

WHERE IS THE WATER RUNNING?

An analysis of the CPWF THEME 2 preliminary selected proposals

Summary

As part of the competitive funding call for the second phase of the Challenge Program on Water and Food, 97 concept notes were selected from a total of 342 for full development and to compete in the final selection. Thirty-nine of these 97 proposals addressed more than 20 per cent of the Theme 2 research agenda. In order to identify correlations, similarities and topic distribution between Theme 2 proposals, project managers were asked to individually assess their proposals by distributing 100 points among the 21 keywords describing the main topics or issues of the research agenda.

The objective of this questionnaire was to systematically understand the typology of projects that will help answer the questions posed by Theme 2 in its conceptual framework. Three methods were used to analyze the responses: Pearson correlation, tree Diagram Ward's method squared Euclidean distance, and a 3D graphic plot of proposals.

Though numbers and graphics can talk for themselves, a quick look at the results shows us that Theme 2 proposals lean towards social rather than biophysical issues. They also integrate several of the questionnaire's keywords while only a few links between the proposals are evident.

▪ Which were the answers?

A list of chosen keywords is presented in the first column of Table 1. Raw results of the survey are presented in Annex 1. As Table 1 shows, the focus is directed towards participatory research, learning processes, and gender and collective action topics. These areas received more points followed by the upstream-downstream interactions and land use-land cover topics. From these results it is also possible to conclude that relevant topics such as risk, vulnerability, generalization and climate change were not taken into account as initially expected. The analysis also offers some idea of possible research gaps within the Theme for special attention or focus.

Table 1 Weight distribution of topics

Topics	Mean	St. Deviation
Participatory research / learning process / gender / collective action	10.24	6.33
Upstream-downstream interactions	8.13	7.66
Land use land cover/ soil erosion / land degradation	7.75	6.88
Institutional Issues	6.84	5.70
Crop Water productivity	6.50	7.50
Rainfed agriculture drylands	5.94	8.22
Catchment's's Hydrology	5.90	6.07
Water conflict / social conflicts / water rights	5.32	5.63
Water Availability/allocation	5.03	5.08
Decision Support Systems	3.90	5.02
Risk and vulnerability	3.83	4.09
Irrigation	3.77	6.16
Environmental services / externalities / degradation	3.70	5.61
Impact assessment	3.68	3.99
Modeling	3.55	4.26
Scaling	3.48	4.26
Technology adaptation	3.45	4.68
Field monitoring	3.30	3.37
Generalization/extrapolation	2.81	4.63
Water quality	2.35	4.19
Climate change	0.68	1.58

Different Ways of Looking at the Results

The following methods were used to compare results and topics according to how points were distributed:

1. Pearson correlation with two variables association coefficient

This correlation measures the strength of the linear relationship between two variables. Pearson's Correlation Coefficient can take on values from -1.0 to 1.0. Where -1.0 is a perfect negative or inverse correlation, 0.0 is no correlation, and 1.0 is a perfect positive correlation. The results of this exercise are presented in Annex 2.

Coefficients higher than 0.50 indicate that two proposals are correlated according to the similar weight given to some topics. Table 2 presents a summary of these coefficients and the keywords or topics that relate to both proposals.

