

## ***THE EFFECTS CAUSED BY THE RAIN FALLS REGISTRATED BETWEEN 2004 – 2007 PERIOD***

***Author: Iulian Mihnea, correspondent member of the Agricultural and Forestry Science Academy “Gh. Ionescu Sisesti” Bucharest, Romania***

In Romania were developed over 3 million ha of land for irrigation, over million ha of watering land, 2,5 million embankment land over 3000 km dikes, 2 million ha protected against flooding as well as numerous communication ways and other social-economic objectives protected by dikes or water discharge network.

In the last 20 years Romania was affected by years of dryness and water excess.

The water excess was felt by its effects of calamity and agricultural land, and also on the people living places or populated centers. The huge amount that came down between 2004 – 2008 rainfalls as well as the amount of water registered by the water courses issued enormous damages to the country economy is presented in figure 1 and 2.

Breaking the equilibrium by deforestation brought along with economical matters and losing a member of human and animals.

There are months in the rainy years or normal years with respect with the rain when a recorded 150 – 250 mm and years with dry months, or even normal or reduced amount of rain.

Big amount of precipitation could be recorded in short period of time, for example in 1-5 consecutive days when could be measured from 50 to 150 mm. Then, in those places the drainage of surface water or the infiltration in the deeper layer reduced and issue in that soil a process of pseudogleization or contribute to stored the vertical level.

Beginning with 2008 the recorded data allow excess water precipitation to be launched, a series of proposal and even projects for rehabilitation of the drainage works against floods and adapting forms advantageous project eliminating the humidity excess.

Roads and others objectives with economic and social character, protected by dikes water discharge network and pumping station will be recommended for rehabilitation.

Due to the huge deforestation which have broken the natural equilibrium a lot of economical goods and human and animal life have been destroyed.

There are months in raining years or in normal years when the rainfalls have registered 150-250 mm and years with dry months, normal or small quantity of rainfalls.

Then, in those places, the drainage surface water or the infiltration in deeper layers is reduced, the excess water precipitation could be stored and could issued, in soil a process of pseudogleization or could contribute to the underground water level rising.

The main categories of proposed projects that could be developed in regime of emergency are:

- rehabilitation of existing dikes or executing of new dikes on the location existing or even a new location;
- storages eventually rehabilitation of drainage work following the torrential precipitation, damaged;
- execution the drainage systems on both agricultural land and urban areas.

In completion of above underline the fact that in 2005 the total amount of precipitation was 1118l/mp comparing with average year being 550l/mp in Bucharest.

From 1881 to 2007 the number of the years with wet , normal and dry regime is presented in figure 3.

The damage registered could be evaluated using the presented data for 3 regions located on south of country: Teleorman, Olt and Arges.

- *Teleorman*: one dead, 68 living house holds, 31 social-economic objectives, 66 small bridges, 108 timber bridges, 31 socio economic, 6,35 km of national roads, 102 electrical lines distraint national;
- *Olt*: 6 dead persons, 42 small localities under water, 800 persons evacuated, 3250 flooded houses, 1300 grave affected and 60 completely deteriorated, 4800 farmers, 24 sources, 16 economic objectives, 8 dams;
- *Arges*: 11 house holds, 595 flooded farms, 122 water sources, 152 houses, 1871 ha f loaded agricultural lands, 19 km of regional and country roads, 13 bridges and timber bridges.

The damage registered in 1970, 2005 and 1975 year are:

- *1970*: 1058376 arable land flooded, 85453 houses, 2843 km routs and 3547 bridges;
- *2005*: 416995 arable land flooded, 60828 houses, 4667 routs and 3244 bridges;
- *1975*: 330644 arable land folded, 33784 houses, 1951 km routs and 79 bridges.

Agro climatic zone is presented in figure 4a and 4b.

