

Geomorphological investigation of the drainage network and calculation of the peak storm runoff (Qp) and sediment yield of Sarantapotamos and Katsimidi streams, Attica, Greece

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ABSTRACT: Drainage basins of Sarantapotamos and Katsimidi streams lie on western Attica (Greece) and their torrents cross the city of Elefsina. They belong geotectonically to the Sub Pelagonic zone and consist of Triassic - Jurassic carbonate rocks, interbedded schists and sandstones. This paper deals with the geomorphological and statistical study of the drainage systems, as well as the calculation of the peak storm runoff and sediment yield of all drainage basins in certain important places including the river exits. The statistical analysis showed that the drainage systems were influenced by lithology, as well as that the systems were in an advanced maturity stage of development. The peak storm runoff that was estimated, concerns the extreme values of the maximum probable peak storm runoff, with a 100 years recurrence period. The flood levels of the torrents and streams should be taken seriously into consideration in order to foresee and anticipate the necessary sewage and drainage work systems. The mean annual sediment yield of each one basin was also calculated and revealed that the draining capacity of the streams decreases with time, resulting in extensive floods after strong rainfalls in the wider area. Maintainance of the channels are finally suggested.

INTRODUCTION

The drainage basins of Sarantapotamos and Katsimidi streams lie in western Attica. They are surrounded by Pateras and Kitheronas mountains at west, Pastra mt at north and Parnitha mt in the northeast. The city of Elefsina lies on Thriasio Pedio (plain) downstream. It is one of the areas of Attica wwhich often suffers from storm floods. Sarantapotamos and Katsimidi torrents cross the city of Elefsina. The purpose of this paper is the geomorphological and statistical study as well as the calculation of the peak storm runoff and sediment yield of the above drainage systems in several places including the river mouths. Thus, the results of this study should be taken seriously into account for planning and constructing sewage and drainage work systems. The studied area belongs geotectonically to the Sub Pelagonic zone and of Triassic - Jurassic carbonate rocks, interbedded (malange) schists and sandstones (I.G.M.E. 1:50.000). The northeastern part of the drainage basin of Sarantapotamos consists of Upper Cretaceous limestones interbedded with marly limestones. In the mountainous part of this drainage basin from Panacto village up to Vilia there are extensive Late Paleozoic beds outcrops, consisting of alternating formations of volcanic tuffs, and shales. Almost the total area of Thriassio Pedio and the polje of Oinoi, consist of Quarternary deposits including alluvial and diluvial formations, consisting of red clays, conglomerates, alluvial fans, screes and talus cones which are loose or cohesive. The coastal areas of Thriasio Pedio consist of alluvial deposits and marly-sandy materials, covered by soil. Because of the action of alpine tectonism, the formations are strongly folded, while Late Paleozoic beds are overthrusted uppon limestones on the pediments of Pastra mountain.

DRAINAGE SYSTEMS

The channels of Sarantapotamos and its main streams have been developed on carbonate rocks. Drainage basins have a rough relief. They lie between mountain Pateras to the south and Kitheronas to the north. Altitudes are high (Pateras mt 1132 m, Pastra 1016 m), valleys are deep and the relief is variable. Karstification is extensive and in an advanced stage of development. Many, inner drainage basins and valleys were formed by karstification. The biggest Karst landform is the polje of Oinoi. The main axis of this plain is about 13Km long. The direction of the valleys is parallel to the axis of the alpine folds or the main tectonic lines and is affected by tectonism.

In the studied area three main fault systems can be distinguished. The faults of the first system are directed ENE-WSW and locally E-W. The second system includes faults directed NE-SW and the third one gives the most significant faults of NW-SE direction. The development of the big Neogene basins of Megara is due to these faults (Dounas, 1971).

Furthermore it must be mentioned that the studied area has been, affected by intensive karst erosion, because it was a land since Up.Cretaceous. The development of the main valleys and geomorphic processes has started after Alpine folding.

DRAINAGE NETWORK

A map of the drainage network at a scale of 1:50.000 was drawn in order to study the drainage network of Sarantapotamos and Katsimidi streams. This map includes the channels of the topographic map of HAGS completed by airphoto-interpretation and field



Fig. 1: Map of drainage network.

observations. Then the parameters of the drainage network were measured and calculated. All the data were classified in Tables1 and 2. The ordering of the streams was made according to A. STRAHLER'S system (1957). The drainage network is shown on the map of figure 1.

The drainage network of Sarantapotamos constitutes a 5th order drainage basin, which has an area of 256,364 Km². The western part of this drainage basin consists of two oblong 4rth order drainage basins which have a long, E-W axis, while the northwestern part consists of two smaller 4th order drainage basins.

We numbered fourteen 3rd order drainage basins. Some of them belong to 4rth order basins while others, such as 10 and 13, drain directly to 4rth and 5th order

TABLE I	Morphomel	ry of	the o	train	age s	system	S.		
Saranta	potamos								
Basin	N1	N2	N3	N4	N5	SN	L1,	L2,	L3,
							km	km	km
1 .	18	6	1			48	7,0	3,0	4,0
2	6	- 2	1			9	2,1	0,9	0,1
3	15	3	1			19	2,0	3,0	3,0
4	10	- 4	1			15	8,0	6,0	7,0
5	9	2	1			12	4,0	1,5	2,0
6	3	4	1			15	4,0	4,0	3,5
7	12	5	1			18	5,0	4,0	3,5
8	15	3	1			18	9,5	3,5	2,9
9	9	4	1			14	4,0	3,0	1,5
10	9	2	1			12	5,1	1,0	2,5
11	21	3	1			25	10,0	5,0	0,1
12	16	3	1			9	4,0	1,0	1,0
13	8	2	1			11	7,0	3,0	3,9
14	11	2	1		$\overline{}$	15	5,8		2,5
				Г	П				
A	96	23	5	1		136	39.1	7,1	7,1
8	59	21	5	1		76	33,5	19,0	19,
		_	L	<u></u>	1	_			_
С	_40	9	3	1		53	18,0		
D	32	9	3	1	_	45	18,3	5,1	6,
Sa	227	64	14	۱ 4	١,	310	116,9	54,1	30
Sa	221	04	'"	1 7	1'	310	110,9	34,1	٦٩
Katsimidi		-	_	_	_	_			_
1a	11	3	1	Т	Γ	15	4,00	4.0	2.
2a	12			_	_	16	5.00	1.8	5.
3a	23			1	$\overline{}$	30	9,00		2.
4a	7	2		-	-	10			0,
5a	12			-	\vdash	16			7,
									Г
Α,	23	6	2	1		32	10,20	8,8	7.
В'	37	11		1		52			
K	60	17			2 1	85	29,30		

streams. An asymmetrical development of the drainage network basin B is observed north of the 4rth order stream a lot of 3rd order basins are developed ,while south to it part there are no streams. It has to be mentioned that in the drainage basin A numerous 1st and 2nd order streams drain directly to a 4rth order stream. This fact is of particular interest, because during strong rainfalls these streams supply water directly to the main channel of the drainage basin. This causes a rapid increase of the water level and serious flood problems. The shape of the drainage network is rectangular, showing the influence of

	L4, km	L5, km	SL, km	Rb _{1/2}	Rb _{2/3}	Rb _y	Rbu	WRb
1			14,0	3,0	6,0			4,5
2			3,1	3,0	2,0			2,5
3		- 4.	8,0	5,0	3,0	100		4.0
4			21,0	2,5	4,0	200	T.,	3,3
5		161	7,5	4,5	2,0	Her	7.3	3,3
6		777	11,5	0,8	4,0			2,4
7			12,5	2,4	5,0			3,7
8			15,9	5,0	3,0			4,0
9		12	8,5	2,3	4,0	-6.	199	3,1
10_			8,6	4,5	2,0			3,3
11			15,1	7,0	3,0	1		5,0
12			6,0	5,3	3,0			4.2
13		9	13,9	4,0	2,0	C 11 3		3,0
14		_	10,4	5,5	2,0			3,8
A	12,0		65,3	4,2	7,7	3,0		3,0
В	13,0		84,5	2,8	4,2	5,0		1,7
C	1,0		32,1	4,4	3,0	3,0	1.52	2,
D	4,0		33,8	3,6	3,0	3,0	_	2,2
Sa		17,2	247,8	3,5	4,6	3,5	4,0	3,0
Katsim	nidi							
1a			10,0	3,7	3,0			3,3
2a			11,8	4,0	3,0	2	134.0	3,5
3a.	W-1		19,5		6,0	-	- 3	4,9
4a			4,1	3,5	2,0			2,8
5a			14,0	4,0	3,0			3,
A'	4,0		30,0	3,8	3,0	2,0		2,5
8,	5,0		46,1	3,4	3,7	3,0		2,9 3,
ĸ	9,0	5,0	81,1	3,5	3,4	2,5	2,0	2,

Saranta Basin	LI	_	Ľ		L	3-	П	.4	R	Lan	R	L _{3/2}	RI	4/3	RLs	WR	L-
						,											
1_	0	4	0	.5	_	4,0				1,3		8,0		0,0			4,6
2	.0	,4	0	,5	ď.	0,1				1,3		0,1		0,0			0,7
3	0	1	1	,0		3,0				7,5		3,0		0,0			5,3
4	0	8,	.1	,5		7,0				1,9		4,7		0,0			3,3
5	0	.4	0	8		2,0				1,7		2,7		0,0			2,2
6	1	,3	4	,0		3,5	L		,	0,8		3,5		0,0			2,1
. 7	0	4	0	8		3,5	÷	9.14		1,9		4,4	Ĭ	0,0	505		3,1
- 8	0	,6	4	,2	_8	2,9				1,8		2,5		0,0	20	M Library	2,2
9	0	4	0	8	_ '	1,5				1,7		2,0		0,0			1,8
10	0	6	0	5	ď.	2,5	5.	la l	34	0,9	PΙ	5,0	111	0,0	Sac.	150	2,9
11	0	5	1	.7	3	0,1	0.5	37	143	3,5	l i	0,1	Ыď	0,0	1945	144	1,8
12	0	3	0	3	12	1,0	ř	W. 1	Г	1,3	Г	3,0	- (0,0	963		2,2
13	0	9	1	.5		3,9	Г		Г	1,7	Г	2,6	П	0,0			2,2
14	0	.5	4	.1		2,5	Г		Г	2,0	40	2,4		0,0			2,2
В	10	6	0	9	1	3,8		13,0		1,6		4,2	62	3,4	150	6.20	3,1
С	0	5	1	0		1,3	4	1,0		2,2		1,3	30	0,8	865.7	- 4	1,4
D	0,6	0	,6	2	.1	- 4	,0	5. 1	,0	7.3	3,8	50.1	,9		- 1		2,2
Sa	0,5	0	,8	2	8,	5	,0	1	,6	. ;	3,3	1	.8		1,2		1,6
Katsim	idi										_						
1a	0,4	1	,3	2	0			•	3,7		1,5	9	0,0			70.E	2,6
2a	0,4		,6		,0			1	.4		8,3		0,0		\neg		4,9
3a	0,4	1	,3	2	5				3,4	•	1,9		0,0				2,0
4a	0,3				,2			3	3,0		0,2	(0,0				1,6
5a	0,4	0	,7	. 7	0	7		.5.1	6,		0,5	S 1	0,0		\Box		6,1
Α'	0,4	1	.5	3	5	4	.0	3	3,3		2,4	١,	.1				2,3
B,	0,5	1	,1	3	,2	- 5	,0		2,2		2,9	ř	,5		\Box		2,2
к	0,5	1	,2	3	3	4	,5	2	2,5		2,7	1	,3		1,1		1,0