Table 2 Correlation coefficients higher than 0.50

Project Manger	Project Manager	Index	Correlated Keywords (similar weight)
Drechsel (26)	Masiyandima (40)	0.58	Upstream/downstream interactions, Environmental services/degradation, Impact Assessment
Masiyandima (40)	Merrey (44)	0.67	Catchment's hydrology, Upstream/downstream interactions
Masiyandima (40)	Moreno (132)	0.51	Environmental services, Upstream/downstream interactions
Merrey (44)	Kanninen (358)	0.56	Institutional issues, catchment's hydrology
Pandey (54)	Musvoto (318)	0.51	Crop water productivity, Participatory research, Institutional Issues, Upstream/downstream interactions
Sharda (88)	Salkini (319)	0.53	Lan use land cover, crop water productivity, Upstream/downstream interactions, technology adaptation
Srivastva (91)	Hatibu (200)	0.50	Risk and vulnerability, scaling, field monitoring, technology adaptation
Manase (105)	Moreno (132)	0.55	Environmental services, Upstream/downstream interactions
Jonker (133)	El-Monein (192)	0.55	Crop water productivity, Participatory research, rainfed agriculture drylands
Jonker (133)	Waddington (226)	0.53	Crop water productivity, Participatory research, rainfed agriculture drylands
Jonker (133)	Asante (269)	0.55	Crop water productivity, participatory research, rainfed agriculture drylands
Jonker (133)	Mgonja (274)	0.58	Participatory research, Institutional Issues, Catchment's hydrology
Jonker (133)	Musvoto (318)	0.79	Crop water productivity, Risk and vulnerability, Institutional issues, rainfed agriculture drylands, irrigation, technology adaptation
El-Monein (192)	Hatibu (200)	0.58	Crop water productivity, participatory research, rainfed agriculture drylands
El-Monein (192)	Waddington (226)	0.71	Crop water productivity, participatory research, rainfed agriculture drylands, technology adaptation
El-Monein (192)	Asante (269)	0.68	Land use land cover, crop water productivity, participatory research, technology adaptation, rainfed agriculture drylands
El-Monein (192)	Mgonja (274)	0.77	Participatory research, rainfed agriculture drylands, technology adaptation

Turkelboom (199)	Musvoto (318)	0.60	Risk and vulnerability, participatory research, rainfed agriculture drylands
Turkelboom (199)	Pant (237)	0.57	Land use land cover, Participatory research
Turkelboom (199)	Stroud (360)	0.50	Land use land cover, participatory research
Hatibu (200)	Waddington (226)	0.62	Crop water productivity, participatory research, Catchment's hydrology
Waddington (226)	Asante (269)	0.61	Participatory research, rainfed agriculture drylands, impact assessment
Waddington (226)	Mgonja (274)	0.64	Participatory research, rainfed agriculture drylands, impact assessment, technology adaptation
McVicar (245)	Asante (269)	0.52	Participatory research, rainfed agriculture drylands, technology adaptation
McVicar (245)	Kanninen (358)	0.52	Land use land cover, Catchment's hydrology
Bousquet (263)	Amede (313)	0.59	Water conflict / social conflicts, Catchment's hydrology, decision support systems
Bousquet (263)	Stroud (360)	0.75	Water conflict / social conflicts, Participatory research, decision support systems
Asante (269)	Mgonja (274)	0.55	Participatory research, rainfed agriculture drylands, impact assessment, technology adaptation
Asante (269)	Musvoto (318)	0.52	Crop water productivity, Participatory research, rainfed agriculture drylands
Asante (269)	Salkini (319)	0.63	Participatory research, rainfed agriculture drylands, water availability
Amede (313)	Noordwijk (346)	0.60	Water conflict / social conflict, Catchment's hydrology, Upstream/downstream interactions

