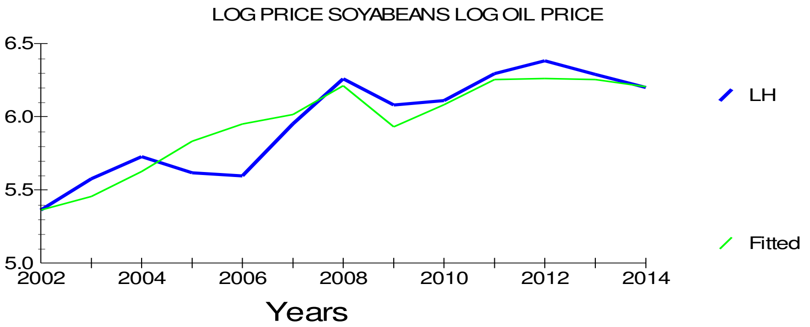

```
      Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is LF
 13 observations used for estimation from 2002 to 2014
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 CON                     3.6925              .43015               8.5842[.000]
 LB                       .67661              .10252               6.5997[.000]
*******************************************************************************
 R-Squared                    .79837   R-Bar-Squared                  .78004
 S.E. of Regression           .17538   F-stat.    F(  1,  11)   43.5558[.000]
 Mean of Dependent Variable   6.5131   S.D. of Dependent Variable     .37394
 Residual Sum of Squares      .33832   Equation Log-likelihood        5.2704
 Akaike Info. Criterion       3.2704   Schwarz Bayesian Criterion     2.7054
 DW-statistic                 1.0523
*******************************************************************************


                       Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version        *          F Version         *
*******************************************************************************
*              *                  *                    *
* A:Serial Correlation*CHSQ(   1)=   2.7133[.100]*F(   1,  10)=   2.6377[.135]*
*              *                  *                    *
* B:Functional Form   *CHSQ(   1)=   3.2292[.072]*F(   1,  10)=   3.3050[.099]*
*              *                  *                    *
* C:Normality       *CHSQ(   2)=   2.7791[.249]*      Not applicable      *
*              *                  *                    *
* D:Heteroscedasticity*CHSQ(   1)=  .051051[.821]*F(   1,  11)=  .043367[.839]*
*******************************************************************************
  A:Lagrange multiplier test of residual serial correlation
  B:Ramsey's RESET test using the square of the fitted values
  C:Based on a test of skewness and kurtosis of residuals
  D:Based on the regression of squared residuals on squared fitted values
```




```
                 Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is LG
 13 observations used for estimation from 2002 to 2014
*******************************************************************************
 Regressor           Coefficient       Standard Error        T-Ratio[Prob]
 CON                  3.6325            .47357            7.6704[.000]
 LB                 .73632            .11287            6.5235[.000]
*******************************************************************************
 R-Squared                    .79461   R-Bar-Squared                 .77593
 S.E. of Regression           .19308   F-stat.    F(  1,  11)  42.5559[.000]
 Mean of Dependent Variable   6.7020   S.D. of Dependent Variable    .40790
 Residual Sum of Squares      .41008   Equation Log-likelihood       4.0200
 Akaike Info. Criterion       2.0200   Schwarz Bayesian Criterion    1.4551
 DW-statistic                 1.7287
*******************************************************************************


                       Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version        *         F Version          *
*******************************************************************************
*                     *                          *                            *
* A:Serial Correlation*CHSQ(   1)=   .23326[.629]*F(   1,  10)=   .18271[.678]*
*                     *                          *                            *
* B:Functional Form   *CHSQ(   1)=   .78020[.377]*F(   1,  10)=   .63847[.443]*
*                     *                          *                            *
* C:Normality         *CHSQ(   2)=  .044649[.978]*       Not applicable       *
*                     *                          *                            *
* D:Heteroscedasticity*CHSQ(   1)=   1.3412[.247]*F(   1,  11)=   1.2654[.285]*
*******************************************************************************
  A:Lagrange multiplier test of residual serial correlation
  B:Ramsey's RESET test using the square of the fitted values
  C:Based on a test of skewness and kurtosis of residuals
  D:Based on the regression of squared residuals on squared fitted values
```

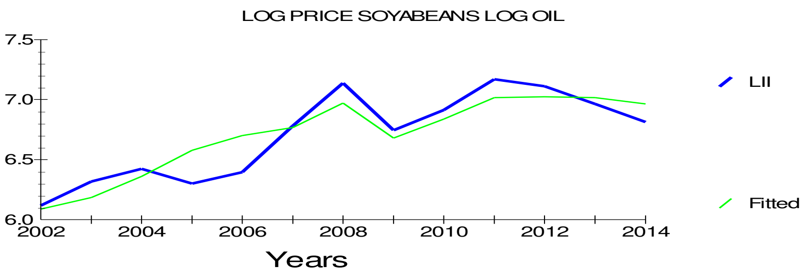



```
              Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is LH
 13 observations used for estimation from 2002 to 2014
*******************************************************************************
 Regressor           Coefficient       Standard Error        T-Ratio[Prob]
 CON                  3.3478             .36626            9.1403[.000]
 LB                  .62582             .087295            7.1691[.000]
*******************************************************************************
 R-Squared                    .82370   R-Bar-Squared                 .80768
 S.E. of Regression           .14933   F-stat.    F(  1,  11)   51.3953[.000]
 Mean of Dependent Variable   5.9567   S.D. of Dependent Variable     .34051
 Residual Sum of Squares      .24529   Equation Log-likelihood        7.3605
 Akaike Info. Criterion       5.3605   Schwarz Bayesian Criterion     4.7956
 DW-statistic                 1.1209
*******************************************************************************


                  Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version         *         F Version          *
*******************************************************************************
*                     *                           *                            *
* A:Serial Correlation*CHSQ(   1)=   2.5114[.113]*F(   1,  10)=   2.3944[.153]*
*                     *                           *                            *
* B:Functional Form   *CHSQ(   1)=   2.5205[.112]*F(   1,  10)=   2.4052[.152]*
*                     *                           *                            *
* C:Normality         *CHSQ(   2)=   4.9664[.083]*       Not applicable        *
*                     *                           *                            *
* D:Heteroscedasticity*CHSQ(   1)=   .13497[.713]*F(   1,  11)=   .11540[.740]*
*******************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values
```



rdinary Least Squares Estimation

```
*******************************************************************************
 Dependent variable is LII
 13 observations used for estimation from 2002 to 2014
*******************************************************************************
 Regressor            Coefficient       Standard Error         T-Ratio[Prob]
 CON                  3.9894            .39600             10.0743[.000]
 LB                   .65180            .094383            6.9059[.000]
*******************************************************************************
 R-Squared                    .81258   R-Bar-Squared                .79554
 S.E. of Regression           .16145   F-stat.    F(  1,  11)   47.6918[.000]
 Mean of Dependent Variable   6.7066   S.D. of Dependent Variable   .35706
 Residual Sum of Squares      .28674   Equation Log-likelihood      6.3456
 Akaike Info. Criterion       4.3456   Schwarz Bayesian Criterion   3.7807
 DW-statistic                 1.0684
*******************************************************************************


                          Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version        *         F Version          *
*******************************************************************************
*                     *                          *                            *
* A:Serial Correlation*CHSQ(   1)=   2.5579[.110]*F(   1,  10)=   2.4495[.149]*
*                     *                          *                            *
* B:Functional Form   *CHSQ(   1)=   2.7607[.097]*F(   1,  10)=   2.6961[.132]*
*                     *                          *                            *
* C:Normality         *CHSQ(   2)=   2.0729[.355]*       Not applicable       *
*                     *                          *                            *
* D:Heteroscedasticity*CHSQ(   1)= .0034334[.953]*F(   1,  11)= .0029060[.958]*
*******************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values
```



Ordinary Least Squares Estimation
****
Dependent variable is LK
13 observations used for estimation from 2002 to 2014
****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
CON	2.8397	.51454	5.5188[.000]
LB	.70742	.12264	5.7685[.000]

****

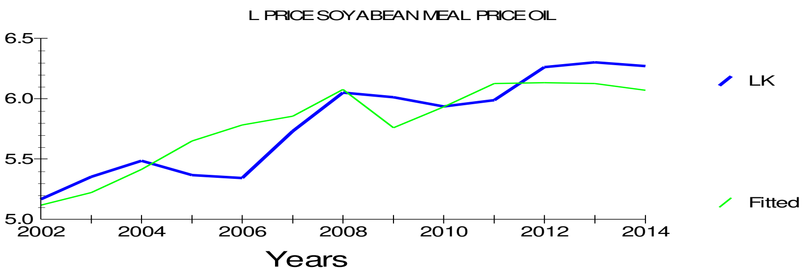
R-Squared	.75155	R-Bar-Squared	.72897
S.E. of Regression	.20978	F-stat. F(1, 11)	33.2754[.000]
Mean of Dependent Variable	5.7887	S.D. of Dependent Variable	.40296
Residual Sum of Squares	.48410	Equation Log-likelihood	2.9415
Akaike Info. Criterion	.94146	Schwarz Bayesian Criterion	.37651
DW-statistic	1.0385		

****

Diagnostic Tests
****

Test Statistics	LM Version	F Version
A:Serial Correlation	CHSQ(1)= 2.7430[.098]	F(1, 10)= 2.6743[.133]
B:Functional Form	CHSQ(1)= 2.2954[.130]	F(1, 10)= 2.1443[.174]
C:Normality	CHSQ(2)= 1.5091[.470]	Not applicable
D:Heteroscedasticity	CHSQ(1)= .0058648[.939]	F(1, 11)= .0049648[.945]

****
A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values



Ordinary Least Squares Estimation

****

Dependent variable is LP

13 observations used for estimation from 2002 to 2014

****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
CON	2.7787	.46523	5.9726[.000]
LB	.52678	.11088	4.7507[.001]

****

R-Squared	.67232	R-Bar-Squared	.64253
S.E. of Regression	.18968	F-stat. F(1, 11)	22.5692[.001]
Mean of Dependent Variable	4.9747	S.D. of Dependent Variable	.31725
Residual Sum of Squares	.39577	Equation Log-likelihood	4.2510
Akaike Info. Criterion	2.2510	Schwarz Bayesian Criterion	1.6860
DW-statistic	1.1477		

****

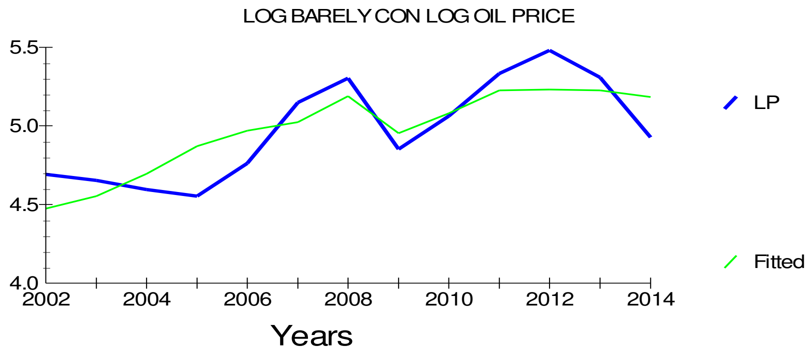
Diagnostic Tests

****

Test Statistics	LM Version	F Version
A:Serial Correlation	CHSQ(1)= 1.2752[.259]	F(1, 10)= 1.0876[.322]
B:Functional Form	CHSQ(1)= 6.2944[.012]	F(1, 10)= 9.3868[.012]
C:Normality	CHSQ(2)= .96211[.618]	Not applicable
D:Heteroscedasticity	CHSQ(1)= .021271[.884]	F(1, 11)= .018028[.896]

****

A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values



Ordinary Least Squares Estimation

****

Dependent variable is LR

13 observations used for estimation from 2002 to 2014

****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
CON	2.0623	.47567	4.3357[.001]
LB	.73060	.11337	6.4444[.000]

****

R-Squared	.79059	R-Bar-Squared	.77156
S.E. of Regression	.19394	F-stat. F(1, 11)	41.5298[.000]
Mean of Dependent Variable	5.1081	S.D. of Dependent Variable	.40576
Residual Sum of Squares	.41372	Equation Log-likelihood	3.9626
Akaike Info. Criterion	1.9626	Schwarz Bayesian Criterion	1.3977
DW-statistic	.85863		

****

Diagnostic Tests

****

Test Statistics	LM Version	F Version
A:Serial Correlation	CHSQ(1)= 3.5386[.060]	F(1, 10)= 3.7400[.082]
B:Functional Form	CHSQ(1)= 7.5932[.006]	F(1, 10)= 14.0436[.004]
C:Normality	CHSQ(2)= .95450[.620]	Not applicable
D:Heteroscedasticity	CHSQ(1)= .029831[.863]	F(1, 11)= .025300[.877]

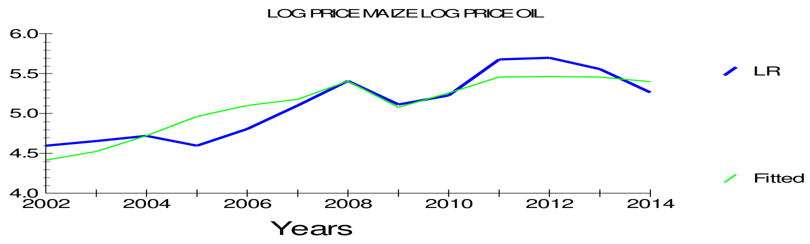
****

A:Lagrange multiplier test of residual serial correlation

B:Ramsey's RESET test using the square of the fitted values

C:Based on a test of skewness and kurtosis of residuals

D:Based on the regression of squared residuals on squared fitted values



Ordinary Least Squares Estimation

****

Dependent variable is LT

13 observations used for estimation from 2002 to 2014

****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
CON	2.2597	.44847	5.0387[.000]
LB	.67498	.10689	6.3149[.000]

****

R-Squared	.78379	R-Bar-Squared	.76414
S.E. of Regression	.18284	F-stat. F(1, 11)	39.8775[.000]
Mean of Dependent Variable	5.0735	S.D. of Dependent Variable	.37649
Residual Sum of Squares	.36775	Equation Log-likelihood	4.7282
Akaike Info. Criterion	2.7282	Schwarz Bayesian Criterion	2.1632
DW-statistic	.91813		