Basin		II: Morp	_		_	e Daaiii.			_
Sarantapotamos	Basin	Au,km*	L,km			D		D1	F1
1 20,416 12,25 2,0 16,5 2,35 0,69 0,88 0,34 2 1,937 5,50 4.8 5,2 4,65 1,57 3,10 1,00 3 6,992 5,00 2.8 13,00 2,72 1,14 2,15 0,25 4 38,643 10,80 5,7 8,5 0,39 0,54 0,26 0,25 5 16,062 4,80 1,4 18,1 0,75 0,47 0,56 0,25 6 4,562 4,90 1,3 11,5 3,29 2,52 0,66 0,85 7 5,062 5,54 2,5 12,1 3,56 2,47 2,37 0,98 18,622 5,60 5,8 19,0 0,97 0,85 0,81 0,5 9 2,125 2,655 1,2 6,0 6,59 4,00 4,24 1,8 10 4,002 3,50 2,0 9,0 2,95 2,12 2,22 2,22 11 6,250 4,25 2,5 11,0 4,00 2,42 3,36 1,6 12 8,997 3,75 2,8 11,0 1,00 0,67 1,78 0,44 13 4,437 3,75 2,8 11,0 1,00 0,67 1,78 0,44 14 1,687 3,50 1,1 7,0 8,99 6,16 6,52 3,44 1,4 1,687 3,50 1,1 7,0 8,99 6,16 6,52 3,44 1,8 1,52 1,4 1,56 6,52 3,4 1,4 1,56 6,52 3,4 1,79 1,70 0,99 5,14 1,3 4,547 4,25 3,0 12,0 7,19 4,35 5,42 2,44 1,8 1,54 1,54 1,54 1,54 1,56 1,66 1,56 1,66 1,52 3,44 1,54 1,56 1,65 1,54 1,54 1,56 1,57 1,50 1,5	C		<u> </u>	m	km	N/km°	km/km*		Щ.
2 1,937 5,50 4,8 5,2 4,65 1,57 3,10 1,00 3 6,992 5,00 2,8 13,0 2,72 1,14 2,15 0,24 4 38,643 10,80 5,7 8,5 0,39 0,54 0,26 0,21 5 16,062 4,80 1,4 18,1 0,75 0,47 0,56 0,25 6 4,562 4,90 1,3 11,5 3,29 2,52 0,66 0,8 7 5,062 5,54 2,5 12,1 3,56 2,47 2,37 0,9 8 18,622 5,60 5,8 19,0 0,97 0,85 0,81 0,5 9 2,125 2,65 1,2 6,0 6,59 4,00 4,24 1,8 10 4,062 3,50 2,0 9,0 2,95 2,12 2,22 1,24 11 6,250 4,25 2,5 11,0 4,00 2,42 3,36 1,6 12 8,997 3,75 2,8 11,0 4,00 2,42 3,36 1,6 12 8,997 3,75 2,8 11,0 1,00 0,67 1,78 10,4 11 6,837 3,50 1,1 7,0 8,89 6,16 6,52 3,44 1,683 1,12 1,12 1,62 8,0 59,4 0,61 0,68 0,47 0,27 0,27 0,27 0,27 0,27 0,27 0,27 0,2				20	100	2.25	0.00	0.00	0.0
3 6.992 5.00 2.8 13.0 2.72 1,14 2,15 0,24 4 38.643 10,80 5,7 8.5 0,39 0,54 0,26 0,21 5 16.062 4.80 1,4 18.1 0,75 0,47 0,56 0,21 6 4.562 4.90 1,3 11,5 3,29 2,52 0,66 0,81 7 5.062 5.54 2,5 12,1 3,56 2,47 2,37 0,96 8 18.622 5,60 5,8 19,0 0,97 0,85 0,81 0,5 9 2,125 2,65 1,2 6,0 6,59 4,00 4,24 1,81 10 4.062 3,50 2,0 9,0 2,95 2,12 2,22 1,21 11 6.250 4,25 2,5 11,0 4,00 2,42 3,36 1,61 12 8,997 3,75 2,8 11,0 1,00 0,67 1,78 0,41 13 4,437 3,75 2,8 11,0 1,00 0,67 1,78 0,41 13 4,437 3,75 2,8 11,0 1,00 0,67 1,78 0,41 13 4,437 3,75 2,8 10,0 2,48 3,13 1,80 1,51 14 1,687 3,50 1,1 7,0 8,89 6,16 6,52 3,44 A 64,044 16,00 4,3 51,9 2,12 1,02 1,50 0,66 B 125,11 21,62 8,0 59,4 0,61 0,68 0,47 0,27 9 C 7,374 4,25 3,0 12,0 7,19 4,35 5,42 2,44 D 18,871 6,50 6,3 21,0 2,38 1,79 1,70 0,99 C 7,374 4,25 3,0 12,0 7,19 4,35 5,42 2,44 D 18,871 6,50 6,3 21,0 2,38 1,79 1,70 0,99 C 3,456 2 5,25 2,3 12,0 3,51 2,59 2,63 1,10 3 14,312 7,00 3,2 23,2 2,10 1,36 1,61 0,65 4,66 6 Catsimidi 1a 7,062 4,60 3,2 14,0 2,12 1,42 1,56 0,5 5 16,749 7,10 2,1 17,0 0,96 0,84 0,72 0,3 4 19,068 9,10 3,2 23,2 2,10 1,36 1,61 0,65 5 1,61 0,65 9,10 0,90 0,90 0,90 0,90 0,90 0,90 0,90	_		_	_	-				_
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7	5	16,062	-	1.4	18,1				
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9 2.125 2.65 1.2 6.0 6.59 4.00 4.24 1.81 10 4.062 3.50 2.0 9.0 2.95 2.12 2.22 1.22 1.11 6.250 4.25 2.5 11.0 4.00 2.42 3.36 1.61 12 8.997 3.75 2.8 11.0 1.00 0.67 1.78 0.44 1.81 1.687 3.50 1.1 7.0 8.89 6.16 6.52 3.44 1.81 1.687 3.50 1.1 7.0 8.89 6.16 6.52 3.44 1.81 1.687 3.50 1.1 7.0 8.89 6.16 6.52 3.44 1.81 1.687 3.50 1.1 7.0 8.89 6.16 6.52 3.44 1.81 1.81 1.81 1.81 1.81 1.81 1.81 1	7	5,062	5,54	2,5	12,1	3,56	2,47	2,37	0,99
10	8	18.622	5,60	5,8	19,0	0,97	0,85	0,81	0,5
10	9	2,125	2,65	1.2	6.0	6.59	4.00	4.24	1,88
11	10	4.062	3.50	2.0	_			_	-
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B 125,11 21,62 8,0 59,4 0,61 0,68 0,47 0,27 C 7,374 4,25 3,0 12,0 7,19 4,35 5,42 2,4 D 18,871 6,50 6,3 21,0 2,38 1,79 1,70 0,93 Sa 264,35 29,50 9,5 143,0 1,17 0,94 0,86 0,46 Exatsimidi									l
9			_	_	51,9	2,12	1,02	1,50	0,6
C 7,374 4,25 3,0 12,0 7,19 4,35 5,42 2,4 D 18,871 6,50 6,3 21,0 2,38 1,79 1,70 0,9 Sa 264,35 29,50 9,5 143,0 1,17 0,94 0,86 0,4 Katsimidi 1a 7,062 4,60 3,2 14,0 2,12 1,42 1,56 0,5 2a 4,562 5,25 2,3 12,0 3,51 2,59 2,63 1,10 3a 14,312 7,00 3,2 23,2 2,10 1,36 1,61 0,6 4a 2,000 2,20 1,1 7,1 5,00 2,05 3,50 1,00 5a 16,749 7,10 2,1 17,0 0,96 0,84 0,72 0,33 A' 19,068 9,10 3,2 24,2 1,68 1,57 1,21 0,55 B' 20,687 13,50 3,7 35,1 2,51 2,23 1,79 0,96 Ka 61,816 13,80 8,2 41,0 1,38 1,31 0,97 0,4 Basin S Er C H, m Conf. H(tot.) Rh Rn Sarantapotamos 1 6,13 0,58 0,43 974 300, 674 0,06 0,22 2 1,15 0,29 0,22 562 260 302 0,05 0,3 3 1,79 0,60 0,37 976 370 606 0,12 0,4 4 1,89 0,65 2,58 1340 338 1002 0,09 1,4 4 1,89 0,65 2,58 1340 338 1002 0,09 1,4 5 3,56 0,94 1,34 1020 338 682 0,14 0,6 6 3,92 0,49 0,30 940 280 660 0,13 0,7 7 2,22 0,46 0,28 894 260 634 0,11 0,6 8 0,97 0,87 1,03 760 240 520 0,09 0,8 8 0,97 0,87 1,03 760 240 520 0,09 0,8 11 1,70 0,66 0,25 886 160 726 0,17 0,6 12 1,34 0,90 1,00 886 540 346 0,09 0,6 13 1,34 0,63 0,40 883 540 343 0,09 1,2 14 3,18 0,42 0,11 540 120 420 0,12 0,6 14 3,18 0,42 0,11 540 120 420 0,12 0,6 15 1,34 0,90 1,00 886 540 346 0,09 0,6 13 1,34 0,63 0,40 883 540 343 0,09 1,2 14 3,18 0,42 0,11 540 120 420 0,12 0,6 15 3,38 0,65 1,05 1340 200 1140 0,05 1,1 16 1,04 0,75 0,42 886 160 726 0,17 0,6 16 1,42 0,72 0,14 700 200 500 0,12 0,6 17 0,61 0,48 842 200 642 0,09 0,6 18 2,28 0,46 0,29 842 160 682 0,13 0,7 38 2,19 0,61 0,48 842 200 642 0,09 0,6 18 3,30 0,65 1,05 551 70 481 0,07 0,8 18 2,28 0,46 0,29 842 160 682 0,13 0,7 38 2,19 0,61 0,48 842 200 642 0,09 0,6 18 3,30 0,65 1,05 551 70 481 0,07 0,8 18 3,70 0,38 0,40 842 80 760 0,08 0,8 18 3,70 0,38 0,40 842 80 760 0,08 0,8	В	125,11	21,62	8,0	59,4	0,61	0,68	0,47	0,2
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Sa 264,35 6 9.5 143,0 1,17 0,94 0,86 0,4 Katsimidi 1a 7,062 4,60 3.2 14,0 2,12 1,42 1,56 0,5 2a 4,562 5,25 2,3 12,0 3,51 2,59 2,63 1,11 3a 14,312 7,00 3,2 23,2 2,10 1,36 1,61 0,6 4a 2,000 2,20 1,1 7,1 5,00 2,05 3,50 1,0 5a 16,749 7,10 2,1 17,0 0,96 0,84 0,72 0,3 A' 19,068 9,10 3,2 24,2 1,68 1,57 1,21 0,5 B' 20,687 13,50 3,7 35,1 2,51 2,23 1,79 0,9 Ka 61,816 13,80 8,2 41,0 1,38 1,31 0,97 0,4 Basin S Er C H, m Conf. H(tot.) Rh Rn Serantapotamos 1 6,13 0,58 0,43 974 300, 674 0,06 0,2 2 1,15 0,29 0,22 562 260 302 0,05 0,3 3 1,79 0,60 0,37 976 370 606 0,12 0,4 4 1,89 0,65 2,58 13,40 338 1002 0,09 1,4 5 3,56 0,94 1,34 1020 338 682 0,14 0,66 6 3,92 0,49 0,30 940 280 660 0,13 0,7 7 2,22 0,46 0,28 894 260 634 0,11 0,66 8 0,97 0,87 1,03 760 240 520 0,09 0,8 9 2,21 0,51 0,15 700 210 490 0,18 0,6 10 1,75 0,65 0,34 660 210 450 0,13 0,7 11 1,70 0,66 0,25 886 160 726 0,17 0,66 12 1,34 0,90 1,00 886 540 343 0,09 1,2 A 3,72 0,56 0,47 974 120 854 0,05 0,4 B 2,70 0,64 1,65 1340 200 1140 0,05 1,1 C 1,42 0,72 0,14 700 200 500 0,12 0,66 C 1,42 0,72 0,14 700 200 500 0,12 0,66 C 1,42 0,72 0,14 700 200 500 0,12 0,66 C 1,42 0,72 0,14 700 200 500 0,12 0,66 C 1,42 0,72 0,14 700 200 500 0,12 0,66 C 1,42 0,72 0,14 700 200 500 0,12 0,66 C 1,42 0,72 0,14 700 200 500 0,12 0,66 C 1,42 0,72 0,14 700 200 500 0,12 0,66 C 1,42 0,72 0,14 700 200 500 0,12 0,66 C 1,42 0,72 0,14 700 200 500 0,12 0,66 C 1,42 0,73 0,42 886 160 726 0,11 0,76 Sa 3,11 0,61 0,85 1020 0 1020 0,03 0,86 C 1,48 0,54 0,60 840 80 760 0,08 0,99 B 2,21 0,51 0,48 842 200 642 0,09 0,66 A 3,70 0,64 0,69 842 160 682 0,13 0,76 Sa 3,11 0,61 0,85 1020 0 1020 0,03 0,86 C 2,28 0,46 0,29 842 160 682 0,13 0,76 Sa 3,38 0,65 1,05 551 70 481 0,07 0,86 B 3,70 0,38 0,40 842 80 760 0,08 0,99 B 3,70 0,38 0,40 842 80 760 0,08 0,99 B 3,70 0,38 0,40 842 80 760 0,08 0,99	Ç	7,374	4,25	3,0	12,0	7,19	4,35	5,42	2,4
Sa 264,35 29,50 9,5 143,0 1,17 0,94 0,86 0,46 Katsimidi 18 7.062 4,60 3,2 14,0 2,12 1,42 1,56 0,5 28 4,562 5,25 2,3 12,0 3,51 2,59 2,63 1,10 38 14,312 7,00 3,2 23,2 2,10 1,36 1,61 0,61 48 2,000 2,20 1,1 7,1 5,00 2,05 3,50 1,00 58 16,749 7,10 2,1 17,0 0,96 0,84 0,72 0,3 A' 19,068 9,10 3,2 24,2 1,68 1,57 1,21 0,5 B' 20,687 13,50 3,7 35,1 2,51 2,23 1,79 0,90 Ka 61,816 13,80 8,2 41,0 1,38 1,31 0,97 0,40 Basin S Er C H, m Conf. H(tot.) Rh Rn Sarantapotamos 1 6,13 0,58 0,43 974 300, 674 0,06 0,23 2 1,15 0,29 0,22 562 260 302 0,05 0,3 3 1,79 0,60 0,37 976 370 606 0,12 0,44 4 1,89 0,65 2,58 1340 338 1002 0,09 1,44 5 3,56 0,94 1,34 1020 338 682 0,14 0,66 6 3,92 0,49 0,30 940 280 660 0,13 0,7 7 2,22 0,46 0,28 894 260 634 0,11 0,66 8 0,97 0,87 1,03 760 240 520 0,09 0,8 9 2,21 0,51 0,15 700 210 490 0,18 0,67 10 1,75 0,65 0,34 660 210 450 0,13 0,7 11 1,70 0,66 0,25 886 160 726 0,17 0,66 13 1,34 0,90 1,00 886 540 346 0,09 0,6 14 3,18 0,42 0,11 540 120 420 0,12 0,66 A 3,72 0,56 0,47 974 120 854 0,05 0,41 A 3,72 0,56 0,47 974 120 854 0,05 0,41 B 2,70 0,64 1,65 1340 200 1140 0,05 1,11 C 1,42 0,72 0,14 700 200 500 0,12 0,66 C 1,42 0,72 0,14 700 200 500 0,12 0,66 C 1,42 0,72 0,14 700 200 500 0,12 0,66 C 1,42 0,72 0,14 700 200 500 0,12 0,66 C 1,42 0,72 0,14 700 200 500 0,12 0,66 C 1,42 0,73 0,20 451 338 160 228 0,05 0,66 C 1,42 0,72 0,14 700 200 500 0,12 0,66 C 1,42 0,73 0,20 451 338 160 228 0,05 0,66 C 1,42 0,72 0,14 700 200 500 0,12 0,66 C 1,42 0,72 0,14 700 200 500 0,12 0,66 C 1,42 0,73 0,20 451 338 160 228 0,05 0,66 C 1,42 0,73 0,20 451 338 160 228 0,05 0,66 C 1,42 0,73 0,20 451 338 160 228 0,05 0,66 C 1,42 0,73 0,20 451 338 160 20 600 0,08 0,96 B 2,70 0,64 0,65 0,47 388 160 228 0,05 0,66 B 2,70 0,64 0,65 0,47 388 160 20 0,06 0,80 A 3,70 0,65 0,47 388 160 20 0,00 0,00 0,80 C 1,44 0,55 0,45 842 80 760 0,08 0,90 B 2,24 0,51 0,65 0,47 388 160 20 0,00 0,00 0,80 C 1,42 0,54 0,54 842 80 760 0,08 0,90 B 3,70 0,38 0,40 842 80 760 0,08 0,90	D	18,871	6.50	6,3	21,0	2,38	1,79	1.70	0.9
Ratsimidi									
Katsimidi 18	Sa	264,35	29.50	9.5	143.0	1.17	0.94	0.86	0.4
Katsimidi 1a 7.062 4,60 3.2 14,0 2.12 1.42 1,56 0,5 2a 4.562 5,25 2.3 12.0 3,51 2.59 2,63 1,1 3a 14.312 7,00 3.2 23.2 2,10 1,36 1,61 0,6 4a 2.000 2,20 1,1 7,1 5,00 2,05 3,50 1,0 5a 16,749 7,10 2,1 17,0 0,96 0,84 0,72 0,3 A' 19,068 9,10 3.2 24,2 1,68 1,57 1,21 0,5 Basin S Er C H,m Conf. H(tot.) Rh Rn Sarantapotamos I 6,13 0,58 0,43 974 300. 674 0,06 0,2 2 1,15 0,29 0,22 562 260 302 0,05 0,3 3 <t< td=""><td></td><td>1 -</td><td></td><td>-,-</td><td>,.</td><td></td><td>0,51</td><td>0,00</td><td> •••</td></t<>		1 -		-,-	,.		0,51	0,00	•••
1a 7.062 4.60 3.2 14.0 2,12 1,42 1,56 0,5 2a 4.562 5.25 2.3 12.0 3.51 2,59 2,63 1,13 3a 14.312 7.00 3.2 23.2 2,10 1,36 1,61 0,6 4a 2,000 2,20 1,1 7,1 5,00 2,05 3,50 1,0 5a 16,749 7,10 2,1 17,0 0,96 0,84 0,72 0,3 A' 19,068 9,10 3,2 24,2 1,68 1,57 1,21 0,5 Basin S Er C H,m Conf H(tot) Rh Rn Sarantapotamos I 6,13 0,58 0,43 974 300 674 0,06 0,2 2 1,15 0,29 0,22 562 260 302 0,05 0,3 3 1,79 0,60 0,37	Katsin			_					_
28			4.60	32	140	2 12	1.42	1.56	0.5
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B' 20,687 13,50 3,7 35,1 2,51 2,23 1,79 0,97 Ka 61,816 13,80 8,2 41,0 1,38 1,31 0,97 0,4 Basin S Er C H, m Conf. H(tot.) Rh Rn Sarantapotamos 1 6,13 0,58 0,43 974 300, 674 0,06 0,22 2 1,15 0,29 0,22 562 260 302 0,05 0,3 3 1,79 0,60 0,37 976 370 606 0,12 0,4 4 1,89 0,65 2,58 1340 338 1002 0,09 1,4 5 3,56 0,94 1,34 1020 338 682 0,14 0,6 6 3,92 0,49 0,30 940 280 660 0,13 0,7 7 2,222 0,46 0,28 <	5a_	16,749	7,10	2,1		0,96	0,84	0,72	0,3
Ka 61.816 13.80 8,2 41.0 1.38 1,31 0,97 0,4 Basin S Er C H, m Conf. H(tot.) Rh Rn Sarantapotamos 1 6,13 0,58 0,43 974 300. 674 0,06 0,22 2 1,15 0,29 0,22 562 260 302 0,05 0,3 3 1,79 0,60 0,37 976 370 606 0,12 0,43 4 1,89 0,65 2,58 1340 338 1002 0,09 1,44 5 3,56 0,94 1,34 1020 338 682 0,14 0,65 6 3,92 0,49 0,30 940 280 660 0,13 0,7 7 2,222 0,46 0,28 894 260 634 0,11 0,65 8 0,97 0,87 1,03	A'	19,068	9,10	3,2	24.2	1,68	1,57	1,21	0,5
Ka 61.816 13.80 8,2 41.0 1.38 1,31 0,97 0,4 Basin S Er C H, m Conf. H(tot.) Rh Rn Sarantapotamos 1 6,13 0,58 0,43 974 300. 674 0,06 0,22 2 1,15 0,29 0,22 562 260 302 0,05 0,3 3 1,79 0,60 0,37 976 370 606 0,12 0,43 4 1,89 0,65 2,58 1340 338 1002 0,09 1,44 5 3,56 0,94 1,34 1020 338 682 0,14 0,65 6 3,92 0,49 0,30 940 280 660 0,13 0,7 7 2,222 0,46 0,28 894 260 634 0,11 0,65 8 0,97 0,87 1,03	В'	20,687	13,50	3,7	35,1	2,51	2.23	1,79	0.9