2. Tree Diagram Ward's method squared Euclidean Distance

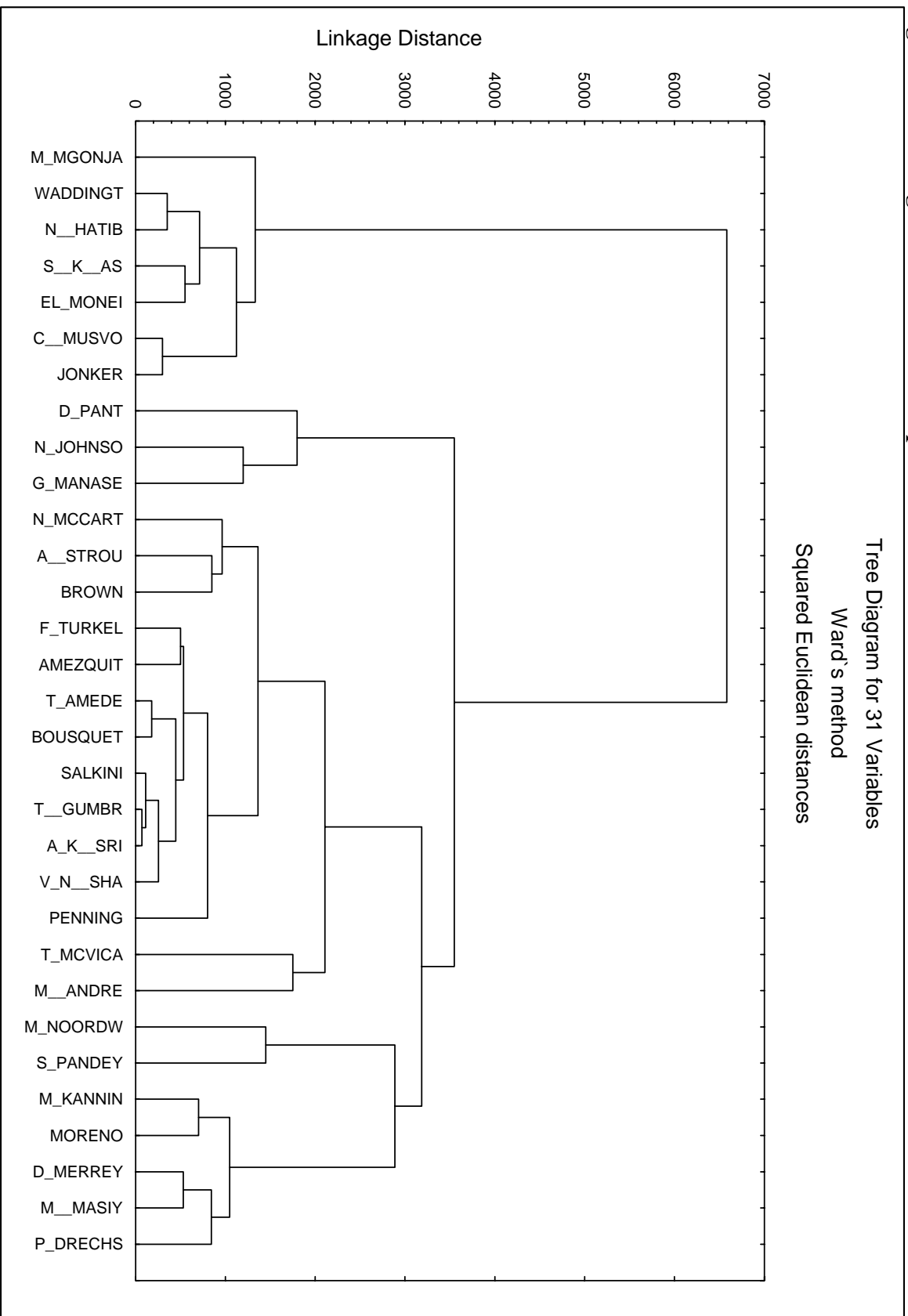
The tree diagram groups proposals into subsets or "clusters"; those within each cluster are more closely related to one another. Branches connect data points showing the order in which the clusters are formed and the distances between clusters. The length of the branches is proportional to the distance (Figure 1). Two groups were formed at the first level of clustering. The first was composed by Mgonja, Waddington, Hatib, K_As, Monei, Musvoto and Jonker (what we could call the biophysical side); the second group consists of the remaining proposals.

In the first group, project managers gave high value to water productivity, rain fed agriculture and dry lands. In the second group of proposals, however, the weight of importance was more

evenly distributed. If the groups are analyzed at the second order cut, three groups are formed: the first is equal to the one formed in the first cut; the second group, consisting of Pant, Johnson and Manase, gave the same value to participatory research, learning processes, and gender; and the third group consisted of the remaining proposals.

From this graph it is possible to conclude that most of the topics received points or were included in almost all of the proposals, covering a range of issues from biophysical to social ones.

