Table 4.2. Scenarios of warming (ΔT_a) for the territory of Kyrgyzstan by seasons and in average per year for 2050 and 2100 according to three models of Magicc&ScenGen for IS92a and IS92c emission scenarios

Emission scenario	Seasons of 2050					Seasons of 2100				
	W	Spr	S	F	Year	W	Spr	S	F	Year
HadCM-2 model										
IS92a	1.5	1.3	1.4	1.5	1.4	3.2	2.6	3.1	3.2	3.0
IS92c	1.5	1.2	1.5	1.5	1.4	2.3	1.7	2.5	2.4	2.2
UKTR model										
IS92a	2.2	2.5	1.9	2.0	2.2	4.5	4.8	4.2	4.1	4.4
IS92c	2.0	2.0	1.9	1.9	2.0	2.7	2.7	2.6	2.5	2.7
CSIRO2-EQ model										
IS92a	1.6	1.8	0.6	1.2	1.3	3.5	3.6	1.8	2.7	2.9
IS92c	1.6	1.6	0.9	1.3	1.3	2.1	2.1	1.3	1.7	1.8

Table 4.3. Scenarios of precipitation trends (R_a) for the territory of Kyrgyzstan by seasons and in average per year for 2050 and 2100 according to three models of Magicc&ScenGen for IS92a and IS92c emission scenarios

Emission scenario	Seasons of 2050					Seasons of 2100				
	W	Spr	S	F	Year	W	Spr	S	F	Year
HadCM-2 model										
IS92a	1.26	1.17	1.64	1.41	1.37	1.46	1.22	1.84	1.64	1.54
IS92c	1.15	1.09	1.25	1.23	1.18	1.26	1.09	1.06	1.24	1.16
UKTR model										
IS92a	1.11	1.04	1.43	1.16	1.19	1.24	1.05	1.46	1.17	1.23
IS92c	1.08	1.02	1.11	1.04	1.06	1.11	1.02	0.89	0.99	1.00
CSIRO2-EQ model										
IS92a	1.10	1.06	1.36	1.11	1.16	1.12	1.10	1.36	1.10	1.17
IS92c	1.02	1.05	1.07	1.0	1.03	1.02	1.03	0.80	0.93	0.94

though according to both scenarios they are a little less in spring. However, one should not expect greater warming in winter than during other seasons.

The UKTR model predicts a higher level of warming by 2100: for IS92a annual ΔT_a=4.4°C. while for IS92c the level is much less – ΔT_a=2.7°C. Similarly, the seasonal spread of warming is quite even and there are only minor rises in winter temperature.

The CSIRO2-EQ model gives results almost identical to those anticipated by the HadCM-2 model. The former model 's distinctive feature is the notably higher temperature it forecasts for winter and spring compared to summer (approximately by 1.5% for IS92a).

Therefore, by 2100 the overall range of warming scenarios equals a 1.8-4.4°C rise in average annual temperature and a 1.3-4.8°C rise in temperature in different seasons.

In Table 4.3 and Figure 4.4 it is convenient to read R_a precipitation change scenarios as a percentage increase (reduction) of precipitation compared to the reference period of 1961-1990 (by multiplying listed R_a figures by 100). According to HadCM-2 model, in the case of IS92a moderately high emissions, precipitation will increase by 54% annually by 2100. With IS92c moderately low emissions, precipitation increase will be less; however, it will remain considerable – 16%. It should be noted that precipitation is likely to increase in all seasons within the range of 6-84%.

Scenarios of precipitation increase in the HadCM-2 model are the highest, and they can be considered as the scenarios, which best alleviate warming in Kyrgyzstan, most of whose territory is arid.

The UKTR model provides scenarios of a lower precipitation increase by 2100. Precipitation will rise by 23% in the case of IS92a moderately high emissions and will remain the same in case of IS92c moderately low emissions. In addition, in the case of IS92c, in summer, precipitation reduction up to 89% compared to current precipitation (i.e. 11% lower) is even possible. Seasonal precipitation changes according to this model are within the range of 89-146%.

CSIRO2-EQ model forecasts the smallest precipitation change by 2100 compared to the current: 17% increase in case of IS92a, and 6% reduction in case of IS92c. According to this model, moistening scenarios are the most unfavourable for possible conditions of future warming.

Thus, by 2100 overall range of moistening scenarios will vary from annual precipitation reduction by 6% to its increase by 54%; seasonal scenarios in general vary from 20% reduction to 84% increase.