****

Diagnostic Tests

****

Test Statistics	LM Version	F Version
A:Serial Correlation	CHSQ(1)= 3.1479[.076]	F(1, 10)= 3.1951[.104]
B:Functional Form	CHSQ(1)= 9.3024[.002]	F(1, 10)= 25.1575[.001]
C:Normality	CHSQ(2)= 1.0669[.587]	Not applicable
D:Heteroscedasticity	CHSQ(1)= .28397[.594]	F(1, 11)= .24565[.630]

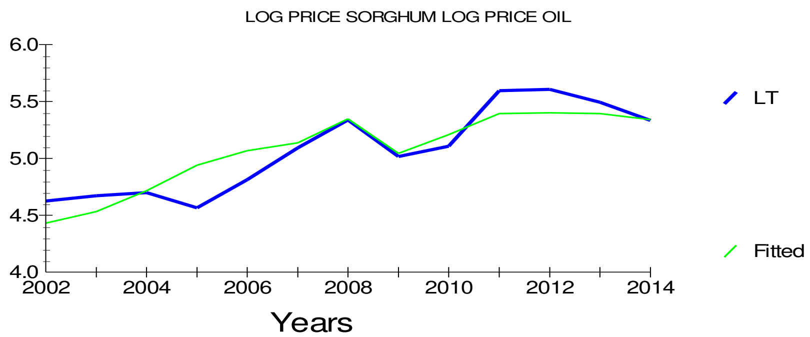
****

A:Lagrange multiplier test of residual serial correlation

B:Ramsey's RESET test using the square of the fitted values

C:Based on a test of skewness and kurtosis of residuals

D:Based on the regression of squared residuals on squared fitted values



Ordinary Least Squares Estimation

****

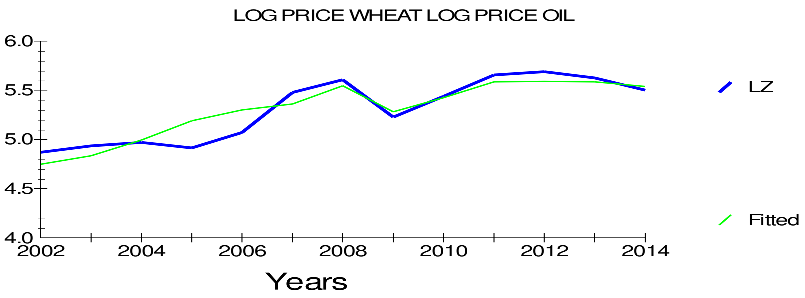
Dependent variable is LZ

13 observations used for estimation from 2002 to 2014

****

```
 Regressor           Coefficient       Standard Error         T-Ratio[Prob]
 CON                    2.8540            .32424            8.8020[.000]
 LB                   .58800           .077280           7.6086[.000]
*******************************************************************************
 R-Squared                    .84033   R-Bar-Squared                 .82581
 S.E. of Regression          .13220   F-stat.    F(  1,  11)   57.8910[.000]
 Mean of Dependent Variable   5.3052   S.D. of Dependent Variable      .31675
 Residual Sum of Squares       .19224   Equation Log-likelihood          8.9446
 Akaike Info. Criterion        6.9446   Schwarz Bayesian Criterion      6.3796
 DW-statistic                  1.2278
*******************************************************************************
```

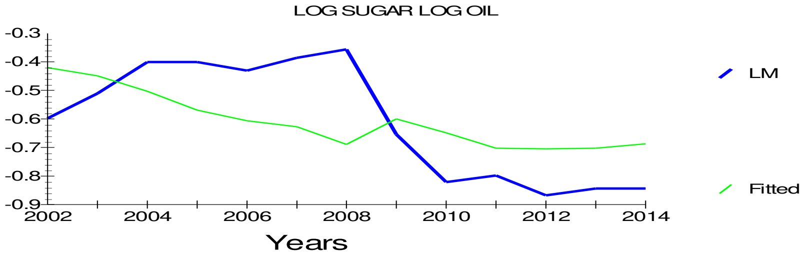
```
                        Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version         *         F Version          *
*******************************************************************************
*                    *                         *                         *
* A:Serial Correlation*CHSQ(   1)=   1.5581[.212]*F(   1,  10)=   1.3617[.270]*
*                    *                         *                         *
* B:Functional Form   *CHSQ(   1)=   6.2784[.012]*F(   1,  10)=   9.3406[.012]*
*                    *                         *                         *
* C:Normality         *CHSQ(   2)=   3.0466[.218]*       Not applicable       *
*                    *                         *                         *
* D:Heteroscedasticity*CHSQ(   1)=   .55953[.454]*F(   1,  11)=   .49474[.496]*
*******************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values
```



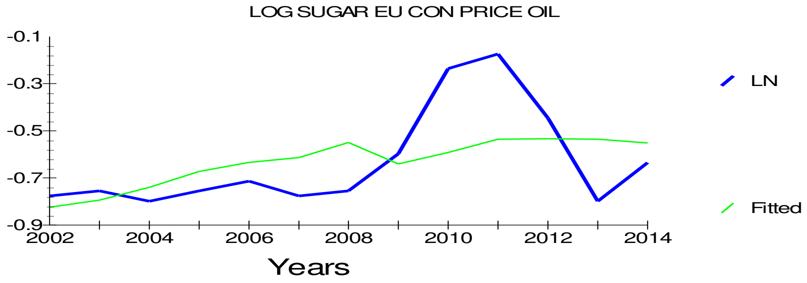

```
                  Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is LM
 13 observations used for estimation from 2002 to 2014
*******************************************************************************
 Regressor           Coefficient       Standard Error         T-Ratio[Prob]
 CON                    .21873            .45999            .47551[.644]
 LB                   -.19846            .10963           -1.8102[.098]
*******************************************************************************
 R-Squared                    .22951   R-Bar-Squared                 .15947
 S.E. of Regression          .18754   F-stat.    F(  1,  11)    3.2767[.098]
 Mean of Dependent Variable   -.60858   S.D. of Dependent Variable      .20456
 Residual Sum of Squares       .38690   Equation Log-likelihood          4.3984
 Akaike Info. Criterion        2.3984   Schwarz Bayesian Criterion      1.8334
 DW-statistic                  .59917
*******************************************************************************
```

```
                        Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version         *         F Version          *
*******************************************************************************
*                    *                         *                         *
```

```
* A:Serial Correlation*CHSQ(   1)=   5.5019[.019]*F(   1,  10)=   7.3377[.022]*
*                    *                     *                        *
* B:Functional Form   *CHSQ(   1)=   3.7654[.052]*F(   1,  10)=   4.0775[.071]*
*                    *                     *                        *
* C:Normality        *CHSQ(   2)=   1.4752[.478]*      Not applicable       *
*                    *                     *                        *
* D:Heteroscedasticity*CHSQ(   1)=   1.0667[.302]*F(   1,  11)=   .98329[.343]*
*******************************************************************************
  A:Lagrange multiplier test of residual serial correlation
  B:Ramsey's RESET test using the square of the fitted values
  C:Based on a test of skewness and kurtosis of residuals
  D:Based on the regression of squared residuals on squared fitted values
```




```
     Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is LN
 13 observations used for estimation from 2002 to 2014
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 CON                     -1.4749            .48595              -3.0351[.011]
 LB                       .20216            .11582               1.7455[.109]
*******************************************************************************
 R-Squared                     .21690   R-Bar-Squared                   .14571
 S.E. of Regression            .19813   F-stat.    F(  1,  11)    3.0468[.109]
 Mean of Dependent Variable   -.63212   S.D. of Dependent Variable      .21436
 Residual Sum of Squares       .43179   Equation Log-likelihood         3.6847
 Akaike Info. Criterion        1.6847   Schwarz Bayesian Criterion      1.1198
 DW-statistic                  .94617
*******************************************************************************


                          Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version        *         F Version          *
*******************************************************************************
*                    *                     *                        *
* A:Serial Correlation*CHSQ(   1)=   3.6203[.057]*F(   1,  10)=   3.8597[.078]*
*                    *                     *                        *
* B:Functional Form   *CHSQ(   1)=   .20978[.647]*F(   1,  10)=   .16401[.694]*
*                    *                     *                        *
* C:Normality        *CHSQ(   2)=   1.2903[.525]*      Not applicable       *
*                    *                     *                        *
* D:Heteroscedasticity*CHSQ(   1)=   3.1633[.075]*F(   1,  11)=   3.5374[.087]*
*******************************************************************************
  A:Lagrange multiplier test of residual serial correlation
  B:Ramsey's RESET test using the square of the fitted values
  C:Based on a test of skewness and kurtosis of residuals
  D:Based on the regression of squared residuals on squared fitted values
```

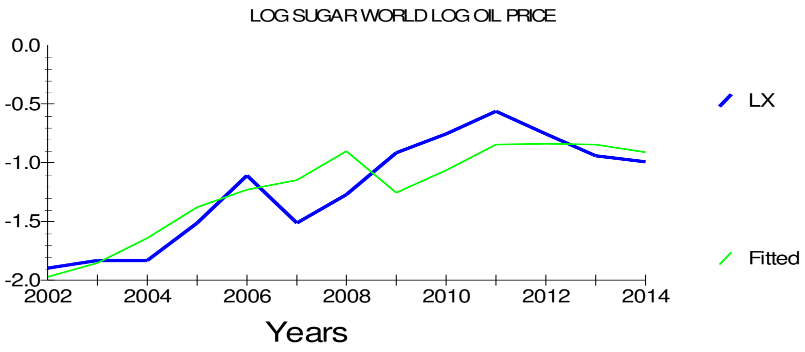


Ordinary Least Squares Estimation

```
*******************************************************************************
 Dependent variable is LX
 13 observations used for estimation from 2002 to 2014
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 CON                      -4.5117            .60158             -7.4997[.000]
 LB                        .78893            .14338              5.5023[.000]
*******************************************************************************
 R-Squared                    .73350   R-Bar-Squared                   .70927
 S.E. of Regression           .24527   F-stat.    F(  1,  11)   30.2754[.000]
 Mean of Dependent Variable  -1.2228   S.D. of Dependent Variable      .45488
 Residual Sum of Squares      .66174   Equation Log-likelihood         .90973
 Akaike Info. Criterion      -1.0903   Schwarz Bayesian Criterion     -1.6552
 DW-statistic                 1.4090
*******************************************************************************
```

Diagnostic Tests

```
*******************************************************************************
*    Test Statistics  *        LM Version         *         F Version         *
*******************************************************************************
*                     *                           *                           *
* A:Serial Correlation*CHSQ(   1)=   1.0989[.295]*F(   1,  10)=   .92333[.359]*
*                     *                           *                           *
* B:Functional Form   *CHSQ(   1)=  .020297[.887]*F(   1,  10)=  .015638[.903]*
*                     *                           *                           *
* C:Normality         *CHSQ(   2)=   .55099[.759]*       Not applicable       *
*                     *                           *                           *
* D:Heteroscedasticity*CHSQ(   1)=   1.7217[.189]*F(   1,  11)=   1.6792[.222]*
*******************************************************************************
  A:Lagrange multiplier test of residual serial correlation
  B:Ramsey's RESET test using the square of the fitted values
  C:Based on a test of skewness and kurtosis of residuals
  D:Based on the regression of squared residuals on squared fitted values
```

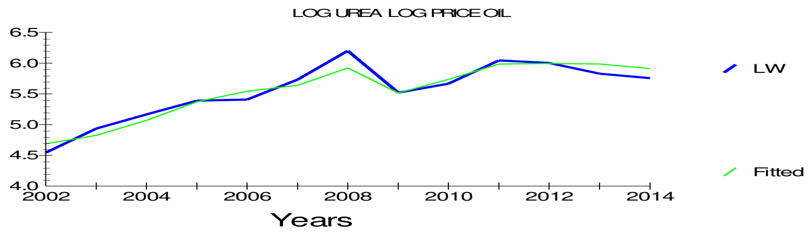


Ordinary Least Squares Estimation

```
*******************************************************************************
Dependent variable is LW
13 observations used for estimation from 2002 to 2014
*******************************************************************************
Regressor           Coefficient       Standard Error         T-Ratio[Prob]
CON                  1.7609            .33505             5.2556[.000]
LB                  .90970            .079856            11.3917[.000]
*******************************************************************************
R-Squared                  .92186   R-Bar-Squared                .91475
S.E. of Regression          .13660   F-stat.   F(  1,  11)  129.7705[.000]
Mean of Dependent Variable   5.5532   S.D. of Dependent Variable     .46787
Residual Sum of Squares      .20527   Equation Log-likelihood        8.5184
Akaike Info. Criterion       6.5184   Schwarz Bayesian Criterion     5.9534
DW-statistic                1.5018
*******************************************************************************
```

Diagnostic Tests

```
*******************************************************************************
*    Test Statistics  *        LM Version        *          F Version          *
*******************************************************************************
*                     *                          *                             *
* A:Serial Correlation*CHSQ(   1)=   .28057[.596]*F(   1,  10)=   .22059[.649]*
*                     *                          *                             *
* B:Functional Form   *CHSQ(   1)=   .15899[.690]*F(   1,  10)=   .12382[.732]*
*                     *                          *                             *
* C:Normality         *CHSQ(   2)=   .48941[.783]*       Not applicable        *
*                     *                          *                             *
* D:Heteroscedasticity*CHSQ(   1)=   .44049[.507]*F(   1,  11)=   .38580[.547]*
*******************************************************************************
  A:Lagrange multiplier test of residual serial correlation
  B:Ramsey's RESET test using the square of the fitted values
  C:Based on a test of skewness and kurtosis of residuals
  D:Based on the regression of squared residuals on squared fitted values
```