Figure 1 Tree Diagram for Theme 2 Proposals



3. 3D Plot of Proposals

The 3D plot was based on the reclassification of the 21 topics into three main groupings, namely: biophysical, social and institutions and land use change (Table 4). Figure 2 shows the proposals according to the emphasis on biophysical characteristics (x axis), social aspects (y axis) and land use change (z axis).

Some observations:

- Social aspects figure more strongly than land use change and biophysical aspects
- Some proposals give very little attention to biophysical aspects (e.g. 138, 274)
- Some proposals inhabit similar space

A 3D plot can help spot potential complementarities on the basis of sharing strong interests. For example, 138 has strong social aspects but is weaker on specific land use change or the description of biophysical limitations. It could possibly link well with 292. Meanwhile, 132 is weaker on aspects of social organization and could use outputs from 138.

Figure 2 3D Plot of Proposals

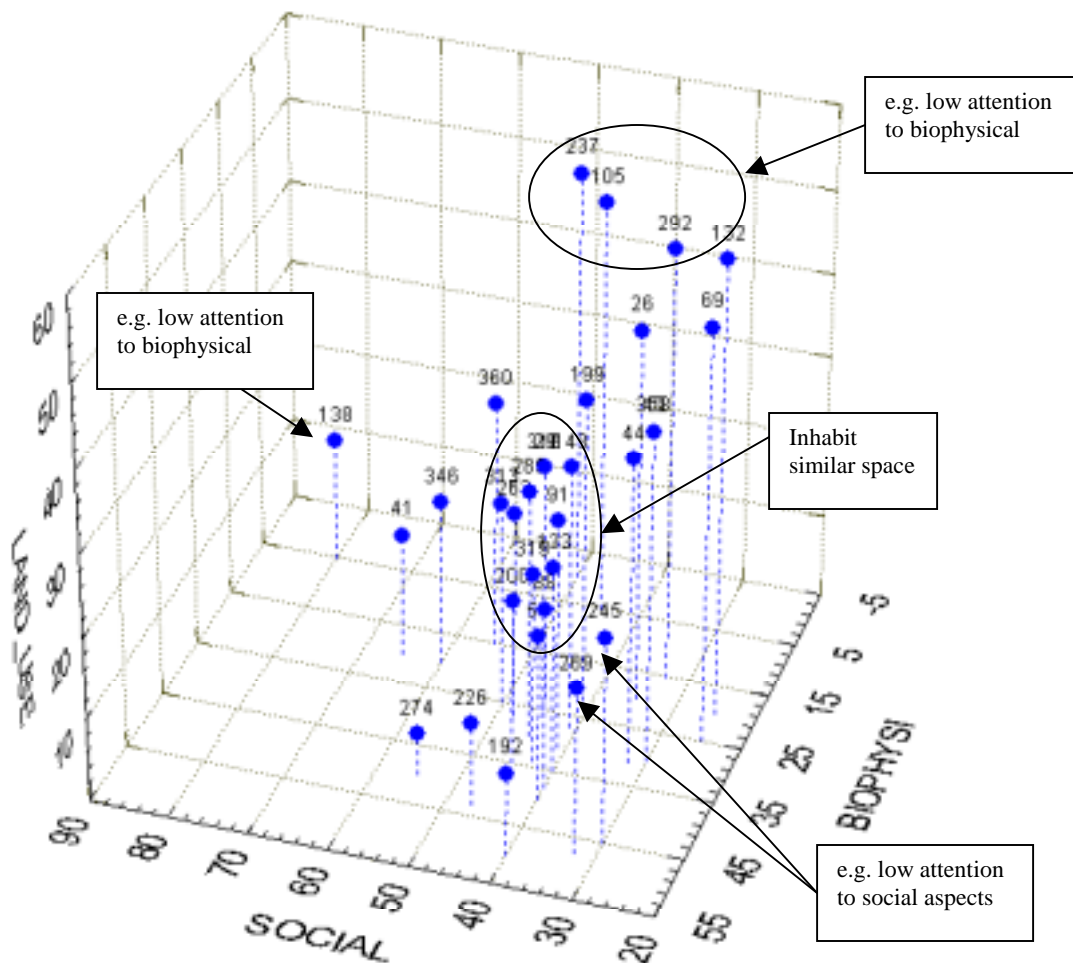


Table 4 Reclassification of Topics into Social, Biophysical and Land Use change Topics