Basin S Er C H, m Conf. H(tot.) Rh Rn Sarantapotamos 1 6.13 0.58 0.43 974 300, 674 0.06 0.22 2 1.15 0.29 0.22 562 260 302 0.05 0.33 3 1.79 0.60 0.37 976 370 606 0.12 0.44 4 1.89 0.65 2.58 1340 338 1002 0.09 1,44 5 3.56 0.94 1,34 1020 338 682 0,14 0,65 6 3.92 0.49 0.30 940 280 660 0,13 0,67 7 2.22 0.46 0.28 894 260 634 0,11 0,63 8 0.97 0.87 1.03 760 240 520 0,09 0,88 9 2.21 0.51 0,15 700<									
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1 6,13 0,58 0,43 974 300, 674 0,06 0,2 2 1,15 0,29 0,22 562 260 302 0,05 0,3 3 1,79 0,60 0,37 976 370 606 0,12 0,4 4 1,89 0,65 2,58 1340 338 1002 0,09 1,4 5 3,56 0,94 1,34 1020 338 682 0,14 0,6 6 3,92 0,49 0,30 940 280 660 0,13 0,7 7 2,22 0,46 0,28 894 260 634 0,11 0,6 8 0,97 0,87 1,03 760 240 520 0,09 0,8 9 2,21 0,51 0,15 700 210 490 0,18 0,6 10 1,75 0,65 0,34 660 210 450 0,13 0,7 11 1,70 0,66 0,25 886 160 726 0,17 0,6 12 1,34 0,90 1,00 886 540 346 0,09 0,6 13 1,34 0,63 0,40 883 540 343 0,09 1,2 14 3,18 0,42 0,11 540 120 420 0,12 0,6 0,4 8 2,70 0,64 1,65 1340 200 1140 0,05 1,1 C 1,42 0,72 0,14 700 200 500 0,12 0,6 0 1,04 0,75 0,42 886 160 726 0,11 0,7 0,6 0 1,04 0,75 0,42 886 160 726 0,11 0,7 0,6 0 1,04 0,75 0,42 886 160 726 0,11 0,7 0,6 0 1,04 0,75 0,42 886 160 726 0,11 0,7 0,6 0 1,04 0,75 0,42 886 160 726 0,11 0,7 0,6 0,4 0,4 0,75 0,42 886 160 726 0,11 0,7 0,6 0,4 0,4 0,75 0,42 886 160 726 0,11 0,7 0,6 0,4 0,75 0,42 886 160 726 0,11 0,7 0,6 0,4 0,75 0,42 886 160 726 0,11 0,7 0,6 0,4 0,75 0,42 886 160 726 0,11 0,7 0,6 0,4 0,75 0,42 886 160 726 0,11 0,7 0,6 0,4 0,75 0,42 886 160 726 0,11 0,7 0,6 0,4 0,75 0,42 886 160 726 0,11 0,7 0,6 0,4 0,54 0,60 840 80 760 0,08 0,9 0,6 0,8 0,9 0,6 0,60 0,8 0,9 0,60 0,8 0,9 0,60 0,8 0,9 0,60 0,9 0,60 0,8 0,9 0,60 0,9 0,60 0,8 0,9 0,60 0,9 0,60 0,9 0,60 0,8 0,9 0,60 0,9 0,60 0,9 0,60 0,8 0,9 0,9 0,60 0,9 0,60 0,9 0,60 0,9 0,60 0,9 0,60 0,9 0,60 0,9 0,60 0,9 0,60 0,9 0,60 0,9 0,60 0,9 0,60 0,9 0,60 0,9 0,60 0,9 0,60 0,9 0,60 0,9 0,60 0,9 0,60 0,9 0,60 0,9 0,9 0,9 0,9 0,9 0,9 0,9 0,9 0,9 0,					_			_	
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8	Basin Sarant 1 2 3 4 5	S apotamo 6,13 1,15 1,79 1,89 3,56	Er 0,58 0,29 0,60 0,65 0,94	0,43 0,22 0,37 2,58 1,34	974 562 976 1340 1020	300, 260 370 338 338	H(tot.) 674 302 606 1002 682	Rh 0.06 0.05 0.12 0.09 0.14	0.25 0.34 0.45 1.46 0.65
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13	Basin Sarant 1 2 3 4 5 6 7 8 9	S apotamo 6,13 1,15 1,79 1,89 3,56 3,92 2,22 0,97 2,21 1,75	Er 0,58 0,29 0,60 0,65 0,94 0,49 0,46 0,87 0,51 0,65	0,43 0,22 0,37 2,58 1,34 0,30 0,28 1,03 0,15 0,34	974 562 976 1340 1020 940 894 760 700 660	260 370 338 338 280 260 240 210	H(tot.) 674 302 606 1002 682 660 634 520 490	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09	0.2 0.3 0.4 1.4 0.6 0.7 0.6 0.8
14 3,18 0,42 0,11 540 120 420 0,12 0,66 A 3,72 0,56 0,47 974 120 854 0,05 0,4 B 2,70 0,64 1,65 1340 200 1140 0,05 1,1 C 1,42 0,72 0,14 700 200 500 0,12 0,6 D 1,04 0,75 0,42 886 160 726 0,11 0,7 Sa 3,11 0,61 0.85 1020 0 1020 0,03 0,8 Catsimidi 1a 1,46 0,65 0,47 388 160 228 0,05 0,6 2a 2,28 0,46 0,29 842 160 682 0,13 0,7 3a 2,19 0,61 0,48 842 200 642 0,09 0,6 4a 2,00 0,73 0,20 451	Basin Sarant 1 2 3 4 5 6 7 8 9 10	S apotamo 6,13 1,15 1,79 1,89 3,56 3,92 2,22 0,97 2,21 1,75 1,70	Er 0.58 0.29 0.60 0.65 0.94 0.49 0.46 0.87 0.51 0.65 0.66	0,43 0,22 0,37 2,58 1,34 0,30 0,28 1,03 0,15 0,34 0,25	974 562 976 1340 1020 940 894 760 700 660 886	260 370 338 338 280 260 240 210 210	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.13	0.2 0.3 0.4 1.4 0.6 0.7 0.6 0.8 0.6
A 3.72 0.56 0.47 974 120 854 0.05 0.48 B 2.70 0.64 1.65 1340 200 1140 0.05 1.11 C 1.42 0.72 0.14 700 200 500 0.12 0.6 D 1.04 0.75 0.42 886 160 726 0.11 0.75 Sa 3.11 0.61 0.85 1020 0 1020 0.03 0.8 Catsimidi 1a 1.46 0.65 0.47 388 160 228 0.05 0.6 2a 2.28 0.46 0.29 842 160 682 0.13 0.7 3a 2.19 0.61 0.48 842 200 642 0.09 0.6 48 2.00 0.73 0.20 451 338 400 0.18 0.4 5a 3.38 0.65 1.05 551 70 481 0.07 0.8 B 3.70 0.38 0.40 842 80 762 0.06 0.8	Basin Sarant 1 2 3 4 5 6 7 8 9 10 11	S apotamo 6,13 1,15 1,79 1,89 3,56 3,92 2,22 0,97 2,21 1,75 1,70 1,34	Er 0,58 0,29 0,60 0,65 0,94 0,49 0,46 0,87 0,51 0,65 0,66 0,90	0,43 0,22 0,37 2,58 1,34 0,30 0,28 1,03 0,15 0,34 0,25 1,00	974 562 976 1340 1020 940 894 760 700 660 886 886	260 370 338 338 280 260 240 210 210 160 540	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346	0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.13 0.17 0.09	0.2: 0.3: 0.4: 1.4: 0.6: 0.6: 0.6: 0.6: 0.6: 0.6: 0.6:
B 2.70 0.64 1.65 1340 200 1140 0.05 1.1 C 1.42 0.72 0.14 700 200 500 0.12 0.6 D 1.04 0.75 0.42 886 160 726 0.11 0.7 Sa 3,11 0.61 0.85 1020 0 1020 0.03 0.8 Catsimidi 1a 1.46 0.65 0.47 388 160 228 0.05 0.6 2a 2,28 0.46 0.29 842 160 682 0.13 0.7 3a 2,19 0.61 0.48 842 200 642 0.09 0.6 4a 2.00 0.73 0.20 451 338 400 0.18 0.4 5a 3,38 0.65 1.05 551 70 481 0.07 0.8 A 2.84 0.54 0.60 840 80 760 0.08 0.9 B 3.70 0.38 0.40 842 80 762 0.06 0.8	Basin Sarant 1 2 3 4 5 6 7 8 9 10 11 12 13	S apotamo 6,13 1,15 1,79 1,89 3,56 3,92 2,22 0,97 2,21 1,75 1,70 1,34 1,34	Er 0,58 0,29 0,60 0,65 0,94 0,49 0,46 0,87 0,51 0,65 0,66 0,90 0,63	0,43 0,22 0,37 2,58 1,34 0,30 0,28 1,03 0,15 0,34 0,25 1,00 0,40	H, m 974 562 976 1340 1020 940 894 760 700 660 886 886 886 883	260 370 338 338 280 260 240 210 210 160 540	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343	0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.13 0.17 0.09	0.2 0.3 0.4 1.4 0.6 0.7 0.6 0.8 0.6 0.7 0.6 1.2
B 2.70 0.64 1.65 1340 200 1140 0.05 1.1 C 1.42 0.72 0.14 700 200 500 0.12 0.6 D 1.04 0.75 0.42 886 160 726 0.11 0.7 Sa 3,11 0.61 0.85 1020 0 1020 0.03 0.8 Catsimidi 1a 1.46 0.65 0.47 388 160 228 0.05 0.6 2a 2,28 0.46 0.29 842 160 682 0.13 0.7 3a 2,19 0.61 0.48 842 200 642 0.09 0.6 4a 2.00 0.73 0.20 451 338 400 0.18 0.4 5a 3,38 0.65 1.05 551 70 481 0.07 0.8 A 2.84 0.54 0.60 840 80 760 0.08 0.9 B 3.70 0.38 0.40 842 80 762 0.06 0.8	Basin Sarant 1 2 3 4 5 6 7 8 9 10 11 12 13	S apotamo 6,13 1,15 1,79 1,89 3,56 3,92 2,22 0,97 2,21 1,75 1,70 1,34 1,34	Er 0,58 0,29 0,60 0,65 0,94 0,49 0,46 0,87 0,51 0,65 0,66 0,90 0,63	0,43 0,22 0,37 2,58 1,34 0,30 0,28 1,03 0,15 0,34 0,25 1,00 0,40	H, m 974 562 976 1340 1020 940 894 760 700 660 886 886 886 883	260 370 338 338 280 260 240 210 210 160 540	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343	0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.13 0.17 0.09	0.2 0.3 0.4 1.4 0.6 0.7 0.6 0.8 0.6 0.7 0.6 1.2
C 1,42 0,72 0,14 700 200 500 0,12 0,6 D 1,04 0,75 0,42 886 160 726 0,11 0,7 Sa 3,11 0,61 0,85 1020 0 1020 0,03 0,8 Catsimidi 1a 1,46 0,65 0,47 388 160 228 0,05 0,6 2a 2,28 0,46 0,29 842 160 682 0,13 0,7 3a 2,19 0,61 0,48 842 200 642 0,09 0,61 4a 2,00 0,73 0,20 451 338 400 0,18 0,4 5a 3,38 0,65 1,05 551 70 481 0,07 0,8 A 2,84 0,54 0,60 840 80 760 0,08 0,9 B 3,70 0,38 0,40 842 80 762 0,06 0,8	Basin Sarant 1 2 3 4 5 6 7 8 9 10 11 12 13	S apotamo 6,13 1,15 1,79 1,89 3,56 3,92 2,22 0,97 2,21 1,75 1,70 1,34 1,34 3,18	Er 0,58 0,29 0,60 0,65 0,94 0,46 0,87 0,51 0,65 0,66 0,90 0,63 0,42	0,43 0,22 0,37 2,58 1,34 0,30 0,15 0,34 0,25 1,00 0,40 0,11	H, m 974 562 976 1340 1020 940 894 760 700 660 886 886 883 540	260 370 338 338 280 260 240 210 210 160 540 120	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.13 0.17 0.09 0.09	0.2 0.3 0.4 1.4 0.6 0.7 0.6 0.6 0.7 0.6 0.6
D 1,04 0,75 0,42 886 160 726 0,11 0,75 Sa 3,11 0,61 0,85 1020 0 1020 0,03 0,86 Catsimidi 1a 1,46 0,65 0,47 388 160 228 0,05 0,66 2a 2,28 0,46 0,29 842 160 682 0,13 0,75 3a 2,19 0,61 0,48 842 200 642 0,09 0,65 4a 2,00 0,73 0,20 451 338 400 0,18 0,4 5a 3,38 0,65 1,05 551 70 481 0,07 0,86 A 2,84 0,54 0,60 840 80 760 0,08 0,9 B 3,70 0,38 0,40 842 80 762 0,06 0,88	Basin 1 2 3 4 5 6 6 7 8 9 10 11 12 13 14 A	Sapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18	Er 0,58 0,29 0,60 0,65 0,94 0,46 0,87 0,51 0,65 0,66 0,90 0,63 0,42	0,43 0,22 0,37 2,58 1,34 0,30 0,15 0,34 0,25 1,00 0,40 0,47	H, m 974 562 976 1340 1020 940 894 760 700 660 886 886 883 540	Conf. 300, 260 370 338 338 280 260 240 210 210 160 540 120	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.13 0.17 0.09 0.09 0.12 0.05	0.2 0.3 0.4 1.4 0.6 0.7 0.6 0.6 0.7 0.6 0.6 0.6
Sa 3,11 0,61 0.85 1020 0 1020 0,03 0,8 (atsimidi 1.46 0.65 0.47 388 160 228 0,05 0,6 2a 2,28 0,46 0,29 842 160 682 0,13 0,7 3a 2,19 0,61 0,48 842 200 642 0,09 0,6 4a 2,00 0,73 0,20 451 338 400 0,18 0,4 5a 3,38 0,65 1,05 551 70 481 0,07 0,8 A 2,84 0,54 0,60 840 80 760 0,08 0,9 B 3,70 0,38 0,40 842 80 762 0,06 0,8	Basin 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B	Sapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70	Er 5 0.58 0.29 0.60 0.65 0.94 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42 0.56 0.64	0,43 0,22 0,37 2,58 1,34 0,30 0,28 1,03 0,15 0,34 0,25 1,00 0,40 0,11	H, m 974 562 976 1340 1020 940 894 760 700 660 886 883 540 974 1340	260 370 338 338 280 260 240 210 210 160 540 540 120	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.13 0.17 0.09 0.09 0.12 0.05 0.05	0.2 0.3 0.4 1.4 0.6 0.7 0.6 0.7 0.6 0.6 0.6 1.2 0.6 0.6
Catsimidi 1a 1,46 0,65 0,47 388 160 228 0,05 0,6 0,65 0,47 388 160 228 0,05 0,6 0,65 0,47 388 160 228 0,05 0,6 0,65 0,29 842 160 682 0,13 0,7 0,7 338 2,00 642 0,09 0,65 0,60 642 0,09 0,65 0,41 338 400 0,18 0,4 0,4 54 3,38 400 0,18 0,4 0,4 551 70 481 0,07 0,8 0,6 0,8 60 760 0,08 0,9 0,8 B 3,70 0,38 0,40 842 80 762 0,06 0,8	Basin Sarant 1 2 3 4 5 6 7 8 9 10 11 11 12 13 14 A B C	Sapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 3.18 3.72 2.70 1.42	Er 5 0.58 0.29 0.60 0.65 0.94 0.46 0.87 0.51 0.65 0.66 0.63 0.42 0.56 0.64 0.72	0,43 0,22 0,37 2,58 1,34 0,30 0,28 1,03 0,15 0,34 0,25 1,00 0,40 0,11 0,47 1,65 0,14	H, m 974 562 976 1340 1020 940 894 760 700 660 886 886 883 540 974 1340 700	Conf. 300, 260 370 338 338 280 260 240 210 160 540 120 120 200 200	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.13 0.17 0.09 0.12 0.05 0.05 0.12	Rn 0.2 0.3 0.4 1.4 0.6 0.7 0.6 0.6 0.7 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6
Catsimidi 1a 1,46 0,65 0,47 388 160 228 0,05 0,6 0,65 0,47 388 160 228 0,05 0,6 0,65 0,47 388 160 228 0,05 0,6 0,65 0,05 0,29 842 160 682 0,13 0,7 0,7 338 2,19 0,61 0,48 842 200 642 0,09 0,65 0,60 451 338 400 0,18 0,4 0,4 5a 3,38 0,65 1,05 551 70 481 0,07 0,8 0,8 A 2,84 0,54 0,60 840 80 760 0,08 0,9 B 3,70 0,38 0,40 842 80 762 0,06 0,8	Basin 1 2 3 4 5 6 7 8 9 10 11 11 12 13 14 A B C	Sapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 3.18 3.72 2.70 1.42	Er 5 0.58 0.29 0.60 0.65 0.94 0.46 0.87 0.51 0.65 0.66 0.63 0.42 0.56 0.64 0.72	0,43 0,22 0,37 2,58 1,34 0,30 0,28 1,03 0,15 0,34 0,25 1,00 0,40 0,11 0,47 1,65 0,14	H, m 974 562 976 1340 1020 940 894 760 700 660 886 886 883 540 974 1340 700	Conf. 300, 260 370 338 338 280 260 240 210 160 540 120 120 200 200	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.13 0.17 0.09 0.12 0.05 0.05 0.12	Rn 0.2 0.3 0.4 1.4 0.6 0.7 0.6 0.6 0.7 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6
1a 1,46 0,65 0,47 388 160 228 0,05 0,6 0,6 228 0,05 0,6 0,29 642 160 682 0,13 0,7 0,7 3a 2,19 0,61 0,48 842 200 642 0,09 0,6 0,6 4a 2,00 0,73 0,20 451 338 400 0,18 0,4 0,4 5a 3,38 0,65 1,05 551 70 481 0,07 0,8 0,0 0,08 0,9	Basin Sarant 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B C	Sapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70 1.42 1.04	Er 5 0.58 0.29 0.60 0.65 0.94 0.49 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42 0.56 0.94 0.72 0.75	0.43 0.22 0.37 2.58 1.34 0.30 0.28 1.03 0.15 0.34 0.25 1.00 0.40 0.11 0.47 1.65 0.14	H, m 974 562 976 1340 1020 940 894 760 700 660 886 883 540 974 1340 700 886	Conf. 300, 260 370 338 338 280 260 240 210 160 540 540 120 120 200 160	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500 726	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.13 0.17 0.09 0.05 0.05 0.12 0.01	0.2 0.3 0.4 1.4 0.6 0.7 0.6 0.6 0.6 0.6 0.6 0.7 0.6 0.7