Unit root tests for variable LW
The Dickey-Fuller regressions include an intercept but not a trend
****
8 observations used in the estimation of all ADF regressions.
Sample period from 2007 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-.82851	8.2137	6.2137	6.1342	6.7495
ADF(1)	-.62911	8.2427	5.2427	5.1235	6.0464

****
95% critical value for the augmented Dickey-Fuller statistic = -3.3353
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LW
The Dickey-Fuller regressions include an intercept and a linear trend
****
8 observations used in the estimation of all ADF regressions.
Sample period from 2007 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.0256	10.1821	7.1821	7.0630	7.9858
ADF(1)	-2.2234	11.1638	7.1638	7.0049	8.2354

****
95% critical value for the augmented Dickey-Fuller statistic = -4.1961
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LE
The Dickey-Fuller regressions include an intercept but not a trend
****
8 observations used in the estimation of all ADF regressions.
Sample period from 2007 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-10.7387	60.0183	58.0183	57.9389	58.5541
ADF(1)	-2.5691	66.7571	63.7571	63.6379	64.5608

****
95% critical value for the augmented Dickey-Fuller statistic = -3.3353
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LE
The Dickey-Fuller regressions include an intercept and a linear trend
****
8 observations used in the estimation of all ADF regressions.
Sample period from 2007 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-3.4713	64.2055	61.2055	61.0863	62.0092
ADF(1)	1.1176	67.9455	63.9455	63.7866	65.0171

****
95% critical value for the augmented Dickey-Fuller statistic = -4.1961
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

```
                  Unit root tests for variable LR
    The Dickey-Fuller regressions include an intercept but not a trend
********************************************************************************
 8 observations used in the estimation of all ADF regressions.
 Sample period from 2007 to 2014
********************************************************************************
      Test Statistic     LL        AIC        SBC        HQC
 DF        3.8710     54.0033     52.0033     51.9239     52.5391
 ADF(1)    -.75891     63.6027     60.6027     60.4836     61.4064
********************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.3353
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion


                  Unit root tests for variable LR
   The Dickey-Fuller regressions include an intercept and a linear trend
********************************************************************************
 8 observations used in the estimation of all ADF regressions.
 Sample period from 2007 to 2014
********************************************************************************
      Test Statistic     LL        AIC        SBC        HQC
 DF       -11.0880     67.3485     64.3485     64.2294     65.1522
 ADF(1)    -2.5432     67.4143     63.4143     63.2554     64.4859
********************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -4.1961
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion


                  Unit root tests for variable LT
    The Dickey-Fuller regressions include an intercept but not a trend
********************************************************************************
 8 observations used in the estimation of all ADF regressions.
 Sample period from 2007 to 2014
********************************************************************************
      Test Statistic     LL        AIC        SBC        HQC
 DF       -2.3066      4.2797      2.2797      2.2003      2.8155
 ADF(1)    -1.7748      4.3975      1.3975      1.2784      2.2012
********************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.3353
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion


                  Unit root tests for variable LT
   The Dickey-Fuller regressions include an intercept and a linear trend
********************************************************************************
 8 observations used in the estimation of all ADF regressions.
 Sample period from 2007 to 2014
********************************************************************************
      Test Statistic     LL        AIC        SBC        HQC
 DF       -2.3061      4.7275      1.7275      1.6083      2.5312
 ADF(1)    -1.7286      4.8512      .85116      .69227      1.9228
********************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -4.1961
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                Unit root tests for variable LZ
    The Dickey-Fuller regressions include an intercept but not a trend
********************************************************************************
 8 observations used in the estimation of all ADF regressions.
 Sample period from 2007 to 2014
********************************************************************************
      Test Statistic     LL         AIC         SBC         HQC
 DF        -.98799    -21.2961    -23.2961    -23.3755    -22.7603
 ADF(1)    -.86850    -21.2833    -24.2833    -24.4025    -23.4796
********************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.3353
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                Unit root tests for variable LZ
   The Dickey-Fuller regressions include an intercept and a linear trend
********************************************************************************
 8 observations used in the estimation of all ADF regressions.
 Sample period from 2007 to 2014
********************************************************************************
      Test Statistic     LL         AIC         SBC         HQC
 DF        -1.8632    -19.7748    -22.7748    -22.8939    -21.9711
 ADF(1)    -2.0030    -19.0597    -23.0597    -23.2186    -21.9881
********************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -4.1961
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                Unit root tests for variable LII
    The Dickey-Fuller regressions include an intercept but not a trend
********************************************************************************
 8 observations used in the estimation of all ADF regressions.
 Sample period from 2007 to 2014
********************************************************************************
      Test Statistic     LL         AIC         SBC         HQC
 DF        -1.2066     -9.6373    -11.6373    -11.7168    -11.1015
 ADF(1)    -1.2233     -9.4304    -12.4304    -12.5495    -11.6267
********************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -3.3353
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
                Unit root tests for variable LII
   The Dickey-Fuller regressions include an intercept and a linear trend
********************************************************************************
 8 observations used in the estimation of all ADF regressions.
 Sample period from 2007 to 2014
********************************************************************************
      Test Statistic     LL         AIC         SBC         HQC
 DF         .23965     -8.6792    -11.6792    -11.7984    -10.8755
 ADF(1)     .49676     -8.4704    -12.4704    -12.6293    -11.3988
********************************************************************************
 95% critical value for the augmented Dickey-Fuller statistic =  -4.1961
 LL  = Maximized log-likelihood      AIC = Akaike Information Criterion
 SBC = Schwarz Bayesian Criterion    HQC = Hannan-Quinn Criterion
```

```
   Unit root tests for variable LOO
    The Dickey-Fuller regressions include an intercept but not a trend
********************************************************************************
 8 observations used in the estimation of all ADF regressions.
 Sample period from 2007 to 2014
********************************************************************************
      Test Statistic     LL         AIC         SBC         HQC
 DF        -2.8254      4.6419      2.6419      2.5625      3.1777
 ADF(1)    -2.5875      4.8864      1.8864      1.7672      2.6901
********************************************************************************
```

95% critical value for the augmented Dickey-Fuller statistic = -3.3353
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LOO
The Dickey-Fuller regressions include an intercept and a linear trend
****
8 observations used in the estimation of all ADF regressions.
Sample period from 2007 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-3.2703	6.5539	3.5539	3.4347	4.3576
ADF(1)	-2.9288	6.5609	2.5609	2.4020	3.6325

****
95% critical value for the augmented Dickey-Fuller statistic = -4.1961
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LP
The Dickey-Fuller regressions include an intercept but not a trend
****
8 observations used in the estimation of all ADF regressions.
Sample period from 2007 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.1370	4.8970	2.8970	2.8176	3.4328
ADF(1)	-.42769	5.0097	2.0097	1.8905	2.8134

****
95% critical value for the augmented Dickey-Fuller statistic = -3.3353
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LP
The Dickey-Fuller regressions include an intercept and a linear trend
****
8 observations used in the estimation of all ADF regressions.
Sample period from 2007 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.4678	7.3053	4.3053	4.1861	5.1090
ADF(1)	-2.7660	9.2296	5.2296	5.0707	6.3012

****
95% critical value for the augmented Dickey-Fuller statistic = -4.1961
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LA
The Dickey-Fuller regressions include an intercept but not a trend
****
8 observations used in the estimation of all ADF regressions.
Sample period from 2007 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.3488	4.2296	2.2296	2.1501	2.7654
ADF(1)	-1.7044	4.2411	1.2411	1.1219	2.0448

****
95% critical value for the augmented Dickey-Fuller statistic = -3.3353
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LA
The Dickey-Fuller regressions include an intercept and a linear trend
****
8 observations used in the estimation of all ADF regressions.
Sample period from 2007 to 2014
****

Test Statistic		LL	AIC	SBC	HQC
DF	-2.2678	4.5992	1.5992	1.4800	2.4029
ADF(1)	-1.6164	4.6797	.67974	.52085	1.7513

****

95% critical value for the augmented Dickey-Fuller statistic = -4.1961
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LS
The Dickey-Fuller regressions include an intercept but not a trend

****

8 observations used in the estimation of all ADF regressions.
Sample period from 2007 to 2014

****

Test Statistic		LL	AIC	SBC	HQC
DF	-1.0476	9.7793	7.7793	7.6999	8.3151
ADF(1)	-.51923	9.8027	6.8027	6.6835	7.6064

****

95% critical value for the augmented Dickey-Fuller statistic = -3.3353
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LS
The Dickey-Fuller regressions include an intercept and a linear trend

****

8 observations used in the estimation of all ADF regressions.
Sample period from 2007 to 2014

****

Test Statistic		LL	AIC	SBC	HQC
DF	-2.5216	12.7066	9.7066	9.5874	10.5103
ADF(1)	-2.2462	13.4760	9.4760	9.3171	10.5476

****

95% critical value for the augmented Dickey-Fuller statistic = -4.1961
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LD
The Dickey-Fuller regressions include an intercept but not a trend

****

8 observations used in the estimation of all ADF regressions.
Sample period from 2007 to 2014

****

Test Statistic		LL	AIC	SBC	HQC
DF	-2.5935	7.7902	5.7902	5.7108	6.3260
ADF(1)	-2.5253	8.5529	5.5529	5.4337	6.3566

****

95% critical value for the augmented Dickey-Fuller statistic = -3.3353
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LD
The Dickey-Fuller regressions include an intercept and a linear trend

****

8 observations used in the estimation of all ADF regressions.
Sample period from 2007 to 2014

****

Test Statistic		LL	AIC	SBC	HQC
DF	-2.3953	7.8600	4.8600	4.7408	5.6637
ADF(1)	-2.4328	8.9301	4.9301	4.7712	6.0017

****

95% critical value for the augmented Dickey-Fuller statistic = -4.1961
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LF
The Dickey-Fuller regressions include an intercept but not a trend
****
8 observations used in the estimation of all ADF regressions.
Sample period from 2007 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-.75244	-23.2260	-25.2260	-25.3055	-24.6902
ADF(1)	-.59431	-23.2257	-26.2257	-26.3449	-25.4220

****
95% critical value for the augmented Dickey-Fuller statistic = -3.3353
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LF
The Dickey-Fuller regressions include an intercept and a linear trend
****
8 observations used in the estimation of all ADF regressions.
Sample period from 2007 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.0662	-21.1005	-24.1005	-24.2196	-23.2968
ADF(1)	-2.0279	-20.6269	-24.6269	-24.7858	-23.5553

****
95% critical value for the augmented Dickey-Fuller statistic = -4.1961
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LH
The Dickey-Fuller regressions include an intercept but not a trend
****
8 observations used in the estimation of all ADF regressions.
Sample period from 2007 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.2822	14.4107	12.4107	12.3313	12.9465
ADF(1)	-1.7969	15.4476	12.4476	12.3284	13.2513

****
95% critical value for the augmented Dickey-Fuller statistic = -3.3353
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LH
The Dickey-Fuller regressions include an intercept and a linear trend
****
8 observations used in the estimation of all ADF regressions.
Sample period from 2007 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.4937	15.0354	12.0354	11.9163	12.8391
ADF(1)	-1.5788	15.6221	11.6221	11.4632	12.6937

****
95% critical value for the augmented Dickey-Fuller statistic = -4.1961
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LJ
The Dickey-Fuller regressions include an intercept but not a trend
****
8 observations used in the estimation of all ADF regressions.
Sample period from 2007 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-2.0876	-21.2310	-23.2310	-23.3105	-22.6952
ADF(1)	-1.8555	-21.2306	-24.2306	-24.3498	-23.4269

****
95% critical value for the augmented Dickey-Fuller statistic = -3.3353
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Unit root tests for variable LJ
The Dickey-Fuller regressions include an intercept and a linear trend
****
8 observations used in the estimation of all ADF regressions.
Sample period from 2007 to 2014
****

	Test Statistic	LL	AIC	SBC	HQC
DF	-1.6000	-21.0862	-24.0862	-24.2053	-23.2825
ADF(1)	-1.3402	-20.9634	-24.9634	-25.1222	-23.8918

****
95% critical value for the augmented Dickey-Fuller statistic = -4.1961
LL = Maximized log-likelihood AIC = Akaike Information Criterion
SBC = Schwarz Bayesian Criterion HQC = Hannan-Quinn Criterion

Sample period :2005 to 2013

Variable(s) :	LW	LE	LR	LT	LZ	LU
Maximum :	2.2300	19.1349	17.2923	2.1827	21.2507	2.0242
Minimum :	1.7750	19.0545	17.2263	1.7699	10.0031	.56531
Mean :	2.0087	19.0963	17.2608	1.9841	15.9743	*NONE*
Std. Deviation :	.15559	.027337	.022905	.14432	5.6236	*NONE*
Skewness :	-.26777	-.096296	-.11123	.035192	-.18596	*NONE*
Kurtosis - 3 :	-1.1929	-1.1960	-1.2637	-1.3236	-1.9231	*NONE*
Coef of Variation:	.077456	.0014315	.0013270	.072738	.35204	*NONE*

Sample period :2005 to 2013

Variable(s) :	LII	LOO	LP	LA	LS	LD
Maximum :	-1.3471	4.0142	4.0142	1.1756	3.0732	2.9684
Minimum :	-2.6593	2.0554	3.3102	.67803	2.9096	2.6504
Mean :	-2.1153	2.4883	3.7506	.94194	3.0063	2.8525
Std. Deviation :	.57565	.60218	.20499	.17553	.063236	.091310
Skewness :	.31784	2.0352	-.98244	-.11367	-.62162	-.97207
Kurtosis - 3 :	-1.6806	2.8845	.51226	-1.2511	-1.3285	.97790
Coef of Variation:	.27213	.24201	.054654	.18634	.021035	.032010