CP Number	Social	Biophysical	Land Use
26	35	20	45
29	45	25	30
40	30	30	40
41	65	20	15
44	32	31	37
54	40	40	20
69	25	25	50
88	40	38	22
91	41	31	28
105	45	5	50
132	25	20	55
133	40	35	25
138	80	5	15
148	41	27	32
192	40	50	10
199	41	22	37
200	45	35	20
226	47	43	10
237	50	0	50
245	30	45	25
263	48	27	25
269	32.5	47.5	20
274	55	40	5
285	45	30	30
292	33	15	52
313	50.3	25	24.7
318	45	25	30
319	43	34	23
346	60	20	20
358	30	30	40
360	55	15	30

Annex 1 Self – Assessment of Theme 2 Preposals by Project Managers

CP Number	26	29	40	41	44	54	69	88	91	105	132	133	138	148	192	199	200	226	237	245	263	269	274	285	292	313	318	319	346	358	360
Land use land cover/ soil erosion / land degradation	10	0	5	0	4	0	10	6	8	20	10	0	5	11	10	14	2	0	20	25	5	13	0	5	8	4.7	5	5	0	20	15
Environmental services / externalities / degradation	15	0	10	0	2	0	5	5	6	20	20	0	5	5	0	1	2	0	0	0	5	0	0	5	0	6.7	0	2	0	0	0
Risk and vulnerability	0	0	0	5	2	0	5	0	5	0	5	15	0	0	0	10	6	10	0	0	5	7.5	5	5	10	3.3	10	5	0	0	5
Crop Water productivity	0	0	0	10	2	30	0	8	9	5	0	15	0	5	20	4	15	15	0	0	3	13	5	5	15	2	15	6	0	0	0
Water conflict / social conflicts / water rights	0	5	0	10	2	15	10	5	2	0	5	5	15	0	0	3	0	0	10	0	10	0	0	5	5	14	0	4	20	10	10
Participatory research / learning process / gender / collective action	0	20	0	10	2	10	5	5	5	20	5	10	20	5	10	13	8	8	20	10	10	13	10	5	15	7	20	7	20	5	20
Scaling	0	0	0	5	10	0	5	5	5	0	5	0	20	5	5	3	5	10	0	0	2	0	5	5	0	4	0	4	0	5	0
Institutional Issues	10	0	5	5	10	10	0	5	2	15	5	15	20	5	5	6	2	0	20	0	8	5	10	5	0	5	15	4	0	10	10
Impact assessment	10	0	15	10	0	0	0	5	6	10	0	0	5	5	5	3	5	8	0	0	3	5	5	5	0	2	0	7	0	0	0
Catchment's's Hydrology	0	10	15	0	10	10	0	10	5	0	10	0	0	12	0	7	5	0	0	25	8	5	0	5	0	8	0	8	10	15	5
Rainfed agriculture drylands	5	0	0	0	0	0	5	0	6	0	0	15	0	5	25	8	10	15	0	10	5	15	35	5	0	2	10	8	0	0	0
Irrigation	0	15	5	5	2	0	0	4	3	0	5	5	0	0	0	8	10	0	30	0	2	0	0	5	10	0	5	3	0	0	0
Water quality	0	0	0	5	2	0	15	0	2	0	0	0	11	0	0	0	0	0	0	0	5	0	0	5	12	0	0	1	0	5	10
Water Availability/allocation	10	15	0	10	2	0	15	10	4	0	0	5	5	0	0	8	0	10	5	15	0	5	0	5	0	10	0	7	0	5	10
Climate change	0	0	0	0	2	0	0	0	3	0	5	0	0	0	0	0	0	0	0	0	1	0	0	5	0	0	0	0	0	5	0
Upstream-downstream interactions	20	15	20	0	25	20	15	7	4	10	15	5	5	5	0	4	0	0	0	0	3	0	0	5	12	10	10	7	20	15	0
Field monitoring	0	0	5	5	0	0	5	5	5	0	0	5	0	11	5	5	5	6	0	0	5	0	5	5	13	3.3	0	4	0	0	5
Modeling	5	0	15	0	15	0	5	10	4	0	5	0	0	0	5	3	5	5	0	0	5	0	0	5	0	3	0	5	10	5	0
Decision Support Systems	15	20	5	0	6	0	0	0	4	0	0	0	0	5	0	5	10	5	0	10	7	0	0	5	0	7	5	2	0	0	10
Generalization/extrapolation	0	0	0	15	0	5	0	5	7	0	5	0	0	5	0	3	5	0	0	0	2	0	0	5	0	5	0	5	20	0	0
Technology adaptation	0	0	0	5	2	0	0	5	5	0	0	5	0	0	10	0	5	10	0	10	1	10	20	5	0	3	5	6	0	0	0