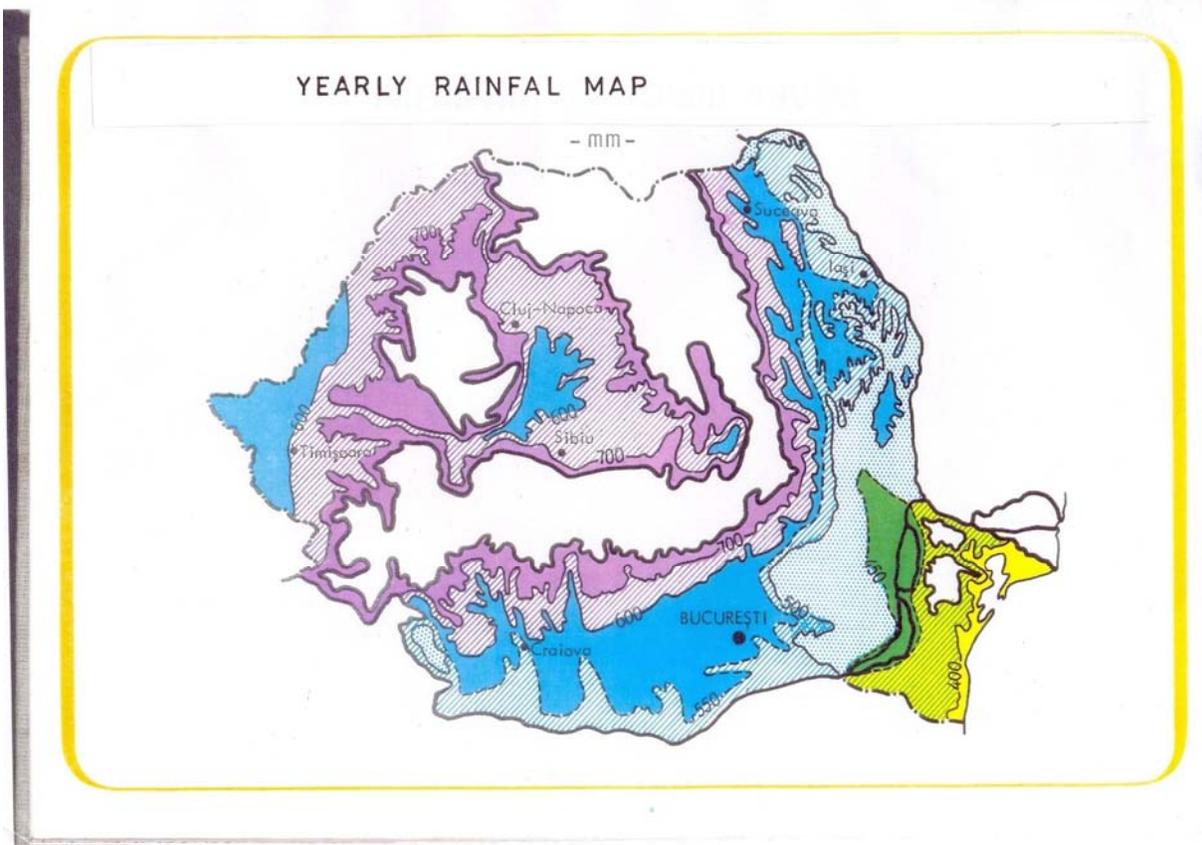


Fig. 1

# SOIL MAP ROMANIA

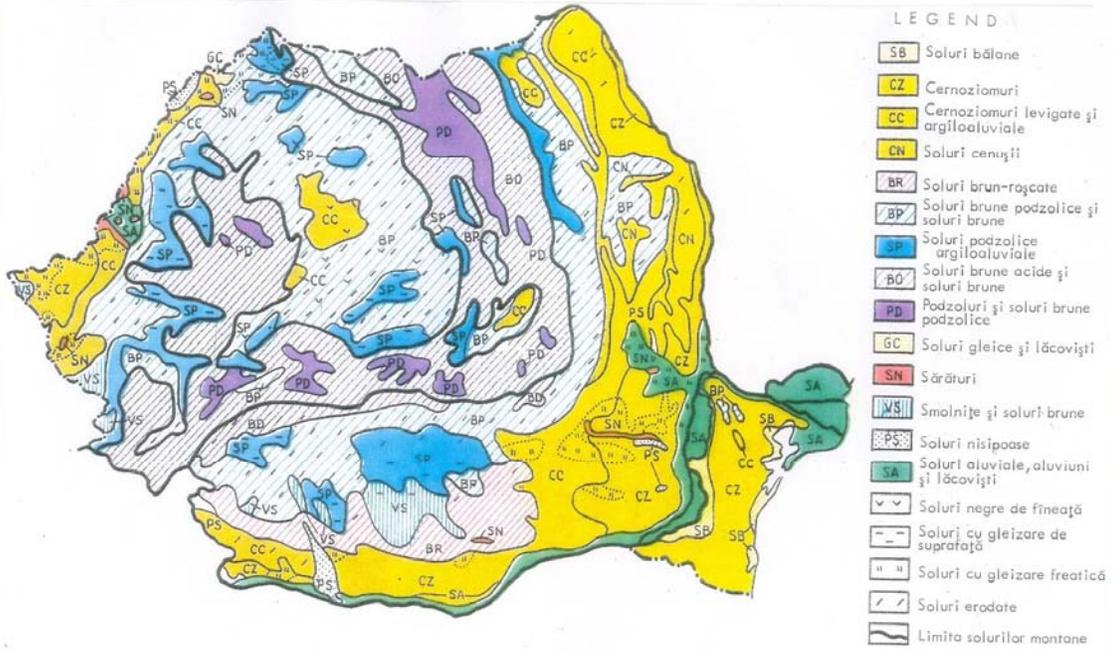


Fig. 2

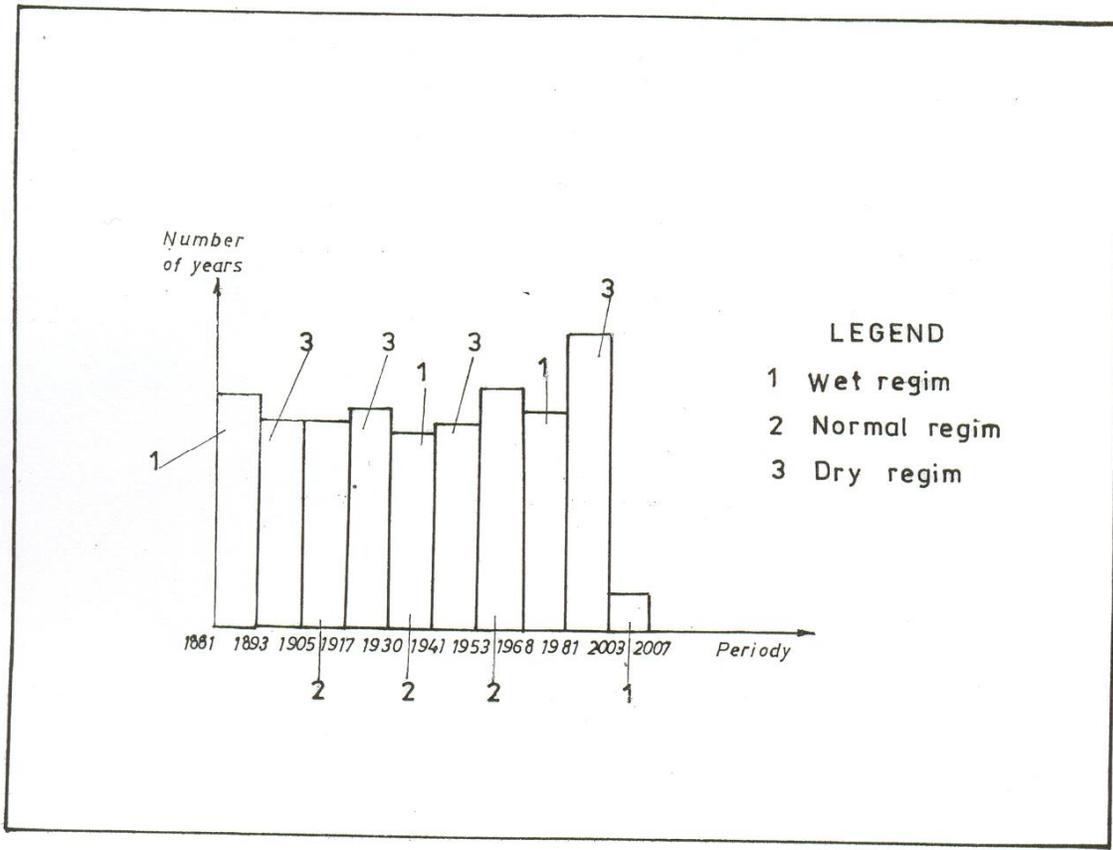


Fig. 3

# AGRO CLIMATIC ZONES

ZONA	CARACTERISTICI GENERALE	SUBZONE	$\Sigma T > 0^{\circ}\text{C}$ ANUAL	A. RESURSE TERMICE					
				$\Sigma T$ efective > $10^{\circ}\text{C}$	RADIATIA SOLARA KCAL./AN	DURATA DE STRĂLUCIRE A SOARELUI (ORE)	Temp. critice $\Sigma T$ max. > $32^{\circ}\text{C}$	Temperatura minimă absolută	Unități de ger $\Sigma T < -15^{\circ}\text{C}$
I.	CALDĂ SECE TOASĂ	1	4100-4200	1600	132-136	2350	10	-28, -33	1-3
		2	4200-4250	1600-1700	128-132	2275	10-20	-20, -22	4-6
		3	4200-4300	1700	124-127	2250	30-40	-29, -34	8-10
		4	4000-4300	1600-1700	125-128	2200	20-40	-30, -32	20-24
		5	4100-4250	1400-1500	125-128	2200	20-30	-29, -30	10-20
II.	MODERATĂ SUEUMEDĂ	1	3900-4100	1500-1600	125-128	2200	20-40	-29, -33	14-16
		2	3400-3600	1300-1400	116-120	2000	< 10	-30, -32	24-26
		3	3400-3700	1500-1600	122-126	2080	10-20	-26, -30	14-16