In conclusion, it is worth emphasising again that the above-mentioned climate scenarios should be used with caution considering a range of possible prospective climatic conditions. Annual warming could be between 1.8 and 4.4°C, and annual precipitation may vary from a small reduction (by 6%) to significant growth (by 54%). However, if a single scenario had to be chosen, a preliminary expert assessment for the entire territory of Kyrgyzstan by 2100 would state that it is reasonable to expect an average annual temperature increase by 2.5 to 3.0°C, and an increase in annual precipitation by 10-15% compared to normal precipitation in 1961-1990. This corresponds to climatic changes registered in 1900-2000 and the average scenario assessment of climatic changes by 2100 according to global climate models.

In the future it is necessary to conduct a more precise evaluation of perspective climate changes in Kyrgyzstan on the basis of a more comprehensive consideration of local mountain conditions of its territory.

Figure 4.3. Diagrams of seasonal (winter, spring, summer, fall) and annual warming scenarios for the period of 2050 to 2100 on the basis of data from Table 4.2.

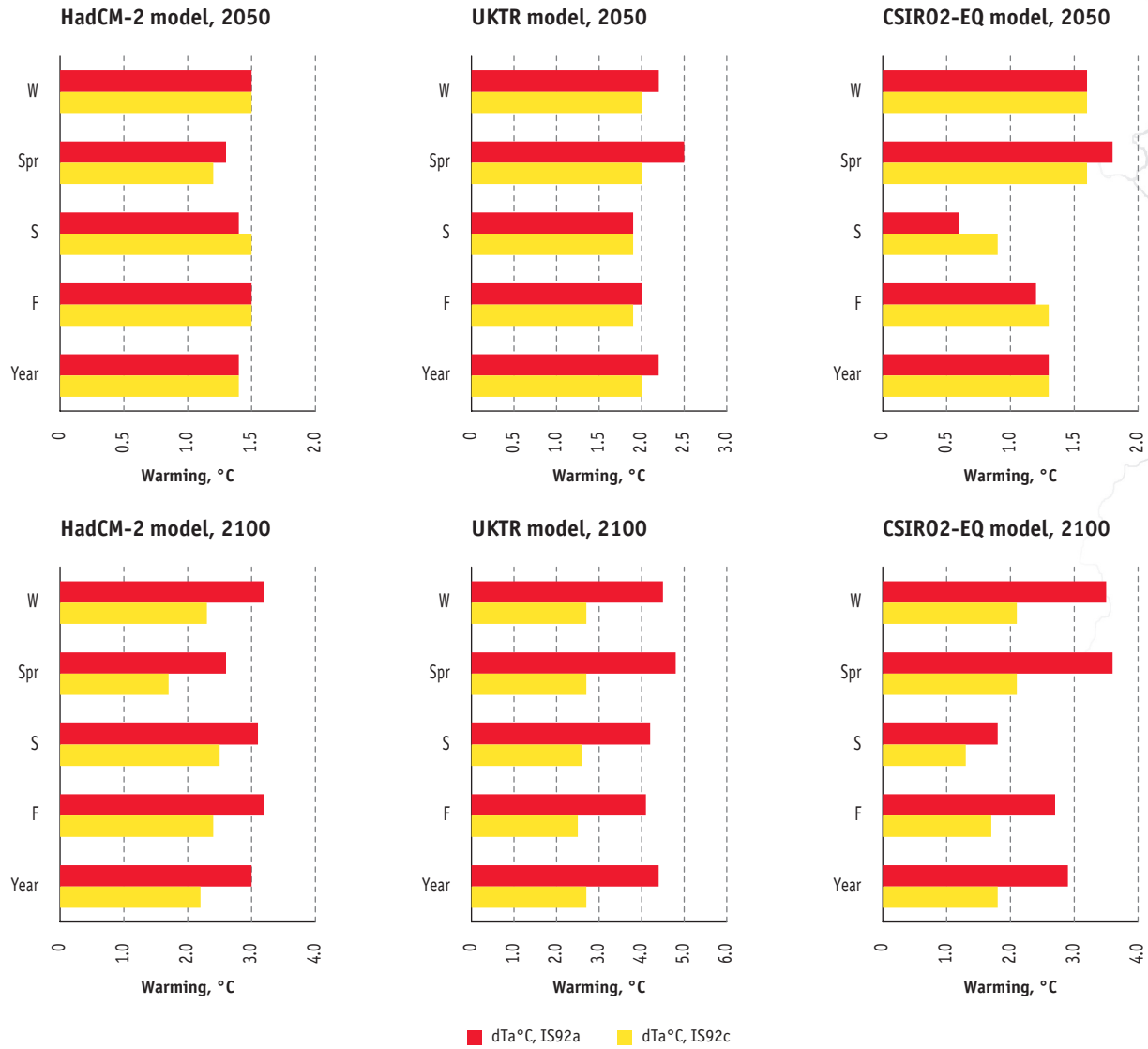

Figure 4.4. Diagrams of seasonal (winter, spring, summer, fall) and annual scenarios of moistening changes for the period of 2050 to 2100 on the basis of data from Table 4.3.