CP Number	Manager	CP Number	Manager
26	Drechsel	200	Hatibu
29	Andreini	226	Waddington
40	Masiyandima	237	Pant
41	Penning de Vries	245	McVicar
44	Merrey	263	Bousquet
54	Pandey	269	Asante
69	Sanz (Brown)	274	Mgonja
88	Sharda	285	Gumbricht
91	A.K. Srivastva	292	McCarthy
105	Manase	313	Amede
132	Moreno	318	Musvoto
133	Jonker	319	Salkini
138	N.Johnson	346	Noordwijk
148	Amezquita	358	Kanninen
192	El-Monein	360	Stroud
199	F.Turkelboom		

Annex 2 Pearson correlation of proposals with two variables association coefficient

CP Nr	26	29	40	41	44	54	69	88	91	105	132	133	138	148	192	199	200	226	237	245	263	269	274	292	313	318	319	346	358	360
26	1	0.28	0.58	-0.38	0.48	0.02	0.29	0.12	0.02	0.48	0.43	-0.14	0.05	0.12	-0.14	-0.04	-0.25	-0.21	-0.06	0.07	0.07	-0.04	-0.14	-0.20	0.37	0.06	0.06	-0.03	0.26	0.03
29	0.28	1	0.15	0.00	0.25	0.16	0.15	0.13	-0.25	0.06	0.06	-0.03	0.14	-0.01	-0.26	0.24	0.14	-0.12	0.30	0.27	0.36	0.06	-0.21	0.20	0.46	0.27	0.17	0.35	0.14	0.41
40	0.58	0.15	1	-0.43	0.67	0.12	0.03	0.45	0.00	0.25	0.51	-0.34	-0.13	0.18	-0.25	0.00	-0.16	-0.34	-0.11	0.07	0.03	-0.32	-0.30	-0.11	0.18	-0.16	0.25	0.21	0.35	-0.26
41	-0.38	0.00	-0.43	1	-0.45	0.26	-0.05	0.16	0.14	-0.07	-0.41	0.18	0.26	-0.11	0.00	-0.11	0.12	0.19	0.09	-0.31	0.02	0.16	-0.06	0.18	0.12	0.09	0.21	0.30	-0.32	0.13
44	0.48	0.25	0.67	-0.45	1	0.33	0.26	0.39	-0.23	0.10	0.46	-0.11	0.18	0.01	-0.21	-0.01	-0.24	-0.26	-0.07	-0.01	0.03	-0.29	-0.23	-0.01	0.31	0.11	0.17	0.35	0.56	-0.13
54	0.02	0.16	0.12	0.26	0.33	1	0.03	0.38	0.19	0.18	0.14	0.41	0.20	0.03	0.24	0.07	0.22	0.06	0.05	-0.10	0.21	0.13	-0.09	0.44	0.36	0.51	0.32	0.46	0.27	0.02
69	0.29	0.15	0.03	-0.05	0.26	0.03	1	0.11	-0.23	0.09	0.17	-0.08	0.13	0.25	-0.17	-0.07	-0.57	-0.15	-0.08	0.03	0.19	0.08	-0.19	0.32	0.40	-0.11	0.06	0.20	0.42	0.35