		4	3800-3950	1200-1400	118-122	2000	< 10	-30, -32	18-20
		5	3400-3550	1100-1300	114-118	1950	< 10	-30, -32	30-35
		6	3900-4100	1400-1500	118-122	2100	10-25	-30, -33	12-14
		7	3800-3900	1400-1500	116-128	2150	10-20	-30, -32	16-18
		8	3500-3600	1400-1500	117-120	2000	10-20	-29, -32	24-26
III.	RACOROSĂ UMEDĂ	1	3400-3500	1000-1200	113-117	1900-2000	< 10	-27, -31	22-24
		2	3000-3200	800-1000	112-116	1900-2000	< 10	-31, -33	29-30
		3	2900-3000	600-800	110-114	1800-1900	< 10	-30, -33	45-50

Fig. 4a

ZONA	CARACTERISTICI GENERALE	SUBZONE	B. RESURSE DE UMIDITATE					EPOCI OPTIME DE SEMANAT DATE MEDII		
			PRECIPITAȚII				Rezerve de umiditate în sol 0-100 cm în m <sup>3</sup> la ha 31. III	DEFICIT IV-X la 0-100 cm în l/m <sup>3</sup> la ha.	Sfârșit toamnă (Grâu)	Început primăvară (Porumb)
			Anual I-XII	XI-III	IV-X	VII				
I.	CALDĂ SECE TOASĂ	1	350-400	150-200	200	35-40	1133-1173	4417-4646	15-20.X	13-16.IV
		2	400-450	125-175	275	40-50	1137-1273	3857-4472	12-18.X	10-13.IV