2a 2,28 0,46 0,29 842 160 682 0,13 0,7 3a 2,19 0,61 0,48 842 200 642 0,09 0,6 4a 2,00 0,73 0,20 451 338 400 0,18 0,4 5a 3,38 0,65 1,05 551 70 481 0,07 0,8 A' 2,84 0,54 0,60 840 80 760 0,08 0,9 B' 3,70 0,38 0,40 842 80 762 0,06 0,8	Basin Sarant 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B C D Sa	Sapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70 1.42 1.04	Er 5 0.58 0.29 0.60 0.65 0.94 0.49 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42 0.56 0.94 0.72 0.75	0.43 0.22 0.37 2.58 1.34 0.30 0.28 1.03 0.15 0.34 0.25 1.00 0.40 0.11 0.47 1.65 0.14	H, m 974 562 976 1340 1020 940 894 760 700 660 886 883 540 974 1340 700 886	Conf. 300, 260 370 338 338 280 260 240 210 160 540 540 120 120 200 160	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500 726	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.13 0.17 0.09 0.05 0.05 0.12 0.01	0.2 0.3 0.4 1.4 0.6 0.7 0.6 0.6 0.6 0.6 0.6 0.7 0.6 0.7
2a 2,28 0,46 0,29 842 160 682 0,13 0,7 3a 2,19 0,61 0,48 842 200 642 0,09 0,6 4a 2,00 0,73 0,20 451 338 400 0,18 0,4 5a 3,38 0,65 1,05 551 70 481 0,07 0,8 A' 2,84 0,54 0,60 840 80 760 0,08 0,9 B' 3,70 0,38 0,40 842 80 762 0,06 0,8	Basin Sarant 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B C D Sa	Sapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70 1.42 1.04	Er 5 0.58 0.29 0.60 0.65 0.94 0.49 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42 0.56 0.94 0.72 0.75	0.43 0.22 0.37 2.58 1.34 0.30 0.28 1.03 0.15 0.34 0.25 1.00 0.40 0.11 0.47 1.65 0.14	H, m 974 562 976 1340 1020 940 894 760 700 660 886 883 540 974 1340 700 886	Conf. 300, 260 370 338 338 280 260 240 210 160 540 540 120 120 200 160	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500 726	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.13 0.17 0.09 0.05 0.05 0.12 0.01	0.2 0.3 0.4 1.4 0.6 0.7 0.6 0.6 0.6 0.6 0.6 0.7 0.6 0.7
3a 2,19 0,61 0,48 842 200 642 0,09 0,63 4a 2,00 0,73 0,20 451 338 400 0,18 0,4 5a 3,38 0,65 1,05 551 70 481 0,07 0,8 A' 2,84 0,54 0,60 840 80 760 0,08 0,9 B' 3,70 0,38 0,40 842 80 762 0,06 0,8	Basin Sarant 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B C D Sa	Sapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70 1.42 1.04 3.11	Er 5 0.58 0.29 0.60 0.65 0.94 0.49 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42 0.56 0.72 0.75 0.61	0.43 0.22 0.37 2.58 1.34 0.30 0.28 1.03 0.15 0.34 0.25 1.00 0.40 0.11 0.47 1.65 0.14 0.42 0.42	H, m 974 562 976 1340 1020 940 894 760 700 660 886 883 540 974 1340 700 886	Conf. 300, 260 370 338 338 280 260 240 210 160 540 540 120 200 160	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500 726	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.13 0.17 0.09 0.05 0.05 0.12 0.05 0.01 0.03	Rn 0.22 0.3 0.4 1.4 0.6 0.7 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.7 0.6 0.6 0.6 0.6 0.7 0.6 0.6 0.6 0.7 0.6 0.6 0.7 0.6 0.6 0.6 0.7 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6
4a 2.00 0.73 0.20 451 338 400 0.18 0.4 5a 3,38 0.65 1.05 551 70 481 0.07 0.8 A' 2.84 0.54 0.60 840 80 760 0.08 0.9 B' 3.70 0.38 0.40 842 80 762 0.06 0.8	Basin 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B C D Sa Catsim	S apotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70 1.42 1.04 3.11 nidi 1.46	Er 5 0.58 0.29 0.60 0.94 0.49 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42 0.56 0.72 0.75 0.61	0.43 0.22 0.37 2.58 1.34 0.30 0.28 1.03 0.15 0.34 0.25 1.00 0.40 0.41 0.42 0.42 0.42 0.42 0.42	H, m 974 562 976 1340 1020 940 894 760 700 660 886 883 540 974 1340 700 886 1020	Conf. 300, 260 370 338 338 280 260 240 210 160 540 120 200 160 0	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500 726	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.13 0.17 0.09 0.12 0.05 0.12 0.01 0.03	Rn 0.22 0.33 0.44 1.44 0.66 0.77 0.66 0.66 0.66 0.74 1.11 0.66 0.77 0.88
5a 3,38 0,65 1,05 551 70 481 0,07 0,8 A 2,84 0,54 0,60 840 80 760 0,08 0,9 B 3,70 0,38 0,40 842 80 762 0,06 0,8	Basin 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B C D Sa Katsim	S apotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70 1.42 1.04 3.11 nidi 1.46 2.28	Er 5 0.58 0.29 0.60 0.65 0.49 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42 0.56 0.72 0.75 0.61 0.65 0.64	0,43 0,22 0,37 2,58 1,34 0,25 1,03 0,15 0,34 1,03 0,47 1,65 0,14 0,42 0,42 0,42 0,85	H, m 974 562 976 1340 1020 940 894 760 700 660 886 883 540 974 1340 700 886 1020	260 370 338 338 280 260 240 210 160 540 120 120 200 160 160	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500 726 1020	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.13 0.17 0.09 0.12 0.05 0.05 0.12 0.01 0.03	Rn 0.2 0.3 0.4 1.4 0.6 0.7 0.6 0.6 0.6 0.6 0.6 0.7 0.6 0.6 0.7 0.6 0.7 0.6 0.7 0.6 0.7 0.6 0.7 0.6 0.7 0.6 0.7 0.7 0.6 0.7 0.6 0.7 0.6 0.7 0.6 0.7 0.6 0.6 0.7 0.6 0.6 0.7 0.6 0.6 0.7 0.6 0.6 0.6 0.7 0.6 0.6 0.6 0.7 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6
A 2.84 0.54 0.60 840 80 760 0.08 0.9 B 3.70 0.38 0.40 842 80 762 0.06 0.89	Basin 1 2 3 4 4 5 6 7 8 9 10 11 12 13 14 A B C D Sa Catsim 1a 3 3a	Sapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70 1.42 1.04 3.11 iidi 1.46 2.28 2.19	Er 5 0.58 0.29 0.60 0.65 0.49 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42 0.56 0.72 0.75 0.61 0.65	0.43 0.22 0.37 2.58 1.34 0.28 1.03 0.15 0.34 0.25 1.00 0.40 0.11 0.47 1.65 0.14 0.42 0.85	H, m 974 562 976 1340 1020 940 894 760 700 660 886 883 540 974 1340 700 886 1020 886 1020	260 370 338 338 280 260 240 210 160 540 120 200 160 160 160	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500 726 1020	Rh 0.06 0.05 0.12 0.09 0.14 0.03 0.11 0.09 0.18 0.13 0.17 0.09 0.12 0.05 0.05 0.12 0.01 0.03 0.01 0.03	Rn 0.22 0.3 0.4 1.4 0.6 0.7 0.6 0.6 0.6 0.7 0.6 0.7 0.6 0.7 0.6 0.7 0.6 0.7 0.6 0.7 0.6 0.7 0.6 0.7 0.6 0.6 0.7 0.6 0.6 0.7 0.6 0.6 0.6 0.7 0.6 0.6 0.6 0.6 0.7 0.6 0.6 0.6 0.7 0.6 0.6 0.6 0.7 0.6 0.6 0.7 0.7 0.6 0.6 0.7 0.6 0.6 0.7 0.7 0.6 0.6 0.7 0.7 0.6 0.6 0.7 0.7 0.6 0.6 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7
B 3.70 0,38 0,40 842 80 762 0,06 0,8	Basin 1 2 3 4 4 5 6 7 8 9 10 11 12 13 14 A B C D Sa Catsin 1a 3 3a 4a	S apotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70 1.42 1.04 3.11 nidi 1.46 2.28 2.19 2.00	Er 5 0.58 0.29 0.60 0.65 0.49 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42 0.56 0.64 0.72 0.75 0.61 0.65	0,43 0,22 0,37 2,58 1,34 0,30 0,10 0,30 0,13 1,00 0,47 1,65 0,14 0,42 0,42 0,42 0,85 0,44 0,42 0,42 0,42 0,43 0,43 0,43 0,43 0,44 0,42 0,43 0,43 0,43 0,43 0,43 0,43 0,43 0,43	H, m 974 562 976 1340 1020 940 894 760 700 660 886 883 540 974 1340 700 886 1020 388 842 451	Conf. 300, 260 370 338 338 280 260 240 210 160 540 120 200 160 160 160 160 160 338	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500 726 1020	Rh 0.06 0.05 0.12 0.09 0.14 0.03 0.11 0.09 0.18 0.13 0.17 0.09 0.12 0.05 0.12 0.01 0.03 0.01 0.01 0.03	Rn 0.2 0.3 0.4 1.4 0.6 0.7 0.6 0.6 0.7 0.6 0.7 0.6 0.7 0.6 0.7 0.6 0.7 0.6 0.7 0.6 0.7 0.7 0.6 0.7 0.7 0.6 0.7 0.7 0.6 0.7 0.7 0.6 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7
	Basin Sarant 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B C D Sa Catsin 1a 3a 4a 5a	S apotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70 1.42 1.04 3.11 iddi 1.46 2.28 2.19 2.00 3.38	Er 5 0.58 0.29 0.60 0.65 0.94 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42 0.56 0.72 0.75 0.61 0.65 0.65	0,43 0,22 0,37 2,58 1,34 0,30 0,28 1,03 0,15 0,47 1,65 0,14 0,42 0,42 0,42 0,42 0,42 0,42 0,43 0,42 0,43 0,42 0,43 0,43 0,44 0,42 0,42 0,43 0,43 0,43 0,43 0,43 0,43 0,43 0,43	H, m 974 562 976 1340 1020 940 894 760 700 660 886 883 540 974 1340 700 886 1020 388 842 842 451 551	Conf. 300, 260 370 338 338 280 260 240 210 210 160 540 120 200 160 0 160 160 200 338 70	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500 726 1020 228 682 642 400 481	Rh 0.06 0.05 0.12 0.09 0.14 0.03 0.11 0.09 0.18 0.13 0.17 0.09 0.12 0.05 0.12 0.05 0.11 0.03	Rn 0.22 0.33 0.44 1.44 0.65 0.77 0.66 0.75 0.66 0.75 0.66 0.75 0.86 0.75 0.86 0.75 0.86 0.75 0.86 0.75 0.86 0.75 0.75 0.86 0.75 0.75 0.75 0.75 0.75 0.75 0.75 0.75
Ka 1.68 0.64 0.73 842 0 842 0.06 0.99	Basin Sarant 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B C D Sa Catsin 1a 3a 4a 5a A'	Sapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70 1.42 1.04 3.11 iddi 1.46 2.28 2.19 2.00 3.38 2.84	Er 0.58 0.29 0.60 0.65 0.94 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42 0.56 0.64 0.72 0.75 0.61 0.65 0.61 0.65 0.65	0,43 0,22 0,37 2,58 1,34 0,30 0,15 0,35 1,00 0,47 1,65 0,14 0,42 0,42 0,85 0,47 0,29 0,48 0,20 0,48 0,20 0,48 0,20 0,48 0,20 0,40 0,20 0,40 0,40 0,40 0,40 0,40	H, m 974 562 976 1340 1020 940 894 760 700 660 886 883 540 974 1340 700 886 1020 388 842 451 551 840	Conf. 300, 260 370 338 338 280 260 240 210 160 540 120 200 160 0 160 160 160 160 338 70 80	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500 726 1020 228 682 642 400 481 760	Rh 0.06 0.05 0.12 0.09 0.14 0.03 0.11 0.09 0.18 0.13 0.17 0.09 0.12 0.05 0.12 0.05 0.11 0.03	Rn 0.22 0.33 0.44 1.44 0.65 0.77 0.66 0.65 0.75 0.66 0.77 0.86 0.77 0.86 0.77 0.86
Ka 1.68 0.64 0.73 842 0 842 0.06 0.99	Basin Sarant 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B C D Sa Catsin 1a 3a 4a 5a A'	Sapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70 1.42 1.04 3.11 iddi 1.46 2.28 2.19 2.00 3.38 2.84	Er 0.58 0.29 0.60 0.65 0.94 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42 0.56 0.64 0.72 0.75 0.61 0.65 0.61 0.65 0.65	0,43 0,22 0,37 2,58 1,34 0,30 0,15 0,35 1,00 0,47 1,65 0,14 0,42 0,42 0,85 0,47 0,29 0,48 0,20 0,48 0,20 0,48 0,20 0,48 0,20 0,40 0,20 0,40 0,40 0,40 0,40 0,40	H, m 974 562 976 1340 1020 940 894 760 700 660 886 883 540 974 1340 700 886 1020 388 842 451 551 840	Conf. 300, 260 370 338 338 280 260 240 210 160 540 120 200 160 0 160 160 160 160 338 70 80	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500 726 1020 228 682 642 400 481 760	Rh 0.06 0.05 0.12 0.09 0.14 0.03 0.11 0.09 0.18 0.13 0.17 0.09 0.12 0.05 0.12 0.05 0.11 0.03	Rn 0.22 0.33 0.44 1.44 0.65 0.77 0.66 0.65 0.75 0.66 0.77 0.86 0.77 0.86 0.77 0.86
	Basin Saranti 1 2 3 4 4 5 6 6 7 8 9 10 11 12 13 14 A B C D Sa Katsim A 4 5 5 A A B B 5 8 A B	Sapotamo 6,13 1,15 1,79 1,89 3,56 3,92 2,22 0,97 2,21 1,75 1,70 1,34 1,34 3,18 3,72 2,70 1,42 1,04 3,11 nidi 1,46 2,28 2,19 2,00 3,38 2,84 3,70	Er 9.58 0.29 0.60 0.65 0.94 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42 0.56 0.64 0.72 0.75 0.61 0.65 0.61 0.65 0.61 0.73 0.65 0.65	0,43 0,22 0,37 2,58 1,34 0,30 0,25 1,03 0,47 1,65 0,14 0,42 0,85 0,47 0,29 0,48 0,20 0,40 0,20 0,40 0,40 0,40 0,40 0,40	H, m 974 562 976 1340 1020 940 894 760 700 660 886 883 540 974 1340 700 886 1020 388 842 451 851 840 842	Conf. 300, 260 370 338 338 280 260 240 210 210 160 540 120 200 160 0 160 0 160 0 160 0 80	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500 726 1020 228 682 642 400 481 760 762	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.17 0.09 0.12 0.05 0.12 0.05 0.12 0.05 0.11 0.03	Rn 0.23 0.34 1.44 0.65 0.75 0.66 0.66 0.75 0.66 0.75 0.86 0.75 0.86 0.75 0.86 0.75 0.86 0.75 0.86 0.75 0.86 0.75 0.86 0.75 0.86 0.75 0.86 0.75 0.86 0.75 0.75 0.86 0.75 0.75 0.86 0.75 0.75 0.86 0.75 0.75 0.86 0.75 0.75 0.86 0.75 0.75 0.86 0.75 0.86 0.75 0.86 0.75 0.86 0.75 0.86 0.75 0.86 0.75 0.86 0.86 0.86 0.86 0.86 0.86 0.86 0.86

