0	*Issues to consider*	Comments for end-user #1	Comments for end-user #2	Comments for end-user #3	Comments for end-user #4	Kanamaru and Delobel, FAO, climate change impact assessment (crop, hydrology, and economic) using MOSAICC	Lee & Binder	Switzerland (Hydrological modeling , discharge and groundwater)	Switzerland (Hydrological modeling , discharge and groundwater)	Switzerland (Hydrological modeling , discharge and groundwater)
1	*Variables needed (meteorological parameters and threshold indices)*	Air temperature, humidity, cloud cover/solar radiation, precipitation, wind sp/dir	temperature (min max for daily values), windspeed, radiation (shortwave or sunshine hours), precipitation, relative humidity; typical weather station data, if accuracy is good enough, degree days or precipitation thresholds could be derived from model results	"Chill Factor" capturing impacts of low temperature, precipitation and infra exposure to assess impacts	For hydropower production the crucial parameter is Runoff. In our hydrological models we use Precipitation and Temperature as driving parametres. Evaporation is of interest to validate if our models are within reasonalbe limits or not. Wind is also of interest.	Temperature (daily min and daily max) and precipitation are minimum requirement. It would be nice to have solar radiation, net radiation, humidity, wind speed, soil heat flux, evapotranspiration.	total precip, max temp, min temp, snow water equivalent (SWE), fraction of precip as rain, date of peak SWE, potential evapotransp., date of 90% SWE melt, wind speed & dir, rel. humidity, radiation, snow depth	Temperature, Precipitation, Probability for number of summer and heat days (T>25°C, 30°C, respectively) exceeding 15 days, probability for droughts as in 2003	temperature, precipitation, radiation, relative humidity, wind speed	temperature, precipitation: essential; relative humidity, wind speed, radiation: nice to have
2	*Accuracy needed (like which bias in model results in acceptable?)*	unbiased representation of current climate is important, so impact models are operating within their calibration range.	Confidence Intervals are useful	The industrial informants complain that weather infor does not provide them with specific risk values.Businesss pople cannot contribute resources to mitigantion or pre-emption of weather-induced	Should reproduce todays runoff (frequency, seasonal profile etc) when run through hydrologcial models.	Bias in wet end of precipitation distribution is acceptable, but bias in dry end is not desirable as we tend to work in semi-arid region where water stress is a concern for agriculture. For temperature, bias in cold end is more acceptable than that in warm end.		Probability distributions derived from the combination of different model chains is accurate enough	the accuracy needed has to be analyzed in a sensitivity analysis for each case study, confidencal intervals might be a help to use upper and lower boundaries as input parameters	I can really not answer that.
2.1	*quantified degree of precision?*		Temperature +/- 0.5 K, wind +/- 0.5 m/s, radiation +/- 5%, precipitation +/- 10%, relative humidity +/- 5%		0.1 degree C and 1 mm/day	0.5 degree C and +/- 10% for precipitation but it is only my gut feeling... We never assessed precision needs, I think.		Temperature: 0.2°C, Precipitation: ?	might be of help to assess the reliability/quality of the downscaled data	see above
3	*spatial resolution needed*	generally point (synthetic climate station data)	depends on region (or on spatial gradients of climate elements) and could be derived from 2,1 (degree of precision). If the region is highly orographic (with strong gradients of climate elements) even 1 km x 1 km would be to coarse, otherwise 20 km x 20 km could be sufficient.		same as observations	We can work with downscaled data at weather observation points, as we have our own spatial interpolation schemes if necessary. Hydrology model tends to require higher resolution than crop models (often higher than 1km).	1/16 deg, approx. 6km x 6km	25km * 25km or better	meteorological station or 100 x 100 m	either meteorological station or 500 x 500 m
4	*Time resolution*	daily/hourly	A lot of impact models in agriculture work with daily values. Models for instance for fungal pests (useful for pest management) often needs hourly values, erosion or surface runoff models maybe need even 15 min. data. Short timescales are only reasonable, if the accuracy could be maintained.	Daily value, especially	daily values	daily. 10-daily, monthly (depends on models)	daily, monthly	Monthly values or better	hourly and daily data	my model runs with hourly data…
5	*Further characteristics (points, spatial fields,extremes,...)*		If the quality of timeseries of climate elements is ok, further characteristics are not as important	Precipitation is important in comb with other weather dimensions: temp and wind strength/direction		good representation of extreme events is desirable (droughts, floods, heat wave, typhoons etc) as they often are a determining factor for season's crop yields	extremes	-	It would be best to stay with calendric days, to avoid inhomogenuous data set (when combining different data sets)	no
5.1	*Are inter-dependencies between different elements (e.g. between temperature and precipitation) important?*	yes	Yes		yes, especially precipitation-temperature inter-dependencies.	yes. Crop models derive evapotranspiration from temperature data. And then the models use evapotranspiration together with precipitation for simulation of crop growth. Therefore the input data need to be consistent between temperature and precipitation.		Both precipitation and temperature for a region for the impact of heat waves	yes, highly important	yes
5.2	*Is time structure and typical chronology (transition between wet/dry, persistence, etc) important?*	yes	Yes	Rain, snow and wind direction and strength. Also, info on type of snow		yes seasonal shifts is important as they will determine optimal cropping calendar		Yes, the length of wet spells, droughts and heat waves is important.	yes	yes
5.3	*Are spatial dependencies important?*	sometimes	Yes	Combination of low temp, minus 20centigrade and heavy prec.30mm		yes we tend to model multiple points within the country, or on grids. Data at points or grids need to be consistent with each other. This spatial consistency is especially important for hydrological modelling.		Yes, the spatial extent of precipitation and temperature are important for flood risk. However, I do not directly use it in my work.	yes	yes
5.4	*Is information exceedances (portion of cases above a given threshold and peak-over-threshold) important?*	less important that time-series	is important, but could be derived from the times series of the model results	Yes, this info would help industrial and transport operators in road and railway sectors.		yes they are important information for agriculture sectors and adaptation planning. If this information is reliable it could help to assess crop failures due to floods and drought, for example.		Yes, see question 1: Probability for number of summer and heat days (T>25°C, 30°C, respectively) exceeding 15 days, probability for droughts as in 2003	no	no
5.5	*Are timing issues (when is it snow-free?) important?*	no	Yes	Has bearings on quality of infrastructure, especially catenary and track surface		yes potentiallly important information for agriculture sectors, but not for use with current models	yes	No.	no	no, but the "snow-free" information could actually be valuable to verify simulations
5.6	*How are confidence intervals and sensitivities accomodated for?*	use results derived from multiple GCMs	maybe confidence intervals could be extended to impact model results and are useful to know more about model results uncertainties	Different climatic parameter will definitely have impacts on construction industry, especially in		Mutiple emission scenarios and multiple GCMs are accounted for			CI are not considered, but they might be used in special uncertainty propagation studies	not at all
5.7	*Do reliable probability distributions suffice?*	no, requrie time-series	Tthe impact models I know work with data of weather stations and the probability distributions should be comparable to the observed pdf's.	Not for taking long-term decisions on preparedness building by industrial and transport operators.		Probability distribution alone cannot drive current models		Yes.	no	I guess so.