Sample period :2005 to 2013

Variable(s) :	LF	LG	LH	LJ	LK	LL
Maximum :	20.8590	2.0643	1.7281	21.4038	2.2502	2.8582
Minimum :	6.0267	-.40048	1.5790	7.6894	.46373	2.4458
Mean :	11.2474	*NONE*	1.6589	12.2852	*NONE*	2.6968
Std. Deviation :	7.1960	*NONE*	.043102	6.6824	*NONE*	.15226
Skewness :	.70364	*NONE*	-.20026	.70710	*NONE*	-.72422
Kurtosis - 3 :	-1.4999	*NONE*	-.24346	-1.4979	*NONE*	-.94305
Coef of Variation:	.63979	*NONE*	.025983	.54394	*NONE*	.056462

Sample period :2005 to 2013

Variable(s) :	LY	LX	LC	LV	LB	LN
Maximum :	8.7061	8.3605	3.3541	21.1322	1.7029	4.2485
Minimum :	7.6815	8.0269	3.1938	8.5157	-.040822	4.1897
Mean :	8.2693	8.2145	3.2861	14.3191	1.0684	4.2194
Std. Deviation :	.34473	.11598	.050788	6.4000	.57144	.018016
Skewness :	-.43139	-.32053	-.60284	.22064	-.75707	-.031849
Kurtosis - 3 :	-1.0249	-1.1725	-.73173	-1.9469	-.51515	-.74881
Coef of Variation:	.041688	.014118	.015456	.44696	.53484	.0042698

Sample period :2005 to 2013

Variable(s)	LM	LAA	LSS	LDD	LFF	LGG
Maximum	5.4681	6.0568	5.2730	3.5346	2.4006	6.1420
Minimum	4.6913	4.8828	5.1358	3.2205	1.7884	5.3706
Mean	5.1539	5.5951	5.2285	3.3834	2.1631	5.8103
Std. Deviation	.27529	.42202	.043273	.12159	.19593	.27486
Skewness	-.43010	-.47023	-1.1545	-.060587	-.59347	-.24415
Kurtosis - 3	-1.1607	-1.1306	.31943	-1.5278	-.54843	-1.2879
Coef of Variation	.053414	.075428	.0082764	.035936	.090578	.047306

Sample period :2005 to 2013

Variable(s)	LHH	LJJ	LKK	LLL	LYY	LXX
Maximum	21.4486	1.9865	3.8941	1.0502	7.2385	15.5756
Minimum	5.4739	1.2238	3.7757	.89438	7.0405	15.3845
Mean	12.6784	1.6430	3.8347	.99060	7.1503	15.4738
Std. Deviation	8.1243	.30146	.039121	.057677	.074437	.063047
Skewness	.22317	-.14326	-.38685	-.76681	-.15528	.33242
Kurtosis - 3	-1.9479	-1.5313	-.76175	-.89707	-1.4150	-1.0420
Coef of Variation	.64080	.18348	.010202	.058224	.010410	.0040744

Sample period :2005 to 2013

Variable(s)	LCC	LVV	LQQ	LWW	LEE	LRR
Maximum	21.2966	21.0166	21.3766	4.3233	2.9161	20.7424
Minimum	3.7414	4.0601	10.0147	2.1861	1.5369	2.1872
Mean	8.2938	11.6343	15.1176	3.9720	1.7955	4.7624
Std. Deviation	7.2558	8.7754	5.7047	.67648	.44212	5.9968
Skewness	1.3120	.22326	.22287	-2.3810	2.0837	2.4679
Kurtosis - 3	-.23755	-1.9490	-1.9450	3.8598	2.8585	4.1058
Coef of Variation	.87485	.75427	.37735	.17031	.24624	1.2592

Sample period :2005 to 2013

Variable(s)	LTT	LZZ	LUU	LIII
Maximum	21.4073	4.7822	4.3611	4.8101
Minimum	4.3765	1.9272	1.2920	2.8696
Mean	14.4580	4.2935	1.9362	4.4030
Std. Deviation	6.6245	.89558	.92818	.59274

Sample period :2005 to 2013

Variable(s)	LTT	LZZ	LUU	LIII
Maximum	21.4073	4.7822	4.3611	4.8101
Minimum	4.3765	1.9272	1.2920	2.8696
Mean	14.4580	4.2935	1.9362	4.4030
Std. Deviation	6.6245	.89558	.92818	.59274
Skewness	-.051535	-2.3878	2.2817	-2.1998
Kurtosis - 3	-1.5656	3.8816	3.6019	3.3574
Coef of Variation	.45819	.20859	.47939	.13462

Estimated Correlation Matrix of Variables

****

	LW	LE	LR	LT	LZ	LU
LW	1.0000	-.89259	.89746	.23138	.68872	*NONE*
LE	-.89259	1.0000	-.99653	-.13324	-.80960	*NONE*
LR	.89746	-.99653	1.0000	.16275	.83432	*NONE*
LT	.23138	-.13324	.16275	1.0000	.045985	*NONE*
LZ	.68872	-.80960	.83432	.045985	1.0000	*NONE*
LII	.59206	-.87065	.86224	.12341	.80411	*NONE*
LOO	.66078	-.75776	.70985	.16657	.39083	*NONE*

LP	.81490	-.87490	.88463	.36148	.68134	*NONE*
LA	.20329	-.61681	.59924	-.012062	.49048	*NONE*
LS	.43510	-.59706	.61854	.51880	.33178	*NONE*
LD	-.25901	.18697	-.19836	.23526	-.60339	*NONE*
LF	-.87965	.82555	-.85430	-.31704	-.79032	*NONE*
LH	-.27595	.037868	-.082780	-.29878	.15396	*NONE*
LJ	.67734	-.82750	.80402	-.31252	.57232	*NONE*
LL	.89217	-.93163	.95304	.41366	.81247	*NONE*
LY	-.80329	.92154	-.89896	.14234	-.79233	*NONE*
LX	-.89167	.98002	-.96936	-.025174	-.82002	*NONE*
LC	.74398	-.81792	.82070	.49734	.44586	*NONE*
LV	-.74900	.87254	-.88714	-.040367	-.98926	*NONE*
LB	.19620	-.31126	.32506	.43317	-.028585	*NONE*
LN	-.70410	.86014	-.85057	-.42156	-.52054	*NONE*
LM	-.89308	.94321	-.92818	.048470	-.79716	*NONE*
LAA	-.91194	.94511	-.92869	.055677	-.75820	*NONE*
LSS	-.60698	.35173	-.35283	-.19385	-.40709	*NONE*
LDD	-.61344	.86799	-.86130	-.071111	-.59713	*NONE*
LFF	-.50871	.60429	-.55246	.17490	-.43792	*NONE*
LGG	-.92338	.91938	-.90804	.034733	-.78809	*NONE*
LHH	.55455	-.85539	.85327	.024882	.76163	*NONE*
LJJ	-.82541	.98133	-.97737	-.073027	-.87210	*NONE*
LKK	.77435	-.61588	.66784	.44263	.74935	*NONE*
LLL	.89213	-.92581	.94829	.42355	.80786	*NONE*
LYY	-.90862	.96003	-.95470	-.044914	-.85064	*NONE*
LXX	-.71846	.60677	-.66479	-.34303	-.77917	*NONE*
LCC	-.13535	.37526	-.35564	.55945	-.61750	*NONE*
LVV	-.90166	.69667	-.70440	.014716	-.52760	*NONE*
LQQ	.54253	-.84805	.84595	.019908	.76032	*NONE*
LWW	-.62526	.68062	-.62791	-.10357	-.31421	*NONE*
LEE	.58104	-.67380	.61526	.086629	.27074	*NONE*
LRR	.55221	-.59299	.53647	.087406	.22264	*NONE*
LTT	.17571	-.24845	.31180	-.029926	.68625	*NONE*
LZZ	-.62785	.67792	-.62571	-.096422	-.31782	*NONE*
LUU	.39569	-.43431	.37269	.14918	.074630	*NONE*

LIII	-.70181	.75255	-.70487	-.090127	-.39697	*NONE*

Estimated Correlation Matrix of Variables

****

	LII	LOO	LP	LA	LS	LD
LW	.59206	.66078	.81490	.20329	.43510	-.25901
LE	-.87065	-.75776	-.87490	-.61681	-.59706	.18697
LR	.86224	.70985	.88463	.59924	.61854	-.19836
LT	.12341	.16657	.36148	-.012062	.51880	.23526
LZ	.80411	.39083	.68134	.49048	.33178	-.60339
LII	1.0000	.68207	.68851	.85545	.56405	-.19814
LOO	.68207	1.0000	.68682	.52546	.39096	-.5371E-3
LP	.68851	.68682	1.0000	.50311	.65989	-.081874
LA	.85545	.52546	.50311	1.0000	.61051	.15673
LS	.56405	.39096	.65989	.61051	1.0000	.53031
LD	-.19814	-.5371E-3	-.081874	.15673	.53031	1.0000
LF	-.66791	-.41606	-.69499	-.26942	-.47302	.32920
LH	.31778	.26390	-.24764	.32936	-.37529	-.40460
LJ	.69014	.63126	.56861	.58910	.44928	-.011236
LL	.78556	.60500	.88771	.48326	.70891	-.15302
LY	-.84642	-.75956	-.68177	-.57013	-.27857	.40192
LX	-.83730	-.77217	-.84485	-.55788	-.43682	.32363
LC	.65552	.69734	.88154	.55613	.87559	.32042
LV	-.85071	-.51551	-.72768	-.53049	-.35216	.56906
LB	.29324	.18774	.29967	.43018	.89221	.78285
LN	-.79626	-.80334	-.89009	-.70886	-.79480	-.20059
LM	-.77529	-.76512	-.79667	-.46561	-.30700	.40989
LAA	-.75268	-.76436	-.77583	-.44348	-.32911	.34983
LSS	-.10682	-.34658	-.44123	.31359	.28652	.68576
LDD	-.84766	-.63605	-.74782	-.84209	-.79613	-.21061
LFF	-.63119	-.73174	-.25119	-.40091	-.021839	.29463
LGG	-.72967	-.71248	-.73128	-.36208	-.25694	.44913
LHH	.95892	.58451	.65041	.88352	.67105	-.043041
LJJ	-.91940	-.71950	-.82480	-.67506	-.53449	.28624
LKK	.39240	.17031	.65078	-.031425	.35988	-.44970
LLL	.77454	.59591	.88868	.47137	.71104	-.14969

LYY	-.79581	-.72262	-.82635	-.47331	-.39143	.40061
LXX	-.40558	-.066784	-.64500	-.039788	-.36731	.44992
LCC	-.59127	-.24346	-.077579	-.47832	.24853	.65687
LVV	-.32886	-.39348	-.52904	.067610	-.19536	.28545
LQQ	.95850	.57719	.64174	.88748	.66668	-.044791
LWW	-.59796	-.97860	-.57507	-.41569	-.27260	.029250
LEE	.61554	.97347	.57791	.49406	.26727	.018038
LRR	.51260	.95731	.51221	.35329	.20453	-.0095763
LTT	.30060	-.38074	.20465	.15468	.13049	-.50681
LZZ	-.58965	-.97578	-.57826	-.40292	-.26033	.044112
LUU	.40543	.90839	.39336	.29179	.12129	.034864
LIII	-.64169	-.98125	-.63996	-.43256	-.30874	.069073

Estimated Correlation Matrix of Variables

****

	LF	LG	LH	LJ	LK	LL
LW	-.87965	*NONE*	-.27595	.67734	*NONE*	.89217
LE	.82555	*NONE*	.037868	-.82750	*NONE*	-.93163
LR	-.85430	*NONE*	-.082780	.80402	*NONE*	.95304
LT	-.31704	*NONE*	-.29878	-.31252	*NONE*	.41366
LZ	-.79032	*NONE*	.15396	.57232	*NONE*	.81247
LU	*NONE*	*NONE*	*NONE*	*NONE*	*NONE*	*NONE*
LII	-.66791	*NONE*	.31778	.69014	*NONE*	.78556
LOO	-.41606	*NONE*	.26390	.63126	*NONE*	.60500
LP	-.69499	*NONE*	-.24764	.56861	*NONE*	.88771
LA	-.26942	*NONE*	.32936	.58910	*NONE*	.48326
LS	-.47302	*NONE*	-.37529	.44928	*NONE*	.70891
LD	.32920	*NONE*	-.40460	-.011236	*NONE*	-.15302
LF	1.0000	*NONE*	.25682	-.52114	*NONE*	-.90369
LH	.25682	*NONE*	1.0000	.023999	*NONE*	-.21569
LJ	-.52114	*NONE*	.023999	1.0000	*NONE*	.63783
LL	-.90369	*NONE*	-.21569	.63783	*NONE*	1.0000
LY	.71970	*NONE*	-.23722	-.84370	*NONE*	-.75225
LX	.78282	*NONE*	-.046437	-.82695	*NONE*	-.87061
LC	-.64701	*NONE*	-.36092	.59545	*NONE*	.85461