tectonism, while only that of the northeastern part is dendritic.

TABLE III: Characteristics of the hydrographical basins and their concentration time.

		NTRATION IME	RAINFALL UNIFORMITY COEFFICIEN				
BASIN		MINUTES	FANTONI	SPECHT	FRUHLING		
E1.	2,97	178	0,29	0,72	0,54		
E2	5,18	311	0,14	0,67	0,42		
E3	3,72	223	0,25	0,71	0,51		
E4	5,86	352	0,08	0,64	0,32		
E5	6,07	364	0,08	0,63	0,31		
E6	2,79	168	0,49	0,77	0,62		
E7	2,71	163	0,51	0.78	0,63		
E8	4,05	243	0,27	0,71	0,52		

The second stream named Katsimidi is smaller than Sarantapotamos and belongs to the 5th order too. Its drainage basin lies northern of the Sarantapotamos basin. It is constituted by two 4rth order drainage basins whose long axes have an E-W direction. The shape of the drainage network is dendritic (Tables I and II).

Both streams drain a broad area of Western Attica and flow into the Gulf of Elefsina. They follow an almost parallel direction through Thriassion Pedion and 1,5 Km just before the city of Elefsina one stream bends eastwards and the other westwards, flowing into the sea.

CALCULATION OF THE PEAK STORM RUNOFF (Qp) OF SARANTAPOTAMOS AND KASTIMIDI STREAMS DRAINAGE BASINS

According to the division system of the Directory of Hydrology and Natural Resources of the Ministry of Industry, the studied area belongs to the hydrological department of Attica (06). This is a very general division and that is why we performed a more detailed study whose results are presented below:

In order to calculate the maximum storm runoff (Qp) and the sediment yield of Sarantapotamos and Katsimidi streams, it is necessary to estimate these parameters, not only at the river exits, but also at certain places of the drainage basins. This is important to estimate the participation of each basin to the total discharge. We divided the drainage basins in 8 parts. which correspond to groups of drainage sub-basins that drain certain geographic areas or lie next to cities. The peak storm runoff (Qp) and the sediment yield, were calculated at the exits of these drainage sub-basins. These locations are shown on the map of Figure 1 as E1,E2.... E8.. The E1 measuring station is near Vilia village and measures the runoff and sediment yield of the drainage basins of Kitheronas mountain. E2 station estimates surplus quantities that come from mountain Pastra. E3 station estimates the participation of the St. Vlassios stream, which is the longer tributary of Sarantapotamos and drains the northern slopes of mount Pateras, while E4 station is that which comes from Pamitha mountain, E6 and E7 stations estimate the runoff of 4th order drainage basins of Katsimidi stream near Mandra city. Finally E5 and E8 estimate the total discharge of Sarantapotamos and Katimidi streams correspondingly.

Geometry, basin concentration time and the uniformity coefficient of these drainage basins were estimated. The results are given in Table III. The last two coefficients are particularly necessary for the determination of peak storm runoff and therefore for the flood studies. As it is mentioned below these parameters are necessary for the study and analysis of the water-balance of each studied drainage basin.

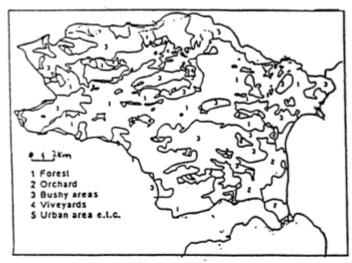


Fig. 2: Map of land use/ cover.

The mean annual height of precipitation is 374,5mm and the mean annual temperature is 18,3°C according to the measurements of the Meteorological Station of Elefsina for the observation time-period 1958 - 1992.

Based on the maximum 24 hour rainfalls we estimated, according to Gumbel analysis, the expected rainfall height for a recurrence period of 25, 50 and 100 years, as below.

62,2	< 25 <	113,0
69,4	< 50 <	121,1
76,6	< 100 <	139,2

Calculations

In order to calculate the runoff curve number or the specific runoff coefficient (CN) for every elementary homogeneous part of soil area of Sarantapotamos of the drainage basins and Kastimidi streams we carried out the following analyses:

- a) We drew a map of land use/cover, using the data of HAGS. The map was completed by field observation, (Figure 2). We can distinguish the following categories.
 1. Forest, 2. Annual cultivation, 3. Bushy areas, 4. Vineyards, 5. Uncultivated areas and urban areas. The results of the land use/cover are shown classified in Table IV.
- b) A hydrolithologic classification map was drawn. The lithological formations were classified in 4 categories according to the permeability coefficients. These categories are: 1. permeable formations, 2. moderately permeable formations, 3. low permeable formations, 4. impermeable formation. Figure 3 and Table V show the results of the hydrolithologic classification of the geological formations of each studied basin.
- c) We calculated the runoff curve number (CN). This determination is a derivative of the land use/cover diagram in figure 2 and the hydrolithologic classification diagram in figure 3. Data from airphotos and satellite photos of the studied area were used (Sojuzcarta, scale 1:210.000, 1984).

The runoff curve numbers (CN) which was accepted for every combination of land use and hydrolithologic classification was calculated by the method

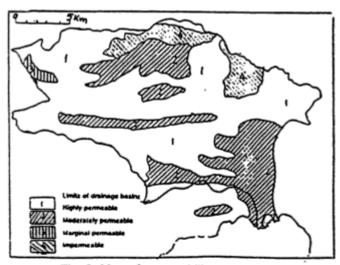


Fig. 3: Map of permeability classification.

TABLE IV: Land uses/cover of the surface of the hydrographic

	Dasin	s (o calegories	basins (5 categories).										
	FOREST AREA	CULTIVATIONS	BUSHY	PLANTS AREA	DESERT LAND & URBAN AREA								
BASIN	PERCENT-	PERCENT-	PERCENT-	PERCENT- AGE %	PERCENTAGE %								
E1	26,00		54,00	7,00	13,00								
E2	34,00		42,00	8,00	16,00								
E3	72,50	2,50	16,00	4,00	5,00								
E4	54,00	1,00	28,00	5,00	12,00								
E5	49,61	4,60	30,00	4,59	11,20								
E6	74,00	6,00	18,00		2,00								
E7	36,00		59,00	1,00	4,00								
E8	48,00	14,00	34,50	0,50	3,00								

TABLE V: Permeability classification of geological formations

of the hydrographic basins.

	HIGHLY PERMEABLE	MODERATELY PERMEABLE	MARGINALLY PERMEABLE	IMPERMEABLE
BASIN NAME	PERCENT- AGE %	PERCENT- AGE %	PERCENT- AGE %	PERCENT- AGE %
Ε1	63,80	19,20	9,90	7,10
E2	48,10	27,90	5,10	18,90
E3	75,90	24,10		
E4	60,60	25,10	2,60	11,70
E5	55,83	31,03	2,39	10,75
E6	61,70	38,30		
E7	92,30	7,70		
E8	61,90	38,10		

TABLE VI: Runoff Curve Number of the hydrographic basins.

	R	UNOFF CU	RVE NUME	BER (CN)		
BASIN	30-35	49-62	67-74	75-84	85-95	MEAN
NAME	m2	m2	m2	m2	m2	CN OF
						BASIN
E1	24430704	6107676	6616649	12215352	1526919	53
E2	46294255	6255980	27526314	42540666	2502392	59
E3	48674097	1921346	12168524		1280897	42
E4	124518752	14170977	43442177	45068354	5110844	51
E5	124998559	18820036	58858361	45068354	5110844	53
E6	13614449	1793123	6397684	332060		46
E7	18750331	1056357	507864			35
E8	35259379	6855990	12386873	1901241	1209881	46

of S.C.S. of the U.S.A. The diagram in figure 4 shows five (5) categories of the runoff curve numbers. For each category we used a single mean runoff curve number. The spreading of each one of the above five runoff curve number categories in the eight studied drainage basins of Sarantapotamos and Katsimidi

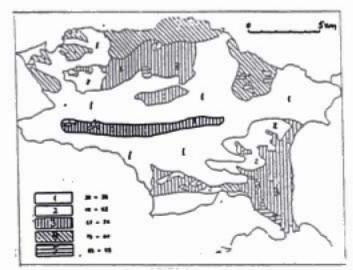


Fig. 4: Map of specific runoff coefficisent. 1)30-35, 2)36-62 ,3)63-74 ,4)75-84 ,5)85-95

streams, is shown in diagrams (Fig. 4) and the mean (CN) in table VI.

CALCULATION OF THE PEAK STORM RUNOFF (Qp)
OF SARANTAPOTAMOS AND KASTIMIDI STREAMS
DRAINAGE BASINS

According to the division system of the Directory of Hydrology and Natural Resources of the Ministry of Industry, the studied area belongs to the hydrological department of Attica (06). This is a very general division and that is why we performed a more detailed study whose results are presented below:

In order to calculate the maximum storm runoff (Qp) and the sediment yield of Sarantapotamos and Katsimidi streams, it is necessary to estimate these parameters, not only at the river exits, but also at certain places of the drainage basins. This is important to estimate the participation of each basin to the total discharge. We divided the drainage basins in 8 parts, which correspond to groups of drainage sub-basins that drain certain geographic areas or lie next to cities. The peak storm runoff (Qp) and the sediment yield, were calculated at the exits of these drainage sub-basins. These locations are shown on the map of Figure 1 as E1,E2.... E8.. The E1 measuring station is near Vilia village and measures the runoff and sediment yield of the drainage basins of Kitheronas mountain. E2 station estimates surplus quantities that come from mountain Pastra. E3 station estimates the participation of the St. Vlassios stream, which is the longer tributary of Sarantapotamos and drains the northern slopes of mount Pateras, while E4 station is that which comes from Parnitha mountain, E6 and E7 stations estimate the runoff of 4th order drainage basins of Katsimidi stream near Mandra city. Finally E5 and E8 estimate the total discharge of Sarantapotamos and Katimidi streams correspondingly.

Geometry, basin concentration time and the uniformity coefficient of these drainage basins were estimated. The results are given in Table III. The last two coefficients are particularly necessary for the determination of peak storm runoff and therefore for the flood studies. As it is mentioned below these parameters are necessary for the study and analysis of the water-balance of each studied drainage basin.

