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**The term “climate” in science.
Is UNFCCC terminology ambiguous without this term?**

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ABSTRACT: Science is supposed to use with care words, terms, and definitions. We discuss the particular relevance of weather and climate related terms, which had been in the general public domain since time immemorial, and only more recently became part of a wider climate terminology in politics and science. In this respect, UN Framework Convention on Climate Change, 1992 (UNFCCC), is to name, which defines “climate change” and “climate system”, while it is silent on the words: weather and climate. We investigate the meaning of the relevant terms, and whether the stipulations are used sufficiently for this purpose. This requires looking at the ordinary meaning as used since Ancient Greek and how modern science explains the terms nowadays. And we must analyze if this explanation is given in a manner that avoids confusion, misleading interpretation, or time consuming explanations. This includes a review of the terminology used by the World Meteorology Organization (WMO) and other national and international institutions, e.g. the Intergovernmental Panel on Climate Change (IPCC) which claims that weather and climate are closely related, but there are important differences we will highlight, before drawing the attention to the terminology of the UNFCCC. It is the major legal instrument with regard to climatic matters, and definitions provided should be unambiguous. We raise doubts whether the currently applied climate terminology is definite and intelligible, and in brief, identify an option for a more reasonable solution.

A. Introduction

What is the difference between partly cloudy and partly sunny, or warm and cold weather? In Australia, in China or in North America? You know, we know, the weather forecaster know! Often we need much more specification, concerning season, location, temperature, and humidity conditions. But we know as we have a lot of knowledge about weather conditions and a lot of experience. Every day we are confronted with weather, we talk a lot about the weather, and are usually keen to know what it is happening next with the weather. For this reason we are grateful for being advised about the weather today, tomorrow, and beyond, and usually do not raise any question when “weather” is described as:

- Weather is a short-term phenomenon, describing atmosphere, ocean, and land conditions hourly or daily.
- Weather is the atmospheric condition over a small area and a short period of time. For example rain is a type of weather.
- Weather is not constant. It is dynamic and always changing.

As it works fairly well for a couple of days, it is less convincing with regard to months, years, and millenniums. This touches the question how science handles the terms: weather, average weather, and climate, as science is supposed to use words, terms, and definitions with care. Even more, a reasonable definition is a paramount precondition for sufficient scientific research.

The ultimate source to provide an answer should be the United Nations Framework Convention on Climate Change from 1992 (UNFCCC). Although the word climate is prominently included in the title, the Convention is silent on the term “climate”. Instead, Article 1 defines in paragraph 2: Climate Change, and in paragraph 3: climate system, and seven other terms. This needs not necessarily to be a shortcoming if the term is well defined elsewhere or comparably understood by all concerned. As the UNFCCC is an international legal instrument, it is binding to all state parties. Moreover, the text of the convention is the baseline for any discussion, agreements, and implementation of subjects covered by the Convention. The two mentioned UNFCCC definitions therefore take a center stage. Is the lack of a conventional definition of the term climate a serious deficiency? Or are the two subsequent definitions, “climate change” and “climate system” sufficient to regard them as scientifically relevant and reasonable? The question is, whether the word “climate” is properly used by politicians and science, and it is not an irritation to the general public. The investigation shall be a practical exercise and not an excursion of philosophical considerations, as can be found in the work of Aristoteles, Hegel, Hempel, Wittgenstein and Popper, and aims more at initiating awareness about the issue rather than offering final conclusion on how to deal with term and definitions in an academic way.

However, the reader should know and bear in mind that we regard it as a hopeless exercise to define in one phrase or term past or future weather condition over a fixed or unfixed period of time. But if that is the case the word “climate”, it should not be used by science, as “climate” is a layman’s term for several thousand of years. If science is using the word Climate unspecified and undefined, then this is raising confusion and misunderstanding. Science should do whatever possible to avoid any kind of misleading, or not to use the word “climate” at all. But if they wish to use a layman’s term “climate”, then they should state why and relate it to driver the of the system in question, the Oceans, which will briefly be discussed in the paper’s conclusion.

B. Overview – How science is using the terms Weather and Climate

This section shall provide a basic overview on how the two terms are presented by the relevant institutions. This is necessary as it wasn’t done in an uniform manner, but in a varying manner. As it will not be always immediately clear, whether it is only a different wording but means the same, or includes a substantial change in the meaning, this will be elaborated in the subsequent section separately. The comments on terms in this section will therefore be only in general and brief.

The historical context

The Ancient Greek meaning of “klima” is: *inclination*. It had to do with the height of the sun above the horizon but was used as synonymy for the effect of the seasons at different locations regarding wind, water, and terrain, and the particularities of the weather. In this broad context the word “climate” was used for more then two thousand years. As soon as meteorology, as a scientific discipline, had been established in the 18th Century, “climate” was e.g. explained as the total sum of the meteorological phenomena that characterize the average condition of the atmosphere in a certain place on the Earth's surface¹. At a general meeting, in Warsaw, 1935, the International Meteorology Organization (IMO, later WMO) confirmed

¹ Hann, Julius (1897), *Handbuch der Klimatologie*. 2nd ed., Stuttgart. Translation (1903): Handbook of Climatology. New York and London.

that: “Climate is the average weather”, which is still in use today² by the same organization. Actually, the IMO adopted the years 1901-1930 as the “climatic normal period”³. While this time period is no longer applied as baseline, the Intergovernmental Panel on Climate Change (IPCC) mentions the duration of 30 years as “classical period”, including in the “period of time ranging from months to thousands or millions of years”⁴. Both institutions say that in a wider sense “climate” is the description of the state of the climate system.