LV	.80619	*NONE*	-.18295	-.64480	*NONE*	-.84321
LB	-.25962	*NONE*	-.44231	.32366	*NONE*	.41904
LN	.62619	*NONE*	.12120	-.61148	*NONE*	-.83386
LM	.75797	*NONE*	-.078001	-.80582	*NONE*	-.81200
LAA	.76703	*NONE*	-.026802	-.84139	*NONE*	-.81230
LSS	.47435	*NONE*	.039994	-.014345	*NONE*	-.36716
LDD	.58162	*NONE*	.075963	-.84320	*NONE*	-.77798
LFF	.37001	*NONE*	-.54751	-.68255	*NONE*	-.39901
LGG	.82046	*NONE*	-.039281	-.77811	*NONE*	-.80966
LHH	-.63784	*NONE*	.19066	.78189	*NONE*	.77147
LJJ	.78722	*NONE*	-.099142	-.82364	*NONE*	-.89793
LKK	-.85816	*NONE*	-.37445	.25102	*NONE*	.80808
LLL	-.90321	*NONE*	-.23058	.62858	*NONE*	.99981
LYY	.79664	*NONE*	-.036401	-.79928	*NONE*	-.87634
LXX	.84208	*NONE*	.41932	-.27364	*NONE*	-.78374
LCC	.24651	*NONE*	-.69809	-.42108	*NONE*	-.16014
LVV	.79919	*NONE*	.39488	-.63956	*NONE*	-.67847
LQQ	-.62935	*NONE*	.20038	.77707	*NONE*	.76347
LWW	.38341	*NONE*	-.30582	-.57763	*NONE*	-.51504
LEE	-.33009	*NONE*	.29423	.58988	*NONE*	.47649
LRR	-.28955	*NONE*	.32930	.50103	*NONE*	.42197
LTT	-.45514	*NONE*	-.11967	.11447	*NONE*	.37738
LZZ	.38352	*NONE*	-.30405	-.57090	*NONE*	-.51245
LUU	-.12917	*NONE*	.40474	.33212	*NONE*	.27476
LIII	.46533	*NONE*	-.25366	-.64249	*NONE*	-.59115

Estimated Correlation Matrix of Variables

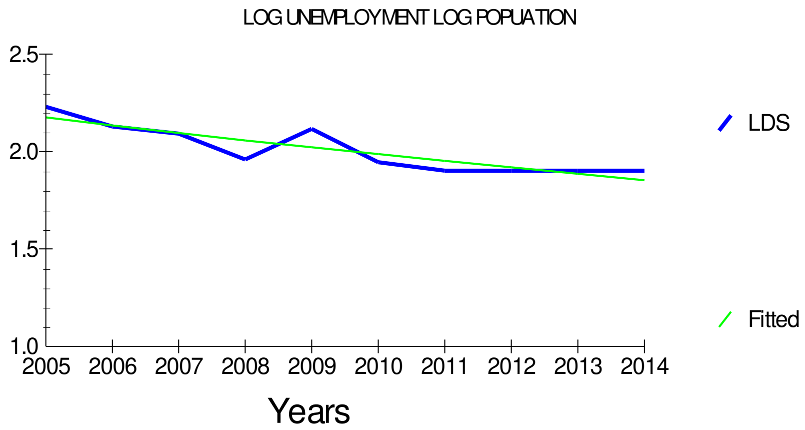
****

	LY	LX	LC	LV	LB	LN
LW	-.80329	-.89167	.74398	-.74900	.19620	-.70410
LE	.92154	.98002	-.81792	.87254	-.31126	.86014
LR	-.89896	-.96936	.82070	-.88714	.32506	-.85057
LT	.14234	-.025174	.49734	-.040367	.43317	-.42156
LZ	-.79233	-.82002	.44586	-.98926	-.028585	-.52054
LII	-.84642	-.83730	.65552	-.85071	.29324	-.79626
LOO	-.75956	-.77217	.69734	-.51551	.18774	-.80334
LP	-.68177	-.84485	.88154	-.72768	.29967	-.89009

LA	-.57013	-.55788	.55613	-.53049	.43018	-.70886
LS	-.27857	-.43682	.87559	-.35216	.89221	-.79480
LD	.40192	.32363	.32042	.56906	.78285	-.20059
LF	.71970	.78282	-.64701	.80619	-.25962	.62619
LH	-.23722	-.046437	-.36092	-.18295	-.44231	.12120
LJ	-.84370	-.82695	.59545	-.64480	.32366	-.61148
LL	-.75225	-.87061	.85461	-.84321	.41904	-.83386
LY	1.0000	.96373	-.56349	.86661	-.021898	.67506
LX	.96373	1.0000	-.72071	.88725	-.12939	.78788
LC	-.56349	-.72071	1.0000	-.51175	.68027	-.95666
LV	.86661	.88725	-.51175	1.0000	.0059586	.59806
LB	-.021898	-.12939	.68027	.0059586	1.0000	-.55289
LN	.67506	.78788	-.95666	.59806	-.55289	1.0000
LM	.97051	.98890	-.63681	.86825	-.0048310	.71126
LAA	.96735	.98370	-.65607	.83427	-.063079	.71065
LSS	.41726	.46631	-.13355	.43424	.54990	.16971
LDD	.73388	.79267	-.83865	.65299	-.61306	.86995
LFF	.79896	.66784	-.26791	.53447	.055084	.39399
LGG	.95921	.96352	-.59180	.85579	.0055362	.64724
LHH	-.79338	-.79327	.67653	-.79873	.45445	-.76943
LJJ	.94210	.97577	-.73144	.92395	-.22655	.80540
LKK	-.45327	-.58977	.48918	-.71772	.084160	-.40018
LLL	-.74140	-.86384	.85536	-.83718	.42122	-.83011
LYY	.94655	.98889	-.67627	.90717	-.072973	.72539
LXX	.44281	.57985	-.46045	.73120	-.083615	.37775
LCC	.63643	.46344	.15891	.62758	.42559	.063501
LVV	.67670	.71637	-.48454	.57198	-.094146	.39164
LQQ	-.78823	-.78611	.66711	-.79625	.45082	-.76213
LWW	.72384	.70440	-.59414	.44565	-.11878	.70356
LEE	-.72787	-.70739	.60726	-.40490	.11739	-.73593
LRR	-.64831	-.62402	.52824	-.35657	.069421	-.64093
LTT	-.19104	-.23484	-.012056	-.57713	-.079076	.032569
LZZ	.72253	.70425	-.58661	.44861	-.10115	.69632
LUU	-.50161	-.46997	.42573	-.20719	.016974	-.55219
LIII	.78476	.77583	-.63951	.52418	-.13009	.73883

```
               Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is LDS
 10 observations used for estimation from 2005 to 2014
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 CON                    71.1808           12.7277                5.5926[.001]
 LE                     -3.6214           .66634                 -5.4348[.001]
*******************************************************************************
 R-Squared                    .78688   R-Bar-Squared                .76024
 S.E. of Regression           .059636  F-stat.   F( 1,  8)  29.5372[.001]
 Mean of Dependent Variable   2.0081   S.D. of Dependent Variable   .12179
 Residual Sum of Squares      .028452  Equation Log-likelihood      15.1212
 Akaike Info. Criterion       13.1212  Schwarz Bayesian Criterion   12.8186
 DW-statistic                 2.4950
*******************************************************************************
```

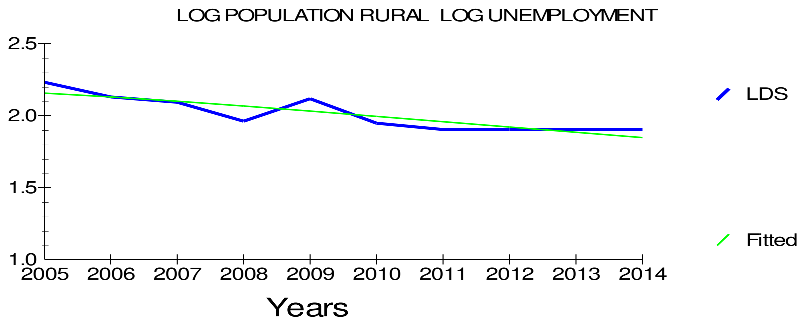
```
                          Diagnostic Tests
*******************************************************************************
*  Test Statistics  *     LM Version     *       F Version       *
*******************************************************************************
*                   *                    *                       *
* A:Serial Correlation*CHSQ(   1)=   1.3110[.252]*F(   1,   7)=   1.0562[.338]*
*                   *                    *                       *
* B:Functional Form   *CHSQ(   1)=   2.1136[.146]*F(   1,   7)=   1.8760[.213]*
*                   *                    *                       *
* C:Normality         *CHSQ(   2)=   .15823[.924]*      Not applicable       *
*                   *                    *                       *
* D:Heteroscedasticity*CHSQ(   1)=   .16863[.681]*F(   1,   8)=   .13722[.721]*
*******************************************************************************
  A:Lagrange multiplier test of residual serial correlation
  B:Ramsey's RESET test using the square of the fitted values
  C:Based on a test of skewness and kurtosis of residuals
  D:Based on the regression of squared residuals on squared fitted values
```




```
                Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is LDS
 10 observations used for estimation from 2005 to 2014
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 CON                    -69.1868          14.4548                -4.7864[.001]
 LR                     4.1257            .83764                 4.9254[.001]
*******************************************************************************
 R-Squared                    .75201   R-Bar-Squared                .72101
 S.E. of Regression           .064330  F-stat.   F( 1,  8)  24.2592[.001]
 Mean of Dependent Variable   2.0081   S.D. of Dependent Variable   .12179
 Residual Sum of Squares      .033107  Equation Log-likelihood      14.3636
```

Akaike Info. Criterion 12.3636 Schwarz Bayesian Criterion 12.0610
DW-statistic 2.2349
****

Diagnostic Tests
****
* Test Statistics * LM Version * F Version *
****
* * * *
* A:Serial Correlation*CHSQ(1)= .71324[.398]*F(1, 7)= .53762[.487]*
* * * *
* B:Functional Form *CHSQ(1)= 2.9815[.084]*F(1, 7)= 2.9737[.128]*
* * * *
* C:Normality *CHSQ(2)= .35308[.838]* Not applicable *
* * * *
* D:Heteroscedasticity*CHSQ(1)= .58086[.446]*F(1, 8)= .49335[.502]*
****
A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values



Ordinary Least Squares Estimation
****
Dependent variable is LE
10 observations used for estimation from 2005 to 2014
****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
CON	39.1447	.57681	67.8638[.000]
LR	-1.1615	.033426	-34.7491[.000]

****
R-Squared .99342 R-Bar-Squared .99260
S.E. of Regression .0025671 F-stat. F(1, 8) 1207.5[.000]
Mean of Dependent Variable 19.1010 S.D. of Dependent Variable .029833
Residual Sum of Squares .5272E-4 Equation Log-likelihood 46.5762
Akaike Info. Criterion 44.5762 Schwarz Bayesian Criterion 44.2736
DW-statistic .56090
****

Diagnostic Tests
****
* Test Statistics * LM Version * F Version *
****
* * * *
* A:Serial Correlation*CHSQ(1)= 2.2332[.135]*F(1, 7)= 2.0128[.199]*
* * * *
* B:Functional Form *CHSQ(1)= *NONE* *F(1, 7)= *NONE* *
* * * *
* C:Normality *CHSQ(2)= 1.2046[.548]* Not applicable *
* * * *
* D:Heteroscedasticity*CHSQ(1)= 1.8279[.176]*F(1, 8)= 1.7895[.218]*

****

A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values

Ordinary Least Squares Estimation

****

Dependent variable is LT
10 observations used for estimation from 2005 to 2014

****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
CON	2.0827	.79953	2.6049[.031]
LDS	-.051728	.39750	-.13013[.900]

****

R-Squared .0021124 R-Bar-Squared -.12262
S.E. of Regression .14524 F-stat. F(1, 8) .016935[.900]
Mean of Dependent Variable 1.9788 S.D. of Dependent Variable .13708
Residual Sum of Squares .16875 Equation Log-likelihood 6.2202
Akaike Info. Criterion 4.2202 Schwarz Bayesian Criterion 3.9176
DW-statistic 1.8226

****

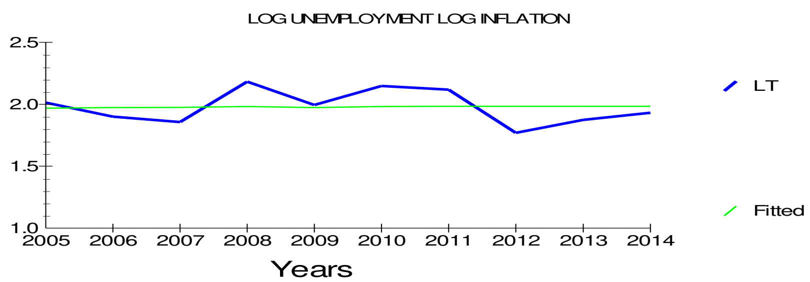
Diagnostic Tests

****

Test Statistics	LM Version	F Version
A:Serial Correlation	CHSQ(1)= .058066[.810]	F(1, 7)= .040883[.846]
B:Functional Form	CHSQ(1)= .064157[.800]	F(1, 7)= .045200[.838]
C:Normality	CHSQ(2)= .57782[.749]	Not applicable
D:Heteroscedasticity	CHSQ(1)= 2.9646[.085]	F(1, 8)= 3.3710[.104]

****

A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values



Ordinary Least Squares Estimation

****

Dependent variable is LDS
10 observations used for estimation from 2005 to 2014

****

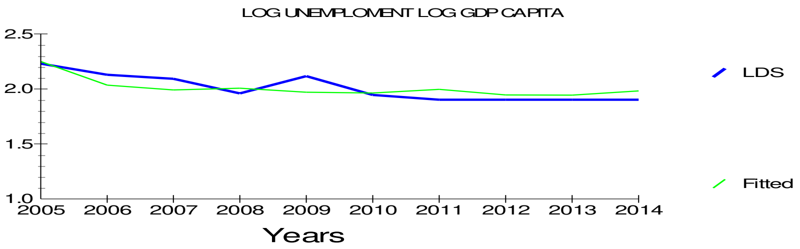
Regressor	Coefficient	Standard Error	T-Ratio[Prob]
CON	1.6228	.13020	12.4640[.000]
LOO	.15599	.051492	3.0293[.016]