	II: Morph			rainage	basin.			-
Basin	Au.km²	L.km	9.00	Ρ.	D,	F,	D1	F1
_			m	km	N/km	km/km²	_	_
	apotamo	THE REAL PROPERTY.			2.25	0.00	0.00	0.24
1	and the second name of	12,25	_	16.5	2,35		0,88	-
2	1,937	5,50		5.2	4,65	1,57	3,10	and an area
3	6,992	5,00	-	13.0	2.72	1,14	2,15	
4	38,643		-	8,5	0,39	0,54	0.26	and steps
5	16.062	4,80	-	18,1	0,75	0,47	0,56	-
6	4,562	4,90	1,3	11,5	3,29	2.52	0,66	
_7	5.062	5.54	_	12,1	3,56	2.47		0.99
В	18,622	5,60	5.8	19.0	-	0.85	0,81	_
9	2,125	2,65	1.2	6.0	6,59	4,00	4,24	4 2 2
10	4.062	3,50	2,0	9,0	2,95	2,12	_	1,26
11	6.250	4,25	2.5	11,0	4,00	2,42	10000	1,60
12	8,997	3,75	2,8	11,0	1,00	0,67	_	0,44
13	4.437	3,75	2.8	_	2.48	3,13	-	1,58
14	1,687	3,50	1.1	7,0	8,89	6,16	6,52	3,44
					Lanca and			
A	64,044	16,00	Annual Section 1	_	2,12	1,02	_	0,61
8	125,11	21.62	8,0	59,4	0,61	0,68	0,47	0,27
	9	-						
C	7.374	4,25	3.0	12,0	7,19	4,35	5,42	2,44
D	18,871	6,50	6.3	21.0	2,38	1,79	1,70	0,97
				700 m	124500	SLEDIYOT I		
Sa	264,35	29.50	9.5	143,0	1,17	0,94	0.86	0.44
	6							
Katsin	ndi							_
1a	7,062	4,60		14.0	2,12	1,42		0.57
2a	4,562	5,25	2,3	12.0	3,51	2,59	2,63	1,10
3a	14,312	7,00	3,2	23.2	2,10	1,36	1,61	0,63
48	2,000	2,20	1,1	7.1	5,00	2,05	3,50	1,05
5a	16,749	7,10	2,1	17,0	0.96	0.84		0,30
A'	19,068	9,10	3,2	24,2	1,68	1,57	1,21	0.53
B'	20,687	13,50	3,7	35,1	2,51	2,23	1,79	0,92
Ka	61,816	13,80	8,2	41,0	1,38	1,31	0,97	0,47
Basin	S	Er	8,2 C	41,0 H, m		1,31 H(tot.)	0,97 Rh	0,47 Rn
Basin Saran	S	Er	С	H, m	Conf.	H(tot.)	Rh	Rn
Basin Saran	S tapotamo 6,13	Er 0.58	C 0,43	H, m	Conf. 300.	H(tot.)	Rh 0,06	Rn 0.29
Basin Saran 1 2	8 tapotamo 6,13 1,15	6 0,58 0,29	0.43 0.22	H, m 974 562	300. 260	H(tot.) 674 302	Rh 0.06 0.05	Rn 0.29 0.34
Basin Saran 1 2 3	S tapotamo 6,13 1,15 1,79	0,58 0,29 0,60	0,43 0,22 0,37	974 562 976	300, 260 370	H(tot.) 674 302 606	0,06 0.05 0.12	0.29 0.34 0.42
Basin Saran 1 2 3 4	S tapotamo 6,13 1,15 1,79 1,89	0.58 0.29 0.60 0.65	0,43 0,22 0,37 2,58	974 562 976 1340	300, 260 370 338	674 302 606 1002	0,06 0.05 0.12 0.09	0.29 0.34 0.42 1,40
Basin Saran 1 2 3 4 5	\$ tapotamo 6,13 1,15 1,79 1,89 3,56	0.58 0.29 0.60 0.65 0.94	0,43 0,22 0,37 2,58 1,34	974 562 976 1340 1020	300, 260 370 338 338	674 302 606 1002 682	Rh 0.06 0.05 0.12 0.09	0.29 0.34 0.42 1.40 0.63
Basin Saran 1 2 3 4 5 6	\$ tapotamo 6,13 1,15 1,79 1,89 3,56 3,92	0.58 0.58 0.29 0.60 0.65 0.94 0.49	0,43 0,22 0,37 2,58 1,34 0,30	974 562 976 1340 1020 940	300, 260 370 338 338 280	674 302 606 1002 682 660	Rh 0.06 0.05 0.12 0.09 0.14 0.13	Rn 0.29 0.34 0.42 1,40 0.63 0.77
Basin Saran 1 2 3 4 5 6 7	\$ tapotamo 6,13 1,15 1,79 1,89 3,56 3,92 2,22	5 0.58 0.29 0.60 0.65 0.94 0.49	0,43 0,22 0,37 2,58 1,34 0,30 0,28	974 562 976 1340 1020 940 894	300, 260 370 338 338 280 260	674 302 606 1002 682 660 634	0.06 0.05 0.12 0.09 0.14 0.13	0.29 0.34 0.42 1.40 0.63 0.77 0.69
Basin Saran 1 2 3 4 5 6 7 8	S tapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97	Er 0.58 0.29 0.60 0.65 0.94 0.49 0.46	0,43 0,22 0,37 2,58 1,34 0,30 0,28 1,03	974 562 976 1340 1020 940 894 760	300, 260 370 338 338 280 260 240	674 302 606 1002 682 660 634 520	0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09	0.29 0.34 0.42 1.40 0.63 0.77 0.69 0.88
Basin Saran 1 2 3 4 5 6 7 8	\$ fapotamo 6,13 1,15 1,79 1,89 3,56 3,92 2,22 0,97	0.58 0.29 0.60 0.65 0.94 0.49 0.46 0.87	0,43 0,22 0,37 2,58 1,34 0,30 0,28 1,03	974 562 976 1340 1020 940 894 760	300, 260 370 338 338 280 260 240	674 302 606 1002 682 660 634 520	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09	0.29 0.34 0.42 1,40 0.63 0,77 0.69 0.88
Basin Saran 1 2 3 4 5 6 7 8 9	\$ fapotamo 6,13 1,15 1,79 1,89 3,56 3,92 2,22 0,97 2,21 1,75	0.58 0.29 0.60 0.65 0.94 0.49 0.46 0.87 0.51 0.65	0,43 0,22 0,37 2,58 1,34 0,30 0,28 1,03 0,15 0,34	974 562 976 1340 1020 940 894 760 700 660	300, 260 370 338 338 280 260 240 210	H(tot.) 674 302 606 1002 682 660 634 520 490	Rh 0.05 0.12 0.09 0.14 0.13 0.11 0.09	0.29 0.34 0.42 1.40 0.63 0.77 0.69 0.88 0.61 0.72
Basin Saran 1 2 3 4 5 6 7 8 9 10	S tapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75	5 0.58 0.29 0.60 0.65 0.94 0.49 0.46 0.87 0.51 0.65 0.66	0,43 0,22 0,37 2,58 1,34 0,30 0,28 1,03 0,15 0,34 0,25	974 562 976 1340 1020 940 894 760 700 660 886	300, 260 370 338 338 280 260 240 210 210	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726	0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.13 0.13	0.29 0.34 0.42 1.40 0.63 0.77 0.69 0.88 0.61 0.72 0.60
Basin Saran 1 2 3 4 5 6 7 8 9	\$ fapotamo 6,13 1,15 1,79 1,89 3,56 3,92 2,22 0,97 2,21 1,75	5 0.58 0.29 0.60 0.65 0.94 0.46 0.87 0.51 0.65 0.66 0.90	0,43 0,22 0,37 2,58 1,34 0,30 0,28 1,03 0,15 0,34 0,25 1,00	974 562 976 1340 1020 940 760 700 660 886 886	300, 260 370 338 338 280 260 240 210 210 160 540	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346	0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.17 0.09	0.29 0.34 0.42 1.40 0.63 0.77 0.69 0.88 0.61 0.72 0.60 0.67
Basin Saran 1 2 3 4 5 6 7 8 9 10	S tapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75	5 0.58 0.29 0.60 0.65 0.94 0.46 0.87 0.51 0.65 0.66 0.90	0,43 0,22 0,37 2,58 1,34 0,30 0,28 1,03 0,15 0,34 0,25 1,00	974 562 976 1340 1020 940 894 760 700 660 886 886 883	300, 260 370 338 338 280 260 240 210 210 160 540	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343	0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.17 0.09	0.29 0.34 0.42 1.40 0.63 0.77 0.69 0.88 0.61 0.72 0.60 0.67 1.26
Basin Saran 1 2 3 4 5 6 7 8 9 10 11	\$ tapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34	5 0.58 0.29 0.60 0.65 0.94 0.46 0.87 0.51 0.65 0.66 0.90 0.63	0,43 0,22 0,37 2,58 1,34 0,30 0,28 1,03 0,15 0,34 0,25 1,00	974 562 976 1340 1020 940 760 700 660 886 886	300, 260 370 338 338 280 260 240 210 210 160 540	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346	0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.17 0.09	0.29 0.34 0.42 1.40 0.63 0.77 0.69 0.88 0.61 0.72 0.60 0.67 1.26
Basin Saran 1 2 3 4 5 6 7 8 9 10 11 12 13	\$ tapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18	Er 0.58 0.29 0.60 0.95 0.94 0.46 0.87 0.51 0.65 0.68 0.90 0.63	0,43 0,22 0,37 2,58 1,34 0,30 0,28 1,03 0,15 1,03 0,25 1,00 0,40 0,41	H, m 974 562 976 1340 1020 940 894 760 700 660 886 886 883 540	260 370 370 338 338 280 260 240 210 210 160 540 120	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.13 0.17 0.09 0.12	Rn 0.29 0.34 0.42 1.40 0.63 0.77 0.69 0.88 0.61 0.72 0.60 0.67 1.26
Basin Saran 1 2 3 4 5 6 7 8 9 10 11 12 13	\$ tapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34	Er 0.58 0.29 0.60 0.95 0.94 0.46 0.87 0.51 0.65 0.68 0.90 0.63	0,43 0,22 0,37 2,58 1,34 0,30 0,28 1,03 0,15 1,03 0,25 1,00 0,40 0,41	974 562 976 1340 1020 940 894 760 700 660 886 886 883	260 370 370 338 338 280 260 240 210 160 540 120	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.17 0.09 0.10 0.10 0.10 0.10 0.10 0.10 0.10	Rn 0.29 0.34 1,40 0,63 0,72 0,69 0,61 0,67 1,26 0,69 0,67 1,26 0,69
Basin Saran 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B	\$ tapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70	Er 0.58 0.29 0.60 0.65 0.94 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42	0,43 0,22 0,37 2,58 1,34 0,30 0,28 1,03 0,15 0,25 1,00 0,40 0,11 0,47 1,65	H, m 974 582 976 1340 1020 940 894 760 700 660 886 883 540 974	260 300, 260 370 338 338 280 260 240 210 160 540 120	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.17 0.09 0.12 0.05 0.05 0.05	Rn 0.29 0.34 1,40 0,63 0,72 0,69 0,61 0,72 0,60 0,67 1,26 0,69 0,48 1,11
Basin Saran 1 2 3 4 5 6 7 8 9 10 11 12 13 14	S tapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70	Er 0.58 0.29 0.60 0.65 0.94 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42 0.56	0.43 0.22 0.37 2.58 1.34 0.30 0.28 1.03 0.15 1.00 0.40 0.41 1.65 0.14	974 562 976 1340 1020 940 894 760 700 660 886 886 883 540 974 1340	260 370 370 338 338 280 260 240 210 160 540 120	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.17 0.09 0.12 0.05 0.05 0.05	Rn 0.29 0.34 1,40 0,63 0,72 0,69 0,61 0,67 1,26 0,69 0,67 1,26 0,69
Basin Saran 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B	\$ tapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70	Er 0.58 0.29 0.60 0.65 0.94 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42 0.56	0.43 0.22 0.37 2.58 1.34 0.30 0.28 1.03 0.15 1.00 0.40 0.41 1.65 0.14	H, m 974 582 976 1340 1020 940 894 760 700 660 886 883 540 974	260 300, 260 370 338 338 280 260 240 210 160 540 120	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.13 0.17 0.09 0.05 0.05 0.05	Rn 0.29 0.34 0.42 1,40 0.63 0.77 0.69 0.88 0.61 1,26 0.69 0.69 0.48
Basin Saran 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B	S tapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70	Er 0.58 0.29 0.60 0.65 0.94 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42 0.56	0.43 0.22 0.37 2.58 1.34 0.30 0.28 1.03 0.15 1.00 0.40 0.41 1.65 0.14	974 562 976 1340 1020 940 894 760 700 660 886 886 883 540 974 1340	260 370 370 338 338 280 260 240 210 210 160 540 120 120 200	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500 726	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.17 0.09 0.12 0.05 0.12 0.11	Rn 0.29 0.34 0.42 1,40 0.63 0.77 0.69 0.88 0.61 0.72 0.60 0.67 1,26 0.69 0.48 1,11 0.61
Basin Saran 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B	S tapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70	Er 0.58 0.29 0.60 0.65 0.94 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42 0.72 0.75	0,43 0,22 0,37 2,56 1,34 0,30 0,28 1,03 0,15 0,34 0,25 1,00 0,40 0,41 1,65 0,14 0,42	974 562 976 1340 1020 940 894 760 700 660 886 886 883 540 974 1340	260 370 370 338 338 280 260 240 210 160 540 120 120 200 160	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.17 0.09 0.12 0.05 0.12 0.11	Rn 0.29 0.34 0.42 1,40 0.63 0.77 0.69 0.88 0.61 0.72 0.60 0.67 1,26 0.69 0.48 1,11 0.61
Basin Saran 1 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B C D	S tapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70 1.42 1.04	Er 0.58 0.29 0.60 0.65 0.94 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42 0.72 0.75	0,43 0,22 0,37 2,56 1,34 0,30 0,28 1,03 0,15 0,34 0,25 1,00 0,40 0,41 1,65 0,14 0,42	H, m 974 562 976 1340 1020 940 894 760 700 660 886 886 883 540 974 1340 700 686	260 370 370 338 338 280 260 240 210 160 540 120 120 200 160	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500 726	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.17 0.09 0.12 0.05 0.12 0.11	Rn 0.29 0.34 0.42 1,40 0.63 0.77 0.69 0.88 0.61 0.72 0.60 0.67 1,26 0.69 0.48 1,11 0.61
Basin Saran 1 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B C D Sa	S tapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70 1.42 1.04	Er 0.58 0.29 0.60 0.65 0.94 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42 0.72 0.75	0.43 0.22 0.37 2.56 1.34 0.30 0.28 1.03 0.15 0.34 0.25 1.00 0.40 0.41 0.47 0.42 0.42	H, m 974 562 976 1340 1020 940 894 760 700 660 886 886 883 540 974 1340 700 686	260 370 370 338 338 280 260 240 210 160 540 120 120 200 160	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500 726	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.13 0.17 0.09 0.05 0.12 0.05 0.05 0.05 0.05 0.05	Rn 0.29 0.34 0.42 1,40 0.63 0.77 0.69 0.88 0.61 0.72 0.60 0.67 1,26 0.69 0.48 1,11 0.61
Basin Sarani 1 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B C D Sa Katsin	S tapotamo 6.13 1,15 1,79 1,89 3,56 3,92 2,22 0,97 2,21 1,75 1,70 1,34 1,34 3,18 3,72 2,70 1,42 1,04	Er 0.58 0.29 0.60 0.65 0.94 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42 0.75 0.61	0.43 0.22 0.37 2.58 1.34 0.30 0.28 1.03 0.15 0.34 0.25 1.00 0.40 0.41 0.47 0.42 0.42	H, m 974 562 976 1340 1020 940 894 760 700 660 886 886 883 540 974 1340 700 686	260 370 370 338 338 280 260 240 210 210 160 540 120 120 200 160	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500 726	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.13 0.17 0.09 0.05 0.05 0.05 0.05 0.05 0.05 0.05	Rn 0.29 0.34 0,42 1,40 0,63 0,77 0,69 0,67 1,26 0,69 0,48 1,11 0,61 0,75 0,80 0,67 1,26 0,69 0,48
Basin Saran 1 1 2 3 4 4 5 6 7 8 9 10 11 12 13 14 A B C C D Sa Katsin 1a	S tapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70 1.42 1.04	Er 0.58 0.29 0.60 0.95 0.94 0.49 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42 0.75 0.64	0.43 0.22 0.37 2.58 1.34 0.30 0.28 1.03 0.15 0.34 0.25 1.00 0.40 0.41 0.47 0.42 0.85	H, m 974 562 976 1340 1020 940 894 760 700 660 886 886 883 540 974 1340 700 686 1020	260 370 370 338 338 280 260 240 210 160 540 120 120 200 160 0	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 11140 500 726 1020	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.17 0.09 0.12 0.05 0.12 0.05 0.11 0.03	Rn 0.29 0.34 0.42 1,40 0,63 0,77 0,69 0.88 0,61 1,26 0,69 0,48 1,11 0,61 0,75 0,80 0,87 0,75 0,80
Basin Saran 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B C C D Sa Katsin 1a 2a	S tapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70 1.42 1.04 3.11	Er 0.58 0.29 0.60 0.94 0.49 0.46 0.87 0.51 0.65 0.66 0.90 0.53 0.42 0.72 0.75 0.61	0.43 0.22 0.37 2.58 1.34 0.30 0.28 1.03 0.15 1.00 0.47 1.65 0.14 0.42 0.85	H, m 974 562 976 1340 1020 940 894 760 700 660 886 883 540 974 1340 700 686 1020	260 370 370 338 338 280 260 240 210 160 540 120 200 200 160 0	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500 726 1020	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.17 0.09 0.05 0.12 0.05 0.11 0.03	Rn 0.29 0.34 0.42 1,40 0,63 0,77 0,69 0.88 0,61 1,26 0,69 0,48 1,11 0,61 0,75 0,80 0,87 0,75 0,80
Basin Saran 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B C C D Sa Katsin 1a 2a 3a	S tapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70 1.42 1.04 3.11	Er 0.58 0.29 0.60 0.94 0.49 0.46 0.87 0.51 0.65 0.66 0.90 0.63 0.42 0.72 0.75 0.61	0,43 0,22 0,37 2,58 1,34 0,30 0,28 1,03 0,15 1,00 0,40 0,11 0,47 1,65 0,14 0,42 0,85 0,29 0,48 0,29 0,49 0,29 0,49 0,29 0,49 0,49 0,29 0,49 0,29 0,49 0,49 0,49 0,49 0,49 0,49 0,49 0,4	H, m 974 562 976 1340 1020 940 894 760 700 660 886 883 540 974 1340 700 686 1020	260 370 370 338 338 280 260 240 210 160 540 120 200 160 0	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500 726 1020	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.17 0.09 0.05 0.12 0.05 0.13 0.01 0.03	Rn 0.29 0.34 0.42 1,40 0,63 0,77 0,69 0,88 0,61 1,11 0,61 0,75 0,80 0,80 0,67 0,69 0,48 1,11 0,61 0,75 0,80 0,63
Basin Saran 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A 8 C D Sa Katsin 1a 2a 3a 4a	S tapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70 1.42 1.04 3.11 mds 1.46 2.28 2.19 2.00	0.58 0.29 0.60 0.94 0.49 0.46 0.87 0.51 0.65 0.63 0.42 0.56 0.64 0.72 0.75 0.61	0,43 0,22 0,37 2,56 1,34 0,25 1,03 0,15 0,25 1,00 0,40 0,11 0,47 1,65 0,14 0,42 0,85 0,47 0,29 0,48 0,29 0,48 0,29 0,48 0,29 0,48 0,29 0,48 0,29 0,48 0,29 0,48 0,49 0,29 0,49 0,49 0,49 0,49 0,49 0,49 0,49 0,4	H, m 974 562 976 1340 1020 940 894 760 700 660 886 886 883 540 974 1340 700 686 1020	260 370 370 338 338 280 260 240 210 160 540 120 200 200 160 0	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500 726 1020	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.17 0.09 0.12 0.05 0.12 0.05 0.13 0.01 0.00	Rn 0.29 0.34 0.42 1,40 0.63 0.77 0.69 0.88 0.61 0.72 0.60 0.67 1.26 0.69 0.48 1.11 0.61 0.75 0.80
Basin Saran 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B C D Sa Katsin 1 2 2 8 3 8 4 8 5 8	S tapotamo 6.13 1,15 1,79 1,89 3,56 3,92 2,22 0,97 2,21 1,75 1,70 1,34 1,34 3,18 3,72 2,70 1,42 1,04 3,11 midi 1,46 2,28 2,19 2,00 3,38	Er 5 0.58 0.29 0.60 0.95 0.94 0.46 0.87 0.51 0.65 0.68 0.90 0.63 0.42 0.56 0.61 0.65 0.61 0.65 0.65	0,43 0,22 0,37 2,56 1,34 0,25 1,03 0,15 0,25 1,00 0,40 0,11 0,47 1,65 0,14 0,42 0,85 0,47 0,29 0,48 0,29 0,48 0,29 0,48 0,29 0,48 0,29 0,48 0,29 0,48 0,29 0,48 0,49 0,29 0,49 0,49 0,49 0,49 0,49 0,49 0,49 0,4	H, m 974 562 976 1340 1020 940 894 760 700 660 886 883 540 974 1340 700 686 1020	260 370 370 338 338 280 260 240 210 210 540 540 120 200 160 0	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 348 343 420 854 1140 500 726 1020 228 682 642 400 481	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.17 0.09 0.12 0.05 0.12 0.01 0.05 0.13 0.07 0.09 0.10 0.05 0.10 0.05	Rn 0.29 0.34 0.42 1,40 0.63 0.77 0.69 0.60 0.67 1.26 0.69 0.48 1.11 0.61 0.75 0.80 0.67 0.80
Basin Saran 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B C D Sa Katsin 1 2 2 8 3 8 4 8 5 8 A A	S tapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70 1.42 1.04 3.11 nidi 1.46 2.28 2.19 2.00 3.38 2.84	Er 5 0.58 0.29 0.60 0.95 0.94 0.46 0.87 0.51 0.65 0.68 0.90 0.63 0.42 0.56 0.61 0.65 0.61 0.65 0.65	0,43 0,22 0,37 2,56 1,34 0,28 1,03 0,15 0,25 1,00 0,40 0,11 0,47 1,65 0,14 0,42 0,85 0,49 0,29 0,40 0,40 0,11 0,47 0,28 0,47 0,29 0,40 0,40 0,40 0,40 0,40 0,40 0,40 0,4	H, m 974 562 976 1340 1020 940 894 760 700 660 886 883 540 974 1340 700 686 1020	Conf. 300, 260 370 338 338 280 260 240 210 160 540 120 200 160 0 160 0 160 338 70 80	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500 726 1020 228 682 642 400 481 760	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.17 0.09 0.12 0.05 0.12 0.01 0.05 0.13 0.07 0.09 0.10 0.05 0.10 0.05	Rn 0.29 0.34 0.42 1,40 0.63 0.77 0.69 0.60 0.67 1,26 0.69 0.48 1,11 0.61 0.75 0.80 0.67 0.74 0.65 0.74 0.65
Basin Saran 1 2 3 4 5 6 7 8 9 10 11 12 13 14 A B C D Sa Katsin 1 2 2 8 3 8 4 8 5 8 A A	S tapotamo 6.13 1.15 1.79 1.89 3.56 3.92 2.22 0.97 2.21 1.75 1.70 1.34 1.34 3.18 3.72 2.70 1.42 1.04 3.11 nidi 1.46 2.28 2.19 2.00 3.38 2.84	Er 0.58 0.29 0.60 0.65 0.94 0.46 0.87 0.51 0.65 0.66 0.90 0.53 0.42 0.56 0.61 0.65 0.61 0.65 0.61 0.72 0.75	0,43 0,22 0,37 2,56 1,34 0,28 1,03 0,15 0,25 1,00 0,40 0,11 0,47 1,65 0,14 0,42 0,85 0,47 0,29 0,40 0,20 0,40 0,40 0,40 0,40 0,40 0,40	H, m 974 562 976 1340 1020 940 894 760 700 660 886 883 540 974 1340 700 686 1020 388 842 842 842 842 842	Conf. 300, 260 370 338 338 280 260 240 210 160 540 120 200 160 0 160 0 160 338 70 80	H(tot.) 674 302 606 1002 682 660 634 520 490 450 726 346 343 420 854 1140 500 726 1020 228 682 642 400 481 760	Rh 0.06 0.05 0.12 0.09 0.14 0.13 0.11 0.09 0.18 0.17 0.09 0.12 0.05 0.13 0.01 0.05 0.13 0.05 0.13	Rn 0.29 0.34 0.42 1,40 0.63 0.77 0.69 0.60 0.67 1,26 0.69 0.48 1,11 0.61 0.75 0.80 0.67 0.74 0.65 0.74 0.65