5.8	*Is the story-line important?*	no	Yes			It is important for deriving policy implications for climate change adaptation from modelling results		No.	yes	yes
5.9	*Is the source of the original information of interest?*	usually, the downscaled data will be based on specific onservations (eg road weather stations)	Yes	Time horison of weather forecast may vary with application area and type of user. Transport infrastructure		yes for weather observations but precise information on location and elevation and any changes in station location in the time series is usually sufficient		If a multi-model combination is applied it would be nice to know what the single models are most sensitive to and which models were the most extremes. Also, there should be information on the methods how the probability distribution was obtained.	yes	always
6	*The time horizon of interest*	2050-2100	the next fifty years	2050 perspective is important for planning new transport infrastructure.	25 and 50 years ahead (pluss at least 15 years timespan before and after)	most imporatnt is the next 20 years, but we are ready to model up to end of 21st century		2100	yes, 1900(1960)-2100	21st century
7	*What is your planning horizon?*		next week		next hours up to 50 years from today.	from seasonal up to 10 years when we deal with climate change issues		Decisions for groundwater pumping have an impact in the range of decades.	i do not plan	decades to century
8	*Which seasons are you interested in mostly?*	varies by application - winter for roads, summer for heat stress and extreme precipitation, spring for floods	for water budget the whole year (refill in winter), for grape production the vegetation period (April - Oct), for phenology whole year		All	all		Warm season.	entire year	whole year

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9	*The purpose for which the data are needed*	climate change impact studies on road maintenance; outdoor thermal comfort; flooding	assessment for drought stress risk and need for irrigation (particularly for steep slope viticulture), suitability of grapevine varieties, shifts in phenological stages and growing regions, late frost risk, warm and humid weather during ripening period, and to look for risks we might not know		Energy production	Agriculture and food security, particularly crop production and water resources, plus economic implications. Livestock, aquaculture, and fisheries are other sectors we deal with, but there are not many models for assessing climate impacts in these sectors yet.		Input for the prediction of groundwater temperatures.	floods, hydrographs, sensitivity analysis	adaptation (in the long run)
10	*Will the use of the data will imply some direct action?*	recommendations only	Yes, adaptation strategies have to be evolved, lack of infrastructure or political framework for irrigation…	Policy on buiding national/regional preparedness and mitigation measures towards climate change has to rely on weather forecast.	Input for decision making: Economy and design of power plants and financial market operations.	yes modeling results using the data will lead to adaptation policies at national and sub-national level, if used in projects with counterpart ministries that aim beyond just scientific exercise	for some: included in planning	Not directly.	partly	maybe, hopefully. see above
11	*Which group of stakeholders is interested (in the MoU we defined three different groups).*	planners, local government, emergency services, architects	I use model results for impact modelling and my stakeholders are scientist who work on adaptation strategies, state agencies, vine growers organizations			national ministries and institutions, local administrations and institutions, international organizations, civil society organizations, private sectors	Federal, state and local government, NGOs, Academic, Tribe, Private Sector	Operators of drinking water supply.	government	government
12	*Do stakeholders just need data or would they also appreciate to get some guidance along with the data*	would liike some interpretation of results	guidance will be needed in several cases		Guidance which scenarios and climate models are most apropriate for what questions and geographically locations	they very much appreciate guidance along with the data	data sources, data description, data contact information, uncertainty, assumptions	They probably do not even need too detailed information on the data but more guidance on how to change practices.	data and guidance	they expect results, i.e. 'post-processed' data
13	*Accessability and data format needed*	usually will deliver analysis of the data (changes, etc) and not data themselves	netcdf has the possibility for some metadata informations. But important is that the model results have the same variable names, same file format, same grid, same physical units and the same calendars.		downloadable netcdf from the web	download of raw data for experts, and visualization of data for non-experts	Excel, ASCII, netCDF, web download, FTP,	ASCII files containig the data and and an additional readme file containing information about the the data. The data file should contain only data and no additional information.	txt, ncdf	textfile to download are fine
14	*Are other factors important? More/less?*		possible changes in variability (inter-annual, for instance dry year / wet year, also from month to month) are very very important to evaluate risks and to develop suitable adaptation strategies for agriculture.			more information about climate variability in the coming decade, rather than several decades, is very much appreciated			no	no
15	*General comments*									