****

R-Squared .53426 R-Bar-Squared .47604
S.E. of Regression .088160 F-stat. F(1, 8) 9.1770[.016]
Mean of Dependent Variable 2.0081 S.D. of Dependent Variable .12179
Residual Sum of Squares .062177 Equation Log-likelihood 11.2124

Akaike Info. Criterion 9.2124 Schwarz Bayesian Criterion 8.9098
DW-statistic 1.7381
****

Diagnostic Tests
****
* Test Statistics * LM Version * F Version *
****
* * * *
* A:Serial Correlation*CHSQ(1)= .065934[.797]*F(1, 7)= .046460[.835]*
* * * *
* B:Functional Form *CHSQ(1)= .60020[.439]*F(1, 7)= .44697[.525]*
* * * *
* C:Normality *CHSQ(2)= 1.2074[.547]* Not applicable *
* * * *
* D:Heteroscedasticity*CHSQ(1)= .53728[.464]*F(1, 8)= .45423[.519]*
****
A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values

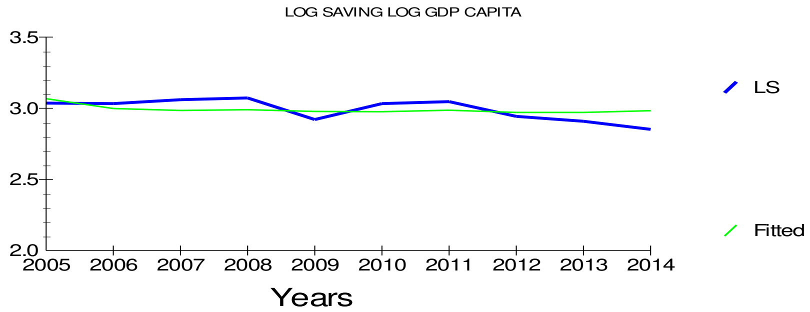


Ordinary Least Squares Estimation
****
Dependent variable is LS
10 observations used for estimation from 2005 to 2014
****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
CON	2.8690	.11238	25.5304[.000]
LOO	.049339	.044443	1.1102[.299]

****
R-Squared .13350 R-Bar-Squared .025184
S.E. of Regression .076090 F-stat. F(1, 8) 1.2325[.299]
Mean of Dependent Variable 2.9908 S.D. of Dependent Variable .077067
Residual Sum of Squares .046318 Equation Log-likelihood 12.6847
Akaike Info. Criterion 10.6847 Schwarz Bayesian Criterion 10.3821
DW-statistic 1.1361
****

Diagnostic Tests
****
* Test Statistics * LM Version * F Version *
****
* * * *
* A:Serial Correlation*CHSQ(1)= .95120[.329]*F(1, 7)= .73583[.419]*
* * * *
* B:Functional Form *CHSQ(1)= 2.3948[.122]*F(1, 7)= 2.2043[.181]*
* * * *
* C:Normality *CHSQ(2)= .71453[.700]* Not applicable *
* * * *
* D:Heteroscedasticity*CHSQ(1)= .54254[.461]*F(1, 8)= .45893[.517]*
****
A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values

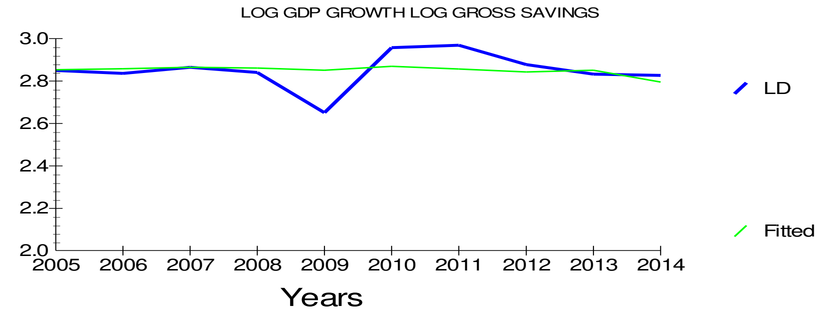


Ordinary Least Squares Estimation

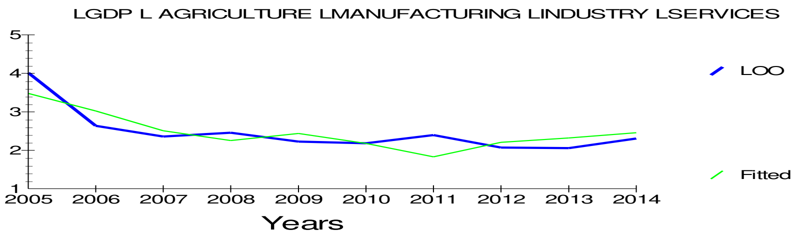
```
*******************************************************************************
 Dependent variable is LD
 10 observations used for estimation from 2005 to 2014
*******************************************************************************
 Regressor           Coefficient       Standard Error       T-Ratio[Prob]
 CON                  2.8316            .038515            73.5208[.000]
 LU                  .018431            .026438             .69713[.505]
*******************************************************************************
 R-Squared                .057269   R-Bar-Squared              -.060572
 S.E. of Regression        .089054   F-stat.    F(  1,   8)    .48599[.505]
 Mean of Dependent Variable    2.8500   S.D. of Dependent Variable     .086474
 Residual Sum of Squares       .063446   Equation Log-likelihood        11.1114
 Akaike Info. Criterion        9.1114   Schwarz Bayesian Criterion      8.8088
 DW-statistic                2.0067
*******************************************************************************
```

Diagnostic Tests

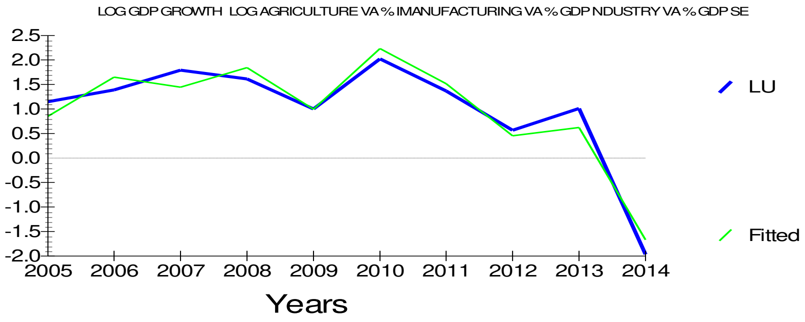
```
*******************************************************************************
*    Test Statistics  *        LM Version          *        F Version         *
*******************************************************************************
*                     *                            *                          *
* A:Serial Correlation*CHSQ(   1)= .0013432[.971]*F(   1,   7)= .9404E-3[.976]*
*                     *                            *                          *
* B:Functional Form   *CHSQ(   1)=   1.5309[.216]*F(   1,   7)=   1.2653[.298]*
*                     *                            *                          *
* C:Normality         *CHSQ(   2)=   3.1559[.206]*       Not applicable       *
*                     *                            *                          *
* D:Heteroscedasticity*CHSQ(   1)=  .059351[.808]*F(   1,   8)=  .047764[.832]*
*******************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values
```




```
                     Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is LOO
 10 observations used for estimation from 2005 to 2014
*******************************************************************************
 Regressor           Coefficient      Standard Error       T-Ratio[Prob]
 CON                  22.3595          10.5285              2.1237[.087]
 LF                   .0033097         .035578              .093026[.929]
 LJ                  -.016056          .044502             -.36078[.733]
 LY                   -2.4722          1.2849              -1.9240[.112]
 LV                   .049933          .057962              .86147[.428]
*******************************************************************************
 R-Squared                  .66628   R-Bar-Squared              .39930
 S.E. of Regression         .44232   F-stat.    F( 4,  5)   2.4956[.172]
 Mean of Dependent Variable   2.4699   S.D. of Dependent Variable     .57070
 Residual Sum of Squares      .97824   Equation Log-likelihood       -2.5665
 Akaike Info. Criterion      -7.5665   Schwarz Bayesian Criterion    -8.3229
 DW-statistic               2.1361
*******************************************************************************


                          Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version        *         F Version         *
*******************************************************************************
*                     *                          *                           *
* A:Serial Correlation*CHSQ(   1)=   .58369[.445]*F(   1,   4)=   .24795[.645]*
*                     *                          *                           *
* B:Functional Form   *CHSQ(   1)=   8.7155[.003]*F(   1,   4)=  27.1396[.006]*
*                     *                          *                           *
* C:Normality         *CHSQ(   2)=   1.3046[.521]*       Not applicable      *
*                     *                          *                           *
* D:Heteroscedasticity*CHSQ(   1)=   1.4269[.232]*F(   1,   8)=   1.3315[.282]*
*******************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values
```




```
                 Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is LU
 10 observations used for estimation from 2005 to 2014
*******************************************************************************
 Regressor          Coefficient       Standard Error        T-Ratio[Prob]
 CON                  -42.8751          10.3036              -4.1612[.009]
 LG                    .68832           .14198               4.8480[.005]
 LK                    .43589           .27221               1.6013[.170]
 LC                   13.1621           3.2051               4.1066[.009]
 LB                   -.43892           .39914              -1.0997[.322]
*******************************************************************************
 R-Squared                  .94321   R-Bar-Squared                 .89779
 S.E. of Regression          .35897   F-stat.    F( 4,   5)   20.7625[.003]
 Mean of Dependent Variable   .99380   S.D. of Dependent Variable    1.1228
 Residual Sum of Squares      .64431   Equation Log-likelihood      -.47856
 Akaike Info. Criterion      -5.4786   Schwarz Bayesian Criterion   -6.2350
 DW-statistic                2.6838
*******************************************************************************


                       Diagnostic Tests
*******************************************************************************
*    Test Statistics  *       LM Version        *        F Version          *
*******************************************************************************
*                    *                         *                           *
* A:Serial Correlation*CHSQ(   1)=   3.2549[.071]*F(   1,   4)=   1.9303[.237]*
*                    *                         *                           *
* B:Functional Form   *CHSQ(   1)=   8.8323[.003]*F(   1,   4)=  30.2558[.005]*
*                    *                         *                           *
* C:Normality         *CHSQ(   2)=   1.1550[.561]*       Not applicable       *
*                    *                         *                           *
* D:Heteroscedasticity*CHSQ(   1)=   .11965[.729]*F(   1,   8)=  .096875[.764]*
*******************************************************************************
  A:Lagrange multiplier test of residual serial correlation
  B:Ramsey's RESET test using the square of the fitted values
  C:Based on a test of skewness and kurtosis of residuals
  D:Based on the regression of squared residuals on squared fitted values
```



Ordinary Least Squares Estimation

```
*******************************************************************************
Dependent variable is LM
10 observations used for estimation from 2005 to 2014
*******************************************************************************
Regressor          Coefficient      Standard Error      T-Ratio[Prob]
CON                 1.5061            .13523           11.1370[.000]
LAA                 .65221            .023911          27.2766[.000]
*******************************************************************************
R-Squared                .98936   R-Bar-Squared              .98803
S.E. of Regression        .030403   F-stat.   F( 1,  8)  744.0142[.000]
Mean of Dependent Variable    5.1853   S.D. of Dependent Variable      .27791
Residual Sum of Squares     .0073945   Equation Log-likelihood       21.8586
Akaike Info. Criterion       19.8586   Schwarz Bayesian Criterion     19.5560
DW-statistic              2.3453
*******************************************************************************
```

Diagnostic Tests

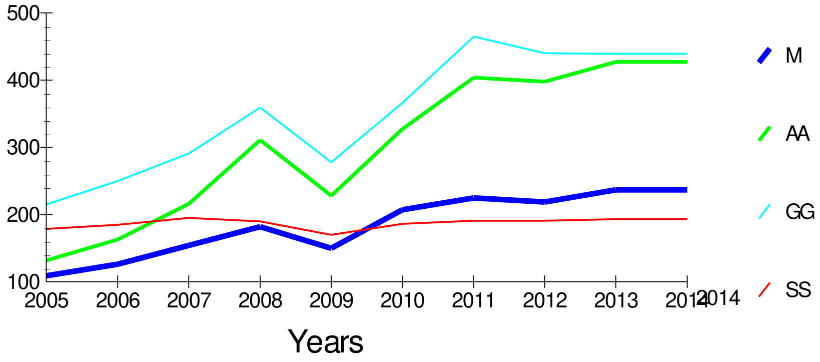
```
*******************************************************************************
*   Test Statistics  *       LM Version        *        F Version         *
*******************************************************************************
*                    *                         *                          *
* A:Serial Correlation*CHSQ(   1)=   .34642[.556]*F(   1,   7)=   .25120[.632]*
*                    *                         *                          *
* B:Functional Form   *CHSQ(   1)=   .17402[.677]*F(   1,   7)=   .12397[.735]*
*                    *                         *                          *
* C:Normality         *CHSQ(   2)=   .14491[.930]*      Not applicable        *
*                    *                         *                          *
* D:Heteroscedasticity*CHSQ(   1)=  .084334[.772]*F(   1,   8)=  .068041[.801]*
*******************************************************************************
  A:Lagrange multiplier test of residual serial correlation
  B:Ramsey's RESET test using the square of the fitted values
  C:Based on a test of skewness and kurtosis of residuals
  D:Based on the regression of squared residuals on squared fitted values
```

Ordinary Least Squares Estimation

```
*******************************************************************************
 Dependent variable is LGG
 10 observations used for estimation from 2005 to 2014
*******************************************************************************
 Regressor            Coefficient       Standard Error       T-Ratio[Prob]
 CON                 -15.2561           9.3714            -1.6279[.142]
 LSS                  4.0317            1.7911             2.2509[.054]
*******************************************************************************
 R-Squared                  .38776   R-Bar-Squared                .31122
 S.E. of Regression         .22679   F-stat.   F( 1,  8)    5.0667[.054]
 Mean of Dependent Variable   5.8377   S.D. of Dependent Variable     .27327
 Residual Sum of Squares      .41148   Equation Log-likelihood        1.7635
 Akaike Info. Criterion      -.23649   Schwarz Bayesian Criterion    -.53907
 DW-statistic                .41412
*******************************************************************************
```