The mean annual height of precipitation is 374,5mm and the mean annual temperature is 18,3°C

TABLE III: Characteristics of the hydrographical basins and their

concentration time RAINFALL UNIFORMITY COEFFICIENT CONCENTRATION TIME BASIN HOURS MINUTES FRUHLING FANTONI SPECHT NAME E1 0,29 0,72 0,54 0,67 0.42 E2 5,18 311 0.14 E3 3,72 223 0,25 0,71 0,51 0,08 E4 5.86 352 0.64 0.32 E5 6,07 364 0.08 0,63 0,31 E6 2,79 168 0.49 0.77 0.62 E7 2,71 163 0,51 0,78 0,63 4,05 0,52 E8 243 0,27 0.71

Table VII. Maximum 24 hour runoff (Q)

Table VII. IVIAXIMUM 24 Hour runoff (Q).									
	Maximum p	probable 24	Maximum pro						
Drainage	ho	ur	runoff (Q): m ³ /24 hour						
	runoff (Q) in mm							
basin	normal	wet	normal	wet					
name	conditions	conditions	conditions	conditions					
E1	28.1	67,0	1430302.9	3407725.0					
E2	38.8	77.5	4849764,8	9693638,5					
E3	10.8	45.2	692154,1	2896963,8					
E4	25.1	63,7	5824509.1	14788890.2					
E5	27.4	66.2	6926585,9	16738294.3					
E6	16.8	53.8	372596,9	1190041,7					
E7	3.6	31.9	73144,1	647889,9					
E8	17.0	54.0	979294.9	3109642,3					

Table VIII Correlation between the height and intensity of rainfall and the duration of rainfall, using the curve H = Hhour +140.333

Rainfail duration in hours Rainfail duration in min Rainfail height in mm Rainfail intensity in mm/hour 0.1 6 22.440 224.403 0.15 9 25.684 171,228 0.2 12 28.266 141,332 0.25 15 30,447 121,788 0.3 18 32,353 107,842 0.4 24 35,605 89,013 0.5 30 38,352 76,704 0.6 36 40,752 67,921 0.7 42 42,899 61,284 0.8 48 44,850 56,062 0.9 54 46,644 51,826 1 60 48,309 48,309 1.5 90 55,293 36,862 2 120 60,852 30,426 2.5 150 65,546 26,218 3 180 69,648 23,216 4 240 76,650 19,163			he duration of rainfall, using thour x t ^0,333.					
hours min mm mm/hour 0.1 6 22.440 224,403 0.15 9 25,684 171,228 0.2 12 28,266 141,332 0.25 15 30,447 121,788 0.3 18 32,353 107,842 0.4 24 35,605 89,013 0,5 30 38,352 76,704 0,6 36 40,752 67,921 0,7 42 42,899 61,284 0,8 48 44,850 56,062 0,9 54 46,644 51,826 1 60 48,309 48,309 1,5 90 55,293 36,862 2 120 60,852 30,426 2.5 150 65,546 26,218 3 180 69,648 23,216 4 240 76,650 19,163 5 300 82,563 16,513				Rainfall				
0.1 6 22.440 224,403 0.15 9 25,684 171,228 0.2 12 28,266 141,332 0.25 15 30,447 121,788 0.3 18 32,353 107,842 0.4 24 35,605 89,013 0,5 30 38,352 76,704 0,6 36 40,752 67,921 0,7 42 42,899 61,284 0,8 48 44,850 56,062 0,9 54 46,644 51,826 1 60 48,309 48,309 1,5 90 55,293 36,862 2 120 60,852 30,426 2.5 150 65,546 26,218 3 180 69,648 23,216 4 240 76,650 19,163 5 300 82,563 16,513 6 360 87,731 14,622	duration in	duration in	height in	intensity in				
0.15 9 25.684 171,228 0.2 12 28.266 141,332 0.25 15 30,447 121,788 0.3 18 32,353 107,842 0.4 24 35,605 89,013 0.5 30 38,352 76,704 0.6 36 40,752 67,921 0.7 42 42,899 61,284 0.8 48 44,850 56,062 0.9 54 46,644 51,826 1 60 48,309 48,309 1.5 90 55,293 36,862 2 120 60,852 30,426 2.5 150 65,546 26,218 3 180 69,648 23,216 4 240 76,650 19,163 5 300 82,563 16,513 6 360 87,731 14,622 7 420 92,352 13,193	hours	min	mma	mm/hour				
0.2 12 28,266 141,332 0.25 15 30,447 121,788 0.3 18 32,353 107,842 0.4 24 35,605 89,013 0.5 30 38,352 76,704 0.6 36 40,752 67,921 0.7 42 42,899 61,284 0.8 48 44,850 56,062 0.9 54 46,644 51,826 1 60 48,309 48,309 1,5 90 55,293 36,862 2 120 60,852 30,426 2.5 150 65,546 26,218 3 180 69,648 23,216 4 240 76,650 19,163 5 300 82,563 16,513 6 360 87,731 14,622 7 420 92,352 13,193 8 480 96,551 12,069 </td <td></td> <td>6</td> <td>22.440</td> <td>224,403</td>		6	22.440	224,403				
0.25 15 30,447 121,788 0.3 18 32,353 107,842 0.4 24 35,605 89,013 0.5 30 38,352 76,704 0.6 36 40,752 67,921 0.7 42 42,899 61,284 0.8 48 44,850 56,062 0.9 54 46,644 51,826 1 60 48,309 48,309 1.5 90 55,293 36,862 2 120 60,852 30,426 2.5 150 65,546 26,218 3 180 69,648 23,216 4 240 76,650 19,163 5 300 82,563 16,513 6 360 87,731 14,622 7 420 92,352 13,193 8 480 96,551 12,069 9 540 100,413 11,157 <td></td> <td></td> <td>25.684</td> <td>171,228</td>			25.684	171,228				
0.3 18 32.353 107,842 0.4 24 35,605 89,013 0.5 30 38.352 76,704 0.6 36 40,752 67,921 0.7 42 42,899 61,284 0.8 48 44,850 56,062 0.9 54 46,644 51,826 1 60 48,309 48,309 1,5 90 55,293 36,862 2 120 60,852 30,426 2.5 150 65,546 26,218 3 180 69,648 23,216 4 240 76,650 19,163 5 300 82,563 16,513 6 360 87,731 14,622 7 420 92,352 13,193 8 480 96,551 12,069 9 540 100,413 11,157 10 600 103,999 10,400 <td>0.2</td> <td></td> <td>28.266</td> <td>141,332</td>	0.2		28.266	141,332				
0,4 24 35,605 89,013 0,5 30 38,352 76,704 0,6 36 40,752 67,921 0,7 42 42,899 61,284 0,8 48 44,850 56,062 0,9 54 46,644 51,826 1 60 48,309 48,309 1,5 90 55,293 36,862 2 120 60,852 30,426 2,5 150 65,546 26,218 3 180 69,648 23,216 4 240 76,650 19,163 5 300 82,563 16,513 6 360 87,731 14,622 7 420 92,352 13,193 8 480 96,551 12,069 9 540 100,413 11,157 10 600 103,999 10,400 12 720 110,509 9,209	0.25	15	30,447	121,788				
0.5 30 38.352 76.704 0.6 36 40.752 67.921 0.7 42 42.899 61.284 0.8 48 44.850 56.062 0.9 54 46.644 51.826 1 60 48.309 48.309 1.5 90 55.293 36.862 2 120 60.852 30.426 2.5 150 65.546 26.218 3 180 69.648 23.216 4 240 76.650 19.163 5 300 82.563 16.513 6 360 87.731 14.622 7 420 92.352 13.193 8 480 96.551 12.069 9 540 100.413 11.157 10 600 103.999 10.400 12 720 110.509 9.209 15 900 119.033 7.936	0.3	18	32,353	107,842				
0.6 36 40.752 67.921 0.7 42 42.899 61.284 0.8 48 44.850 56.062 0.9 54 46.644 51.826 1 60 48.309 48.309 1.5 90 55.293 36.862 2 120 60.852 30.426 2.5 150 65.546 26.218 3 180 69.648 23.216 4 240 76.650 19.163 5 300 82.563 16.513 6 360 87.731 14.622 7 420 92.352 13.193 8 480 96.551 12.069 9 540 100.413 11.157 10 600 103.999 10.400 12 720 110.509 9.209 15 900 119.033 7.936 20 1200 131.000 6.550 <td>0.4</td> <td>24</td> <td>35,605</td> <td>89,013</td>	0.4	24	35,605	89,013				
0.7 42 42.899 61.284 0.8 48 44.850 56.062 0.9 54 46.644 51.826 1 60 48.309 48.309 1.5 90 55.293 36.862 2 120 60.852 30.426 2.5 150 65.546 26.218 3 180 69.648 23.216 4 240 76.650 19.163 5 300 82.563 16.513 6 360 87.731 14.622 7 420 92.352 13.193 8 480 96.551 12.069 9 540 100.413 11.157 10 600 103.999 10.400 12 720 110.509 9.209 15 900 119.033 7.936 20 1200 131.000 6.550 24 1440 139.200 5.800 <td>0,5</td> <td>30</td> <td>38.352</td> <td>76,704</td>	0,5	30	38.352	76,704				
0.8 48 44.850 56.062 0.9 54 46.644 51.826 1 60 48.309 48.309 1.5 90 55.293 36.862 2 120 60.852 30.426 2.5 150 65.546 26.218 3 180 69.648 23.216 4 240 76.650 19.163 5 300 82.563 16.513 6 360 87.731 14.622 7 420 92.352 13.193 8 480 96.551 12.069 9 540 100.413 11.157 10 600 103.999 10.400 12 720 110,509 9.209 15 900 119,033 7.936 20 1200 131,000 6.550 24 1440 139.200 5.800 30 1800 149,938 4.998	0.6	36	40,752	67,921				
0.9 54 46.644 51.826 1 60 48.309 48.309 1.5 90 55.293 36.862 2 120 60.852 30.426 2.5 150 65.546 26.218 3 180 69.648 23.216 4 240 76.650 19.163 5 300 82.563 16.513 6 360 87.731 14.622 7 420 92.352 13.193 8 480 96.551 12.069 9 540 100.413 11.157 10 600 103.999 10.400 12 720 110,509 9.209 15 900 119,033 7.936 20 1200 131,000 6.550 24 1440 139,200 5,800 30 1800 149,938 4,998	0.7	42	42.899	61,284				
1 60 48.309 48.309 1,5 90 55.293 36.862 2 120 60.852 30.426 2,5 150 65.546 26.218 3 180 69.648 23.216 4 240 76.650 19.163 5 300 82.563 16.513 6 360 87.731 14.622 7 420 92.352 13.193 8 480 96.551 12.069 9 540 100.413 11.157 10 600 103.999 10.400 12 720 110,509 9.209 15 900 119,033 7.936 20 1200 131,000 6.550 24 1440 139,200 5,800 30 1800 149,938 4.998	0.8	48	44.850	56,062				
1,5 90 55,293 36,862 2 120 60,852 30,426 2,5 150 65,546 26,218 3 180 69,648 23,216 4 240 76,650 19,163 5 300 82,563 16,513 6 360 87,731 14,622 7 420 92,352 13,193 8 480 96,551 12,069 9 540 100,413 11,157 10 600 103,999 10,400 12 720 110,509 9,209 15 900 119,033 7,936 20 1200 131,000 6,550 24 1440 139,200 5,800 30 1800 149,938 4,998	0.9	54	46,644	51.826				
2 120 60,852 30,426 2 5 150 65,546 26,218 3 180 69,648 23,216 4 240 76,650 19,163 5 300 82,563 16,513 6 360 87,731 14,622 7 420 92,352 13,193 8 480 96,551 12,069 9 540 100,413 11,157 10 600 103,999 10,400 12 720 110,509 9,209 15 900 119,033 7,936 20 1200 131,000 6,550 24 1440 139,200 5,800 30 1800 149,938 4,998		60	48.309	48,309				
25 150 65,546 26 218 3 180 69,648 23,216 4 240 76,650 19,163 5 300 82,563 16,513 6 360 87,731 14,622 7 420 92,352 13,193 8 480 96,551 12,069 9 540 100,413 11,157 10 600 103,999 10,400 12 720 110,509 9,209 15 900 119,033 7,936 20 1200 131,000 6,550 24 1440 139,200 5,800 30 1800 149,938 4,998		90	55,293	36,862				
3 180 69,648 23,216 4 240 76,650 19,163 5 300 82,563 16,513 6 360 87,731 14,622 7 420 92,352 13,193 8 480 96,551 12,069 9 540 100,413 11,157 10 600 103,999 10,400 12 720 110,509 9,209 15 900 119,033 7,936 20 1200 131,000 6,550 24 1440 139,200 5,800 30 1800 149,938 4,998		120	60,852	30,426				
4 240 76,650 19,163 5 300 82,563 16,513 6 360 87,731 14,622 7 420 92,352 13,193 8 480 96,551 12,069 9 540 100,413 11,157 10 600 103,999 10,400 12 720 110,509 9,209 15 900 119,033 7,936 20 1200 131,000 6,550 24 1440 139,200 5,800 30 1800 149,938 4,998	2.5	150	65,546	26.218				
5 300 82.563 16.513 6 360 87.731 14.622 7 420 92.352 13.193 8 480 96.551 12.069 9 540 100.413 11.157 10 600 103.999 10.400 12 720 110.509 9.209 15 900 119.033 7.936 20 1200 131.000 6.550 24 1440 139.200 5.800 30 1800 149.938 4.998	3	180	69,648	23.216				
6 360 87.731 14.622 7 420 92.352 13.193 8 480 96.551 12.069 9 540 100.413 11.157 10 600 103.999 10.400 12 720 110,509 9.209 15 900 119,033 7.936 20 1200 131,000 6.550 24 1440 139,200 5,800 30 1800 149,938 4.998	4	240	76,650	19.163				
7 420 92.352 13.193 8 480 96.551 12.069 9 540 100.413 11.157 10 600 103.999 10.400 12 720 110,509 9.209 15 900 119.033 7.936 20 1200 131.000 6.550 24 1440 139.200 5.800 30 1800 149,938 4.998	5	300	82,563	16.513				
8 480 96.551 12.069 9 540 100.413 11.157 10 600 103.999 10.400 12 720 110,509 9.209 15 900 119.033 7.936 20 1200 131.000 6.550 24 1440 139.200 5.800 30 1800 149,938 4.998		360	87,731	14,622				
9 540 100.413 11.157 10 600 103.999 10.400 12 720 110,509 9.209 15 900 119,033 7,936 20 1200 131,000 6.550 24 1440 139,200 5,800 30 1800 149,938 4,998	7	420	92.352	13.193				
10 600 103,999 10,400 12 720 110,509 9,209 15 900 119,033 7,936 20 1200 131,000 6,550 24 1440 139,200 5,800 30 1800 149,938 4,998	8	480	96.551	12.069				
12 720 110,509 9,209 15 900 119,033 7,936 20 1200 131,000 6,550 24 1440 139,200 5,800 30 1800 149,938 4,998	9	540	100.413	11,157				
15 900 119,033 7,936 20 1200 131,000 6,550 24 1440 139,200 5,800 30 1800 149,938 4,998		600	103,999	10.400				
20 1200 131,000 6,550 24 1440 139,200 5,800 30 1800 149,938 4,998	12	720	110,509	9,209				
24 1440 139,200 5,800 30 1800 149,938 4,998	15	900	119,033	7,936				
30 1800 149,938 4.998	20	1200	131,000	6,550				
	24	1440	139,200	5,800				
40 2400 165.012 4.125	30	1800	149,938	4.998				
	40	2400	165.012	4.125				