		3	450-500	150-200	300	45-55	964-1510	2810-4176	15-20.X	9-12.IV
		4	500-550	170-220	330	50-60	1130-1370	3331-3824	10-15.X	10-13.IV
		5	550-600	150-200	150	65-75	1323-1414	3236-3424	10-15.X	10-13.IV
II.	MODERATĂ SUBUMEDĂ	1	600-650	170-220	430	55-65	1173-1445	3044-3915	10-15.X	13-16.IV
		2	550-600	120-170	430	60-70	1209-1292	3314-3612	1-5.X	17-20.IV
		3	600-700	200-300	400	70-80	1445-1611	2474-3010	5-10.X	17-20.IV
		4	450-500	125-175	325	50-60	1272-1287	3146-3523	1-5.X	21-24.IV
		5	500-550	100-150	400	55-60	1193-1440	2665-3627	1-5.X	21-24.IV
		6	675-735	200-260	475	65-75	1434-1675	2209-3190	10-15.X	11-14.IV
		7	600-650	200-250	400	65-75	1386-1712	2295-2995	5-10.X	12-15.IV
		8	575-625	125-175	450	70-80	1252-1445	2450-2902	5-10.X	17-20.IV
III.	RĂCCROASĂ UMEDĂ	1	640-680	140-180	500	95-105	1295-1817	2051-2432	1-5.X	21-24.IV
		2	680-720	120-160	560	115-125	1444-1761	1552-2394	25-30.X	25-29.IV
		3	650-750	160-200	380	95-105	1484-1875	1523-1617	25-30.X	25-29.IV

Fig. 4b