Diagnostic Tests

```
*******************************************************************************
*   Test Statistics  *        LM Version        *         F Version          *
*******************************************************************************
*                    *                          *                            *
* A:Serial Correlation*CHSQ(   1)=   4.7427[.029]*F(   1,   7)=   6.3147[.040]*
*                    *                          *                            *
* B:Functional Form   *CHSQ(   1)=   .71836[.397]*F(   1,   7)=   .54177[.486]*
*                    *                          *                            *
* C:Normality         *CHSQ(   2)=   1.3972[.497]*     Not applicable        *
*                    *                          *                            *
* D:Heteroscedasticity*CHSQ(   1)=  .020152[.887]*F(   1,   8)=  .016154[.902]*
*******************************************************************************
  A:Lagrange multiplier test of residual serial correlation
  B:Ramsey's RESET test using the square of the fitted values
  C:Based on a test of skewness and kurtosis of residuals
  D:Based on the regression of squared residuals on squared fitted values
```

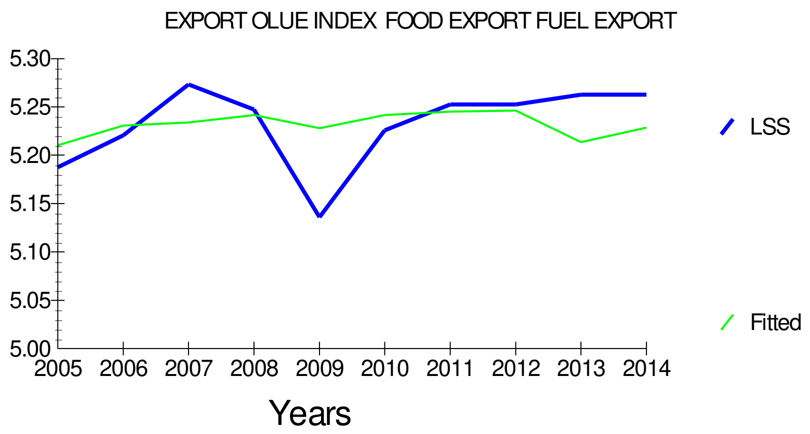


Ordinary Least Squares Estimation

```
*******************************************************************************
 Dependent variable is LSS
 10 observations used for estimation from 2005 to 2014
*******************************************************************************
 Regressor            Coefficient       Standard Error       T-Ratio[Prob]
 CON                   5.2265            .40386            12.9413[.000]
 LDD                 -.046533            .13293            -.35006[.737]
 LFF                  .075492            .091897            .82149[.438]
*******************************************************************************
 R-Squared                 .087991   R-Bar-Squared               -.17258
 S.E. of Regression        .045703   F-stat.   F( 2,  7)    .33768[.724]
```

Mean of Dependent Variable 5.2319 S.D. of Dependent Variable .042206
Residual Sum of Squares .014622 Equation Log-likelihood 18.4498
Akaike Info. Criterion 15.4498 Schwarz Bayesian Criterion 14.9959
DW-statistic 1.4847
****

Diagnostic Tests
****
* Test Statistics * LM Version * F Version *
****
* * * *
* A:Serial Correlation*CHSQ(1)= .47769[.489]*F(1, 6)= .30099[.603]*
* * * *
* B:Functional Form *CHSQ(1)= .20089[.654]*F(1, 6)= .12300[.738]*
* * * *
* C:Normality *CHSQ(2)= 2.0838[.353]* Not applicable *
* * * *
* D:Heteroscedasticity*CHSQ(1)= .89549[.344]*F(1, 8)= .78685[.401]*
****
A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values



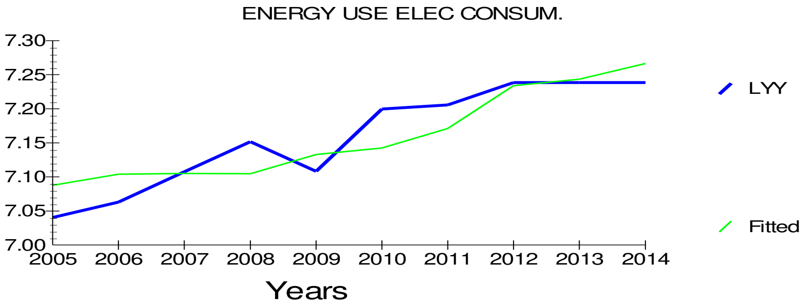
Ordinary Least Squares Estimation
****
Dependent variable is LYY
10 observations used for estimation from 2005 to 2014
****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
CON	8.1364	.19110	42.5753[.000]
LLL	-.99852	.19487	-5.1240[.001]

****
R-Squared .76646 R-Bar-Squared .73726
S.E. of Regression .038707 F-stat. F(1, 8) 26.2550[.001]
Mean of Dependent Variable 7.1592 S.D. of Dependent Variable .075514
Residual Sum of Squares .011986 Equation Log-likelihood 19.4437
Akaike Info. Criterion 17.4437 Schwarz Bayesian Criterion 17.1411
DW-statistic 1.4764
****

Diagnostic Tests
****
* Test Statistics * LM Version * F Version *
****
* * * *

```
* A:Serial Correlation*CHSQ(   1)=   .22505[.635]*F(   1,   7)=   .16116[.700]*
*                    *                       *                        *
* B:Functional Form   *CHSQ(   1)=   3.8831[.049]*F(   1,   7)=   4.4437[.073]*
*                    *                       *                        *
* C:Normality        *CHSQ(   2)=   .75969[.684]*       Not applicable       *
*                    *                       *                        *
* D:Heteroscedasticity*CHSQ(   1)=   2.6024[.107]*F(   1,   8)=   2.8144[.132]*
*******************************************************************************
  A:Lagrange multiplier test of residual serial correlation
  B:Ramsey's RESET test using the square of the fitted values
  C:Based on a test of skewness and kurtosis of residuals
  D:Based on the regression of squared residuals on squared fitted values
```




```
                 Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is LLL
 10 observations used for estimation from 2005 to 2014
*******************************************************************************
 Regressor              Coefficient       Standard Error         T-Ratio[Prob]
 CON                       .82251            .086960               9.4584[.000]
 LOO                      .063222            .034391               1.8383[.103]
*******************************************************************************
 R-Squared                     .29697   R-Bar-Squared                    .20910
 S.E. of Regression           .058882   F-stat.    F(  1,   8)    3.3794[.103]
 Mean of Dependent Variable    .97866   S.D. of Dependent Variable     .066209
 Residual Sum of Squares      .027736   Equation Log-likelihood        15.2486
 Akaike Info. Criterion       13.2486   Schwarz Bayesian Criterion     12.9460
 DW-statistic                  .38667
*******************************************************************************


                      Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version        *         F Version          *
*******************************************************************************
*                    *                       *                        *
* A:Serial Correlation*CHSQ(   1)=   6.2303[.013]*F(   1,   7)=  11.5692[.011]*
*                    *                       *                        *
* B:Functional Form   *CHSQ(   1)=   2.9473[.086]*F(   1,   7)=   2.9253[.131]*
*                    *                       *                        *
* C:Normality        *CHSQ(   2)=   .92603[.629]*       Not applicable       *
*                    *                       *                        *
* D:Heteroscedasticity*CHSQ(   1)=   .79761[.372]*F(   1,   8)=   .69339[.429]*
*******************************************************************************
  A:Lagrange multiplier test of residual serial correlation
  B:Ramsey's RESET test using the square of the fitted values
  C:Based on a test of skewness and kurtosis of residuals
  D:Based on the regression of squared residuals on squared fitted values
```

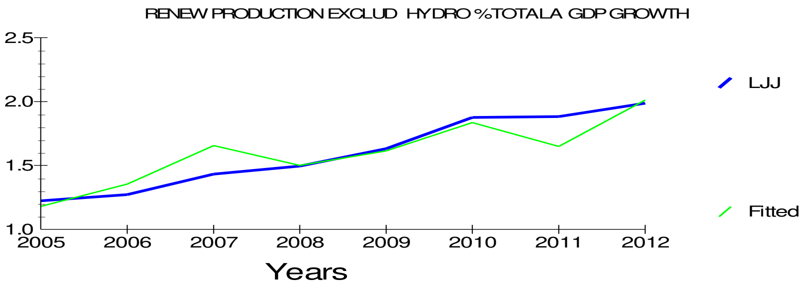
```
              Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is LLL
 8 observations used for estimation from 2005 to 2012
*******************************************************************************
 Regressor           Coefficient       Standard Error         T-Ratio[Prob]
 CON                  .89043            .067944             13.1054[.000]
 LOO                  .044131           .026055              1.6937[.141]
*******************************************************************************
 R-Squared                 .32347   R-Bar-Squared                .21071
 S.E. of Regression         .042735   F-stat.    F(  1,   6)    2.8688[.141]
 Mean of Dependent Variable    1.0026   S.D. of Dependent Variable     .048103
 Residual Sum of Squares      .010958   Equation Log-likelihood        15.0211
 Akaike Info. Criterion       13.0211   Schwarz Bayesian Criterion     12.9417
 DW-statistic                 .57636
*******************************************************************************


                    Diagnostic Tests
*******************************************************************************
*    Test Statistics  *       LM Version        *         F Version         *
*******************************************************************************
*                    *                          *                           *
* A:Serial Correlation*CHSQ(   1)=   3.8300[.050]*F(   1,   5)=   4.5923[.085]*
*                    *                          *                           *
* B:Functional Form   *CHSQ(   1)=   3.6144[.057]*F(   1,   5)=   4.1208[.098]*
*                    *                          *                           *
* C:Normality         *CHSQ(   2)=   1.1957[.550]*       Not applicable       *
*                    *                          *                           *
* D:Heteroscedasticity*CHSQ(   1)=   .95163[.329]*F(   1,   6)=   .81008[.403]*
*                    *                          *                           *
* E:Predictive Failure*CHSQ(   2)=   9.1872[.010]*F(   2,   6)=   4.5936[.062]*
*******************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values
   E:A test of adequacy of predictions (Chow's second test)
```

```
              Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is LLL
 8 observations used for estimation from 2005 to 2012
*******************************************************************************
 Regressor           Coefficient       Standard Error         T-Ratio[Prob]
 CON                    .94239            .023800            39.5965[.000]
 LHH                  .0044579           .0015288             2.9159[.027]
*******************************************************************************
 R-Squared                    .58627   R-Bar-Squared                   .51732
 S.E. of Regression          .033419   F-stat.    F(  1,   6)    8.5023[.027]
 Mean of Dependent Variable   1.0026   S.D. of Dependent Variable     .048103
 Residual Sum of Squares    .0067011   Equation Log-likelihood        16.9882
 Akaike Info. Criterion      14.9882   Schwarz Bayesian Criterion     14.9087
 DW-statistic                 1.0635
*******************************************************************************


                        Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version          *         F Version         *
*******************************************************************************
*                     *                            *                           *
* A:Serial Correlation*CHSQ(   1)=   .62519[.429]*F(   1,   5)=   .42387[.544]*
*                     *                            *                           *
* B:Functional Form   *CHSQ(   1)=   2.0207[.155]*F(   1,   5)=   1.6898[.250]*
*                     *                            *                           *
* C:Normality         *CHSQ(   2)=   1.6127[.446]*       Not applicable        *
*                     *                            *                           *
* D:Heteroscedasticity*CHSQ(   1)=   2.4700[.116]*F(   1,   6)=   2.6799[.153]*
*                     *                            *                           *
* E:Predictive Failure*CHSQ(   2)=   9.2267[.010]*F(   2,   6)=   4.6134[.061]*
*******************************************************************************
   A:Lagrange multiplier test of residual serial correlation
   B:Ramsey's RESET test using the square of the fitted values
   C:Based on a test of skewness and kurtosis of residuals
   D:Based on the regression of squared residuals on squared fitted values
   E:A test of adequacy of predictions (Chow's second test)



              Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is LLL
 8 observations used for estimation from 2005 to 2012
*******************************************************************************
 Regressor           Coefficient       Standard Error         T-Ratio[Prob]
 CON                   -2.8418             1.5216            -1.8677[.111]
 LKK                    1.0006             .39602             2.5267[.045]
*******************************************************************************
 R-Squared                    .51552   R-Bar-Squared                   .43477
 S.E. of Regression          .036164   F-stat.    F(  1,   6)    6.3843[.045]
 Mean of Dependent Variable   1.0026   S.D. of Dependent Variable     .048103
 Residual Sum of Squares    .0078472   Equation Log-likelihood        16.3567
 Akaike Info. Criterion      14.3567   Schwarz Bayesian Criterion     14.2772
 DW-statistic                 .89799
*******************************************************************************


                        Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version          *         F Version         *
*******************************************************************************
*                     *                            *                           *
* A:Serial Correlation*CHSQ(   1)=   .97050[.325]*F(   1,   5)=   .69030[.444]*
*                     *                            *                           *
* B:Functional Form   *CHSQ(   1)=   5.0112[.025]*F(   1,   5)=   8.3834[.034]*
*                     *                            *                           *
* C:Normality         *CHSQ(   2)=   .28983[.865]*       Not applicable        *
*                     *                            *                           *
```

```
* D:Heteroscedasticity*CHSQ(   1)=   .34267[.558]*F(   1,   6)=   .26851[.623]*
*                    *                    *                    *
* E:Predictive Failure*CHSQ(   2)=   1.2911[.524]*F(   2,   6)=   .64554[.557]*
*******************************************************************************
  A:Lagrange multiplier test of residual serial correlation
  B:Ramsey's RESET test using the square of the fitted values
  C:Based on a test of skewness and kurtosis of residuals
  D:Based on the regression of squared residuals on squared fitted values
  E:A test of adequacy of predictions (Chow's second test)
```

```
                Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is LJJ
 8 observations used for estimation from 2005 to 2012
*******************************************************************************
 Regressor             Coefficient       Standard Error        T-Ratio[Prob]
 CON                     9.2684              1.5395              6.0204[.001]
 LP                     -2.0150              .40432             -4.9835[.002]
*******************************************************************************
 R-Squared                    .80542   R-Bar-Squared                   .77299
 S.E. of Regression           .13883   F-stat.    F(  1,   6)   24.8357[.002]
 Mean of Dependent Variable   1.6001   S.D. of Dependent Variable      .29138
 Residual Sum of Squares      .11564   Equation Log-likelihood         5.5953
 Akaike Info. Criterion       3.5953   Schwarz Bayesian Criterion      3.5159
 DW-statistic                 1.6380
*******************************************************************************
```

```
                      Diagnostic Tests
*******************************************************************************
*    Test Statistics  *        LM Version        *         F Version          *
*******************************************************************************
*                    *                    *                    *
* A:Serial Correlation*CHSQ(   1)=   .29660[.586]*F(   1,   5)=   .19251[.679]*
*                    *                    *                    *
* B:Functional Form   *CHSQ(   1)= .4274E-3[.984]*F(   1,   5)= .2671E-3[.988]*
*                    *                    *                    *
* C:Normality         *CHSQ(   2)=  .040503[.980]*       Not applicable       *
*                    *                    *                    *
* D:Heteroscedasticity*CHSQ(   1)=  .016297[.898]*F(   1,   6)=  .012247[.915]*
*                    *                    *                    *
* E:Predictive Failure*CHSQ(   2)=   6.0597[.048]*F(   2,   6)=   3.0298[.123]*
*******************************************************************************
  A:Lagrange multiplier test of residual serial correlation
  B:Ramsey's RESET test using the square of the fitted values
  C:Based on a test of skewness and kurtosis of residuals
  D:Based on the regression of squared residuals on squared fitted values
  E:A test of adequacy of predictions (Chow's second test)
```