according to the measurements of the Meteorological Station of Elefsina for the observation time-period 1958 - 1992.

Table IX

	I CI	NC IV
Drainage	Basin	Rainfall intensity (i) with a
basin	concentration	duration equal to the basin
name	Time (Tc)	concentration time
	in min	in mm/hour
E1	178	23,4
E2	311	16,12
. E3	223	20,1
E4	352	14,85
E5	364	14,51
E6	168	24,36
E7	163	24,84
E8	243	19,01

Based on the maximum 24 hour rainfalls we estimated, according to Gumbel analysis, the expected rainfall height for a recurrence period of 25, 50 and 100 years, as below.

62,2	< 25 <	113,0
69,4	< 50 <	121,1
76,6	< 100 <	139,2

Calculations

In order to calculate the runoff curve number or the specific runoff coefficient (CN) for every elementary homogeneous part of soil area of Sarantapotamos of the

Calculation of maximum 24 hour runoff (Q)

The runoff curves of wet and dry periods were calculated by the known equations as the S.C.S. method proposes.

The maximum 24 hour runoff (Q) are calculated and the final results are presented in table VII. The results are based on the maximum 24 hour rainfall which resulted by the rainfall analysis according to Gumbel, with recurrence period 100 years both in wet and dry soil conditions before the rainfall.

Calculation of the maximum peak storm runoff (Qp)

In order to estimate the maximum peak storm runoff of the 8 drainage basins of Sarantapotamos and Katsimidi streams, it is necessary to know the mean rainfall intensity (i) of duration equal to the total basin concentration time Tc of each basin which is defined as the maximum rainfall height that happened at time Tc in the basin, with recurrence period of 25, 50 or even 100 years.

In order to calculate the rainfall height - rainfall duration and rainfall intensity (i) - rainfall duration curves, we used the maximum 24 hour rainfall according to Gumbel analysis, for various recurrence periods. We accepted height-duration curves according to Montana:

$$H = a \cdot t^b$$

for t = 1 hour it is Hhour = a and

(1) H = Hhour.t^b

where:

H=height of a rainfall duration in time t

b =usually 0,333 up to 0,50

Equivalent:

Curves (1) and (2) are straight lines in logarithmic scale.

The rainfall height - rainfall duration and rainfall intensity (i) - rainfall duration curves according to 24 hour rainfall resulted by Gumbel method for rainfalls that took

TABL	E XI: Runoll e	model o	4 maximum 2	4 hour r	TABLE XI: Runoff model of maximum 24 hour rainfall and peak storm runoff	storm runo	=														
		-													ŕ	MAXIMUM 24	MAXIMUM 24 MAXIMUM 24 MAXIMUM 24	MAXIMUM 24	MAXIMUM 24	MAXIMUM	MAXIMUM
		_										-				HOUR HOUR	HOURS	HOURS	HOURS	PROBABLE	PROBABLE
		_					MEAN RUNOFF CURVE	OFF CURV	w w	4	5.20:4	_	P-la (with	(with P at 100 years)	ears)	RUNOFF	RUMOFF	RUNOFF	RUMOFF	PEAK STORM	PEAK STORM
		_					NOMBE	NOMBER (CN) *					,			ĝ	ĝ	ĝ	ĝ	RUNOFF	RUIJOFF
	_	-										_				(mm)	(fm3)	(mm)	(m3)	(d0)	(dD)
BASIN	_	_	MAXIMUN	•	_	CONCENT	-			-			-			Normal	Normal	Wet	Wet conditions	Normal	Wet conditions
Ž	_	# :	24			RATION			2		_	_	_	_	-	conditions	conditions	conditions	with restoration	conditions with	with restoration
	(mm)	1	RAINFALL		RATION TIME	(min)	COND	Corp	S COND	COND	COND	500	COND	COND	S C C	restoration	vestoration	with	period 100 years	seriod 100 veers	period 100 years
			(P) (mm)		(Tc) (mm)						_	_	_	_		period 100	period 100	period 100			
		2	25 50 Years 100	9	100 Years											į					
		Ye	Years	Years								_		_	_						
Ę	Н	П	113 121,1	139.2	69,38	178	53	73	33	44.68	19.08	16101	94.52	120 12	37.29	28.10	1430302 87	96 99	3407724 96	175.99	240.47
E2	Н	-	13 121,1	139,2	83,55	311	59	11	39	35,10	-	90.08	-	124.21	59.14	38.76	4849764.81	77.47	9693638.52	331.39	432 70
£3			13 121,1	139,2		223	42	62	24	Н	30,50	162,94	67,77	108.70	-23.74	10.81	692154.13	45,23	2896963.79	148,59	223.40
Ē	+		13 121.1	139,2	87,06	352	51	7.1	32	Н	20.52	109,60	91,15	118,68	29,60	25.07	5824509.05	63,66	14788890.22	492.46	682,58
65		٥	13 121,1	139,2	88,08	364	53	72	33	45,44	19.40	103.64	93,76	119.80	35,56	27.39	6926585.91	66.20	16738294.29	537.87	737.35
E6	374.5	٦	13 121,1	139,2	68,00	168	46	67	27	59.51	25.41	135,75	79.69	113.79	3.45	16.83	372596.93	53.76	119004171	68.97	99.83
E7			113 121,1	139.2	67,33	163	35	55	19	95,83	40.92	218,58	43.37	98.28	.79.38	360	73144.14	31.89	647889.93	48.57	77.65
E8	374,5	П	113 121,1	139,2		243	46	67	22	Н	25,30	135,12		-	4.08	17.00	979294.92	53.97	3109642.35	140.45	203 10

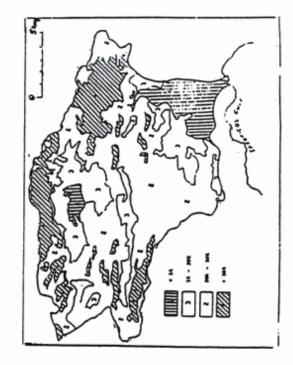


Fig.5.Map of inclination.

TABLE XIV. Sediment yield estimation of the hydrographic basins.

_		_	_	_	_	_	_	_	_	_	_	_	_	_	_
1	Volume of	mean annual	sediment	yield of the	pasin	(m3/Year)		320,1	1032.3	374.5	1642.3	2014.8	181.7	63,5	470.9
	Weight of	mean annual	sediment yield	of the basin		(lon/Year)		800,2	2580,8	936,3	4105.9	5037.1	454.2	158.7	1177.2
	Mean relative	density of	peologic	formations		3		2,50	2,50	2,50	2.50	2.50	2.50	2.50	2.50
-			rainfall	height	,	(m)		0.3745	0.3745	0.3745	0.3745	0.3745	0.3745	0,3745	0.3745
	Basin	geological	coefficient	8		3		0.341	0,447	0.317	0,383	0,432	0,445	0,169	0.443
one of the party	Low erosivity	geological	formations			(K3) AREA	(m2)	32472477	60182531	48610053	140780530	141180530	13658723	18750331	35662672
	Moderale	erosivity	geological	formations		(K2) AREA	(m2)	8652541	30028706		33220488	33220488			
Trend to drift into	High erosivify	geological	formations			(K1) AREA	(m2)	9772282	34908370	15434812	58310087	78455136	8478592	1564221	21950692
						BASIN AREA	(m2)	50897300	125119607	64044865	232311105	252856154	22137315	20314552	57613364
						BASIN	NAME	E1	E2	E3	E4	ES	E6	E7	E8

Where:

G: mean annual sediment yield in (t/km²), p: mean annual rainfall height in (m), and, y: geological coefficient determined by the following equation:

$$y = (K_1 . p_1) + K_2 . p_2) + (K_3 . p_3) (4)$$

where:

 K_1 , K_2 , K_3 : erosivity coefficients, of the three main categories of rocks.

 p_1 , p_2 , p_3 : corresponding proportions of area in which every rock category appears, to the total area of the drainage basin. These result from geological mapping.

Various rock formations were classified in three main categories according to their erosivity. The area of each category in every basin is shown in Table XII.

Therefore the mean geological coefficient of each studied basin is calculated according to equation (4). This coefficient is included in the above Table XII.

According to the data of this paper it is given:

- The area of each drainage basin is shown in the final Table XIV.
- 2) The mean annual rainfall in the studied basins, which is equal to 374.5 mm or 0,3745 m.

Using equation (3) we calculated the mean annual sediment yield of each basin (Table XIII). The same Table includes sediment yield expressed in cubic meters per year. (For the calculation is accepted mean relative rock density, d=2,5).

Each data and parameter of sediment yield calculation for all studied drainage basins are shown in the final Table XIII.

Many times this sediment yield which has been estimated above, fills up the stream channels locally. As a results the draining capacity of these streams decreases and therefore there is a danger of extensive floods especially after strong rainfalls. That is the reason why the channels, especially in problem relevant to floods areas, should be maintained and regularly cleared and opened.

DISCUSSION - CONCLUSIONS

The drainage basins of Sarantapotamos and Katsimidi streams lie in western Attica. The number of the channels of the 3rd and 5th order basins of Sarantapotamos stream, is the theoritically expected, according to the first law of Horton (1945). In the 4th order basins, A and B, there is a reduction of 22% and 10% compared to the theoretically expected correspondingly, and the very short mean length of the branches that is observed are also caused by lithology. There is no deviation in the number and length of the streams of Katsimidi.

The bifurcation ratio (Rb) is between 2,2 and 5,8, showing well developed drainage network. The index S=L/W show the existance of very long basins, except that of Parnitha mt. The drainage density (D) is medium to very high. Basin B has the lower values of density as well as its 3rd order basins, due to karstification. The drainage frequency and density values are medium to high, influenced by lithology.

The study of the D1 and F1 values of the 3rd order basins showed that F1 values are clearly lower that the corresponding D1. This reveals an advanced maturity stage of development of the drainage systems.

The conservation values of the channels (C) are high. This shows the lithological effect and that the drainage systems belong to a mature stage of development.

The relief values (Rh) are high, showing high gradients of slopes, mainly of the basins of Parnitha mt.

The relief roughness (Rn) has high values and this is caused by lithology and the high gradients, because of the altitude of the watersheds.

The maximum 24 hour runoff (Q) of each basin was calculated and the final results were presented in table XI. The results are based on the maximum 24 hour rainfall which resulted by the rainfall analysis according to Gumbel, with recurrence period 100 years both in wet and dry soil conditions before the rainfall.

The rainfall height - rainfall duration and rainfall intensity (i)-rainfall duration curves according to 24 hour rainfall resulted by Gumbel method for rainfalls that took place in the area with recurrence period T of 100 years and the rainfall height - rainfall duration curve H=Hhour.t^{0,333} are given in table VIII.

The peak storm runoff of each basin was calculated according to the present land use/cover conditions and presented in Table XI. must mentioned that the calculated values of storm runoff refer to the extreme values of the maximum probable peak storm runoff that might ever happen in the area of the drainage basins of Sarantapotamos and Katsimidi streams in extreme circumstances and rarely. There should however been taken seriously into account in order to foresee and anticipate the flood levels of the torrents and streams, as well as for the planning of the sewage and draining work systems. Furthermore it must be mentioned that the channels of the streams of the area must be maintained and cleaned regularly from time to time.

The mean annual sediment yield of each one basin was calculated and shown in Table XIII. Each data and parameter of sediment yield calculation for all studied drainage basins are shown in the final Table XIV.

Occusionally, sediment yield fill up the stream channels locally and the draining capacity of the streams decreases resulting in extensive floods in the wider area, especially after strong rainfalls. Therefore, it is suggested that the channels, especially in problem relevant to floods areas, must be maintained and regularly cleared and opened.

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