88	0.12	0.13	0.45	0.16	0.39	0.38	0.11	1	0.24	0.16	0.24	-0.13	0.13	0.16	-0.01	-0.06	-0.07	-0.05	0.02	0.24	0.10	0.16	-0.29	-0.05	0.41	-0.09	0.53	0.31	0.38	-0.03
91	0.02	-0.25	0.00	0.14	-0.23	0.19	-0.23	0.24	1	0.28	0.07	0.09	-0.24	0.27	0.55	0.30	0.50	0.45	-0.19	0.30	-0.27	0.47	0.17	0.11	-0.15	0.17	0.42	-0.09	-0.12	-0.18
105	0.48	0.06	0.25	-0.07	0.10	0.18	0.09	0.16	0.28	1	0.55	0.08	0.47	0.24	0.14	0.42	-0.13	-0.20	0.44	0.18	0.29	0.24	-0.04	0.19	0.17	0.44	0.10	0.10	0.35	0.41
132	0.43	0.06	0.51	-0.41	0.46	0.14	0.17	0.24	0.07	0.55	1	-0.24	0.16	0.07	-0.34	0.14	-0.37	-0.55	0.12	0.09	0.08	-0.28	-0.35	-0.03	0.36	-0.04	-0.07	0.31	0.46	-0.08
133	-0.14	-0.03	-0.34	0.18	-0.11	0.41	-0.08	-0.13	0.09	0.08	-0.24	1	0.17	-0.21	0.55	0.37	0.42	0.53	0.21	-0.14	0.22	0.55	0.58	0.36	-0.05	0.79	0.36	-0.08	-0.18	0.11
138	0.05	0.14	-0.13	0.26	0.18	0.20	0.13	0.13	-0.24	0.47	0.16	0.17	1	-0.04	0.00	0.20	-0.22	-0.05	0.42	-0.09	0.46	0.04	0.04	0.00	0.41	0.33	0.07	0.27	0.31	0.45
148	0.12	-0.01	0.18	-0.11	0.01	0.03	0.25	0.16	0.27	0.24	0.07	-0.21	-0.04	1	0.07	0.21	-0.09	-0.16	-0.08	0.48	0.24	0.10	-0.11	0.21	0.04	-0.09	0.14	-0.09	0.38	0.35
192	-0.14	-0.26	-0.25	0.00	-0.21	0.24	-0.17	-0.01	0.55	0.14	-0.34	0.55	0.00	0.07	1	0.31	0.58	0.71	0.02	0.20	-0.04	0.68	0.77	0.14	-0.30	0.52	0.46	-0.20	-0.15	-0.06
199	-0.04	0.24	0.00	-0.11	-0.01	0.07	-0.07	-0.06	0.30	0.42	0.14	0.37	0.20	0.21	0.31	1	0.36	0.07	0.60	0.48	0.41	0.40	0.17	0.41	0.02	0.57	0.34	0.13	0.31	0.50
200	-0.25	0.14	-0.16	0.12	-0.24	0.22	-0.57	-0.07	0.50	-0.13	-0.37	0.42	-0.22	-0.09	0.58	0.36	1	0.62	0.08	0.04	-0.07	0.30	0.36	0.22	-0.35	0.46	0.25	-0.17	-0.51	-0.17
226	-0.21	-0.12	-0.34	0.19	-0.26	0.06	-0.15	-0.05	0.45	-0.20	-0.55	0.53	-0.05	-0.16	0.71	0.07	0.62	1	-0.32	-0.02	-0.15	0.61	0.64	0.07	-0.24	0.36	0.47	-0.31	-0.51	-0.17
237	-0.06	0.30	-0.11	0.09	-0.07	0.05	-0.08	0.02	-0.19	0.44	0.12	0.21	0.42	-0.08	0.02	0.60	0.08	-0.32	1	0.15	0.29	0.11	-0.05	0.30	0.00	0.41	-0.06	0.08	0.29	0.47