Ordinary Least Squares Estimation
****
Dependent variable is LJJ
8 observations used for estimation from 2005 to 2012
****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
CON	-1.2866	.55132	-2.3336[.058]
LFF	1.3224	.25165	5.2551[.002]

****

R-Squared	.82151	R-Bar-Squared	.79177
S.E. of Regression	.13296	F-stat. F(1, 6)	27.6159[.002]
Mean of Dependent Variable	1.6001	S.D. of Dependent Variable	.29138
Residual Sum of Squares	.10608	Equation Log-likelihood	5.9406
Akaike Info. Criterion	3.9406	Schwarz Bayesian Criterion	3.8612
DW-statistic	1.4292		

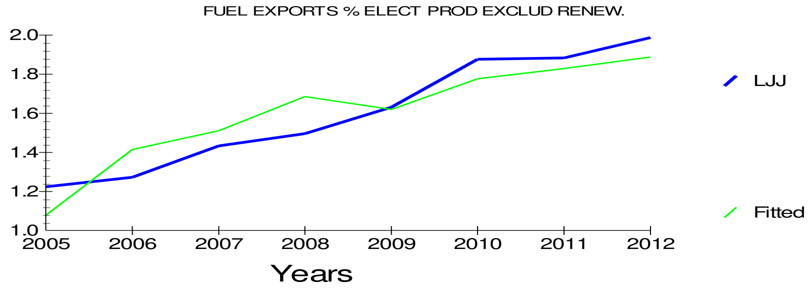
****

Diagnostic Tests
****

Test Statistics	LM Version	F Version
A:Serial Correlation	CHSQ(1)= .17652[.674]	F(1, 5)= .11281[.751]
B:Functional Form	CHSQ(1)= 5.0579[.025]	F(1, 5)= 8.5956[.033]
C:Normality	CHSQ(2)= .78912[.674]	Not applicable
D:Heteroscedasticity	CHSQ(1)= .81133[.368]	F(1, 6)= .67717[.442]
E:Predictive Failure	CHSQ(2)= 21.6137[.000]	F(2, 6)= 10.8069[.010]

****

A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values
E:A test of adequacy of predictions (Chow's second test)



Ordinary Least Squares Estimation
****
Dependent variable is LP
10 observations used for estimation from 2005 to 2014
****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
CON	38.6470	12.0671	3.2027[.013]
LXX	-2.2555	.77932	-2.8942[.020]

****

R-Squared	.51150	R-Bar-Squared	.45044
S.E. of Regression	.15805	F-stat. F(1, 8)	8.3767[.020]
Mean of Dependent Variable	3.7222	S.D. of Dependent Variable	.21319
Residual Sum of Squares	.19983	Equation Log-likelihood	5.3751
Akaike Info. Criterion	3.3751	Schwarz Bayesian Criterion	3.0725
DW-statistic	1.2348		

****

Diagnostic Tests
****

Test Statistics	LM Version	F Version
A:Serial Correlation	CHSQ(1)= .18403[.668]	F(1, 7)= .13123[.728]
B:Functional Form	CHSQ(1)= 4.9262[.026]	F(1, 7)= 6.7964[.035]
C:Normality	CHSQ(2)= .84786[.654]	Not applicable
D:Heteroscedasticity	CHSQ(1)= .18030[.671]	F(1, 8)= .14689[.712]

****

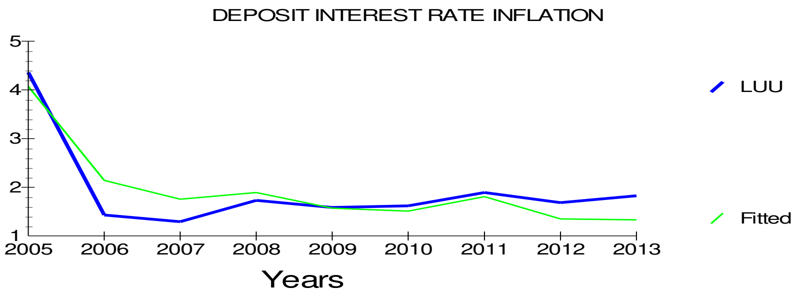
A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values

```
              Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is LU
 10 observations used for estimation from 2005 to 2014
*******************************************************************************
 Regressor           Coefficient      Standard Error       T-Ratio[Prob]
 CON                 156.3422          72.4665             2.1574[.063]
 LXX                 -10.0328           4.6801            -2.1437[.064]
*******************************************************************************
 R-Squared                 .36486   R-Bar-Squared                .28547
 S.E. of Regression          .94911   F-stat.    F(  1,   8)    4.5956[.064]
 Mean of Dependent Variable    .99380   S.D. of Dependent Variable      1.1228
 Residual Sum of Squares       7.2064   Equation Log-likelihood       -12.5513
 Akaike Info. Criterion      -14.5513   Schwarz Bayesian Criterion    -14.8539
 DW-statistic               1.9619
*******************************************************************************


                    Diagnostic Tests
*******************************************************************************
*    Test Statistics  *       LM Version       *        F Version        *
*******************************************************************************
*                  *                     *                      *
* A:Serial Correlation*CHSQ(   1)=   2.7630[.096]*F(   1,   7)=   2.6726[.146]*
*                  *                     *                      *
* B:Functional Form   *CHSQ(   1)=   3.3666[.067]*F(   1,   7)=   3.5527[.101]*
*                  *                     *                      *
* C:Normality        *CHSQ(   2)=   3.0567[.217]*       Not applicable       *
*                  *                     *                      *
* D:Heteroscedasticity*CHSQ(   1)=   .98052[.322]*F(   1,   8)=   .86969[.378]*
*******************************************************************************
  A:Lagrange multiplier test of residual serial correlation
  B:Ramsey's RESET test using the square of the fitted values
  C:Based on a test of skewness and kurtosis of residuals
  D:Based on the regression of squared residuals on squared fitted values
```

```
    Ordinary Least Squares Estimation
*******************************************************************************
 Dependent variable is LUU
 9 observations used for estimation from 2005 to 2013
*******************************************************************************
 Regressor           Coefficient      Standard Error       T-Ratio[Prob]
 CON                  -1.5478           .62171            -2.4896[.042]
 LOO                   1.4002           .24360             5.7479[.001]
*******************************************************************************
 R-Squared                 .82517   R-Bar-Squared                .80019
 S.E. of Regression          .41490   F-stat.    F(  1,   7)   33.0381[.001]
 Mean of Dependent Variable    1.9362   S.D. of Dependent Variable      .92818
 Residual Sum of Squares       1.2050   Equation Log-likelihood        -3.7220
 Akaike Info. Criterion       -5.7220   Schwarz Bayesian Criterion     -5.9192
 DW-statistic               1.0613
*******************************************************************************


                    Diagnostic Tests
*******************************************************************************
*    Test Statistics  *       LM Version       *        F Version        *
*******************************************************************************
*                  *                     *                      *
* A:Serial Correlation*CHSQ(   1)=   1.2916[.256]*F(   1,   6)=   1.0054[.355]*
*                  *                     *                      *
* B:Functional Form   *CHSQ(   1)=   7.1044[.008]*F(   1,   6)=  22.4866[.003]*
*                  *                     *                      *
* C:Normality        *CHSQ(   2)=   .73952[.691]*       Not applicable       *
*                  *                     *                      *
* D:Heteroscedasticity*CHSQ(   1)= .0052406[.942]*F(   1,   7)= .0040784[.951]*
*                  *                     *                      *
```

* E:Predictive Failure*CHSQ(1)=   .14315[.705]*F(1,   7)=   .14315[.716]*
****

A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values
C:Based on a test of skewness and kurtosis of residuals
D:Based on the regression of squared residuals on squared fitted values
E:A test of adequacy of predictions (Chow's second test)



Ordinary Least Squares Estimation
****

Dependent variable is LRR
9 observations used for estimation from 2005 to 2013
****

Regressor	Coefficient	Standard Error	T-Ratio[Prob]
CON	7.1073	6.9508	1.0225[.341]
LU	-1.7729	5.0052	-.35421[.734]

****

R-Squared	.017608	R-Bar-Squared	-.12273
S.E. of Regression	6.3542	F-stat. F(1, 7)	.12546[.734]
Mean of Dependent Variable	4.7624	S.D. of Dependent Variable	5.9968
Residual Sum of Squares	282.6277	Equation Log-likelihood	-28.2815
Akaike Info. Criterion	-30.2815	Schwarz Bayesian Criterion	-30.4787
DW-statistic	1.1061		

****

Diagnostic Tests
****

Test Statistics	LM Version	F Version
A:Serial Correlation	CHSQ(1)= .2127E-3[.988]	F(1, 6)= .1418E-3[.991]
B:Functional Form	CHSQ(1)= .65919[.417]	F(1, 6)= .47419[.517]
C:Normality	CHSQ(2)= 13.8842[.001]	Not applicable
D:Heteroscedasticity	CHSQ(1)= .25052[.617]	F(1, 7)= .20043[.668]
E:Predictive Failure	CHSQ(1)= .20204[.653]	F(1, 7)= .20204[.667]

****

A:Lagrange multiplier test of residual serial correlation
B:Ramsey's RESET test using the square of the fitted values

7. CONCLUSION

The richness of natural world ,number of species among plants and animals, as well as forest area – lung of the world-need to be considered not just in economic , political, legal matters but also in our daily life. Supporting thesis is the research and high alert news about growing number of extinct, endangered, critically endangered species that comes from South America (Brazil, Equador).

By comparing numbers in only ten years we can note that trend worsens for many mammals, birds, reptiles, amphibians, and fishes, and Brazil is among many regions in the world also faced with problem of protection its natural resources and families : we can find increasing number of extinct species in families of amphibians, insects, plants, Mollusca etc. From 5771 threatened species that inhabits South America 1016 are living in Brazil. (Plants 516, amphibians 86 etc.). And besides Equator, Brazil need special attention to keep valuable natural resources a home to endangered life. The same negative trend is present among plant families from endangered 8045 in South America 1209 of families are struggling for existence in Brazil.

A Brazil is also valued as the area of forest richness and great Amazon region. That is why the policy of preserving forest area, richness in varieties of life, is a matter not just for Brazilian Government, Legal obligation and Agricultural policy but also a one of the world issues. Forest area second to one in Russia was decreased yearly by worriesam trend,but that was lately showed strong signs of slow down. With low level of conservation policy, overcutting, due to river region and problems of afforestation possible flooding increased with global CO_2 growth is possible. This environmental dangers further reduce GDP growth, have further negative and social impact on local region, country and even if spread over borders influence bigger region. In that respect paper look at the preservation policy as the important part of country, region (flooding, trade input, possibly energy exchange) and world (right to existence, lungs of the world, tourist region, kept species, life that exist, bequest value). Brazil active policy in preserving natural resources can further contribute to economic sector as whole : increased number of tourist, more secure place, bigger manufacturing options, new ideas by protection all life forms and reducing extinction. Some examples: *tourist resorts, research centers, school camps, international places to meet, paying for existence having one animal /plant as protected species, exchange good/money / natural resource/knowledge through many research tourist centers in world.*

Further problems of preserving the forest can be if longer period of GDP growth decrease, social inequality rise, low level of international and domestic projects that involved all groups- especially women, low income, underprivileged exist. Paper suggest further energy diversification (working on quality - agricultural left overs, wind, solar –with innovative manufacturing cooperation) and reducing number of forest usage as energy input. Small scale project , loan and tax incentive as well as promoting social equality can bring boom to economy, increase afforestation , trade with other continents,BRIC , Africa, Europe and help all countries in South America region to further develop its natural , economic, political and industry potentials.

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