245	0.07	0.27	0.07	-0.31	-0.01	-0.10	0.03	0.24	0.30	0.18	0.09	-0.14	-0.09	0.48	0.20	0.48	0.04	-0.02	0.15	1	0.30	0.52	0.13	-0.13	0.23	0.05	0.41	-0.02	0.52	0.44
263	0.07	0.36	0.03	0.02	0.03	0.21	0.19	0.10	-0.27	0.29	0.08	0.22	0.46	0.24	-0.04	0.41	-0.07	-0.15	0.29	0.30	1	0.13	-0.02	0.12	0.59	0.28	0.16	0.35	0.34	0.75
269	-0.04	0.06	-0.32	0.16	-0.29	0.13	0.08	0.16	0.47	0.24	-0.28	0.55	0.04	0.10	0.68	0.40	0.30	0.61	0.11	0.52	0.13	1	0.55	0.11	0.01	0.52	0.63	-0.19	0.05	0.32
274	-0.14	-0.21	-0.30	-0.06	-0.23	-0.09	-0.19	-0.29	0.17	-0.04	-0.35	0.58	0.04	-0.11	0.77	0.17	0.36	0.64	-0.05	0.13	-0.02	0.55	1	-0.13	-0.24	0.42	0.42	-0.20	-0.29	-0.12
292	-0.20	0.20	-0.11	0.18	-0.01	0.44	0.32	-0.05	0.11	0.19	-0.03	0.36	0.00	0.21	0.14	0.41	0.22	0.07	0.30	-0.13	0.12	0.11	-0.13	1	-0.09	0.48	0.03	0.17	0.07	0.32
313	0.37	0.46	0.18	0.12	0.31	0.36	0.40	0.41	-0.15	0.17	0.36	-0.05	0.41	0.04	-0.30	0.02	-0.35	-0.24	0.00	0.23	0.59	0.01	-0.24	-0.09	1	-0.01	0.30	0.60	0.45	0.38
318	0.06	0.27	-0.16	0.09	0.11	0.51	-0.11	-0.09	0.17	0.44	-0.04	0.79	0.33	-0.09	0.52	0.57	0.46	0.36	0.41	0.05	0.28	0.52	0.42	0.48	-0.01	1	0.33	0.12	0.03	0.33
319	0.06	0.17	0.25	0.21	0.17	0.32	0.06	0.53	0.42	0.10	-0.07	0.36	0.07	0.14	0.46	0.34	0.25	0.47	-0.06	0.41	0.16	0.63	0.42	0.03	0.30	0.33	1	0.31	0.18	0.01
346	-0.03	0.35	0.21	0.30	0.35	0.46	0.20	0.31	-0.09	0.10	0.31	-0.08	0.27	-0.09	-0.20	0.13	-0.17	-0.31	0.08	-0.02	0.35	-0.19	-0.20	0.17	0.60	0.12	0.31	1	0.33	0.18
358	0.26	0.14	0.35	-0.32	0.56	0.27	0.42	0.38	-0.12	0.35	0.46	-0.18	0.31	0.38	-0.15	0.31	-0.51	-0.51	0.29	0.52	0.34	0.05	-0.29	0.07	0.45	0.03	0.18	0.33	1	0.41
360	0.03	0.41	-0.26	0.13	-0.13	0.02	0.35	-0.03	-0.18	0.41	-0.08	0.11	0.45	0.35	-0.06	0.50	-0.17	-0.17	0.47	0.44	0.75	0.32	-0.12	0.32	0.38	0.33	0.01	0.18	0.41	1