WMO - The authoritative voice

We start with the World Meteorology Organization as it is a specialized agency of the United Nations (UN). Within the UN system, the WMO understand itself as “the authoritative voice on the state and behavior of the Earth's atmosphere, its interaction with the oceans, the climate it produces and the resulting distribution of water resources”⁵. WMO originated from the International Meteorological Organization (IMO), which was founded in 1873. More than 180 States are members of WMO.

The WMO website does not spend much space on the term climate and weather. We failed to find a Glossary⁶. However the WMO site has a theme-section⁷, which includes the two terms in question. Concerning weather, the section “Weather” offers no explanation, but has the opening sentence: “*Everyone is interested in the weather*”, while subsection: What is Climate⁸ begins with the sentence: “*At the simplest level the weather is what is happening to the atmosphere at any given time.*”(A) In the same section the Organization offers for climate three options, namely:

- in a narrow sense Climate is usually defined as the “average weather”, (B)
- in a more rigorously way, Climate is the statistical description in terms of the mean and variability of relevant quantities over a period of time (C), and
- in a broader sense, Climate is the status of the climate system which comprises the atmosphere, the hydrosphere, the cryosphere, the surface lithosphere, and the biosphere (D).

None of the items is very clear and can hardly be regarded as explanatory. Here is a brief comment on each item (A-D):

(A) It is not very enlightening and not necessarily correct, for example:

² WMO, *What is Climate?* The first paragraph reads: “At the simplest level the weather is what is happening to the atmosphere at any given time. Climate in a narrow sense is usually defined as the «average weather», or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time.”, http://www.wmo.int/pages/themes/climate/understanding_climate.php#a, Visited: the 19th of October 2009

³ Weart, Spencer (May 2009); *Discovery of Global Warming; Climatology as Profession*, Visited: http://www.aip.org/history/climate/climogy.htm#M_1_

⁴ IPCC, 2007, *3rd Assessment Report, Glossary of Terms, Annex B*, p. 368, <http://www.ipcc.ch/pdf/glossary/tar-ipcc-terms-en.pdf>

⁵ WMO-Homepage/About us/*WMO in brief*; first paragraph (visited: November 2009)

⁶ Under Home/Theme/Topics there is a reference to a “*Glossary (Meteo-term)*” the link was not operable (IT-address not found) and a “*Glossary (WMO Secretariat)*”, which provides abbreviations only. See: http://www.wmo.int/pages/themes/index_en.html

⁷ WMO op.cit (Fn.2); Go: Home/Themes/Weather or Climate; or: Home/Topics/Weather or Climate

⁸ WMO-Home Page; Via Topic or Theme: Climate/Climate System/Understanding Climate/What is Climate published in January 2010 at:

- a. The boundary between the Earth's atmosphere (Kármán Line) and outer space is at an altitude of 100km, but weather happens only up to 17km (equator) and 7km (poles).
 - b. The reference to "any given time" is questionable, as any time period longer than a few days, would – according to the next definition (B) - be: climate.
- (B) Science can describe and work with "average weather" only by means of statistics of physical observations. Once a statistic it remains a statistic. Statistics⁹ depend on collected numerical data, and as such can not be "fixed" for historical scenarios, or future scenarios. In this sense a past or future climate is impossible to 'portray'.
- (C) There is actually no difference between climate in a "narrow sense" (B) and in a more rigorously way (C), but a confirmation average weather shall mean a statistical description, whereby the reference to "the mean and variability of relevant quantities" is completely vague and unclear.
- (D) It is hardly to see what it is meant with "broader sense" and an example of a case explaining something in circularity.
- a. A formula: Climate is the status of the climate system, makes no sense.
 - b. According to the given explanation of climate (B & C), climate system would mean
 - i. Average weather system, or
 - ii. A statistical description of relevant quantity system, which is in no way helpful.
- (E) The word status indicates a situation, and not longer a period of time.
- (F) The reference to the "climate system" is at least confusing, as the elsewhere defined term emphasize the "interaction" among the subject fields¹⁰. Has it be left unmentioned because status and interaction do not fit well together?

IPCC, the arm of WMO

The International Panel on Climate Change (IPCC) was established in 1988 by the WMO and another UN institution, the United Nations Environment Programme (UNEP). Since 1990, it has produced four reports, which are based on peer reviewed papers. The last was released as the Fourth Assessment Report (AR4) in 2007. Also in the first report (AR1) climate was defined as the average weather¹¹, while weather received no special attention. Over the years some slightly varying explanations were used, either in the reports or in glossaries, of which we consult only the last material of the Working Group I in 2007. The glossary has not listed weather, and on climate it is said this:

- *Climate in a narrow sense is usually defined as the average weather, or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years. The classical period for averaging these variables is 30 years, as defined by the World Meteorological Organization. The relevant quantities are most often*

⁹ Statistics is the science of making effective use of numerical data relating to groups of individuals or experiments. It deals with all aspects of this, including not only the collection, analysis and interpretation of such data, but also the planning of the collection of data, in terms of the design of surveys and experiments. Source: <http://en.wikipedia.org/wiki/Statistics>

¹⁰ UNFCCC, Article 2, para.3; "Climate system" means the totality of the atmosphere, hydrosphere, biosphere and geosphere and their interactions.

¹¹ Houghton, J.T.; G.J. Jenkins, J.J. Ephraums (ed) (1990); *Climate Change –The IPCC Scientific Assessment*, Cambridge, p. xxxv.

surface variables such as temperature, precipitation and wind. Climate in a wider sense is the state, including a statistical description, of the climate system.

This text is widely identical with the WMO text given above. But there are often variations even within the latest report of WGI. The section FAQ, which cover two topics¹², express the matter, inter alia, as follows:

- *The atmospheric component of the climate system most obviously characterises climate; climate is often defined as “average weather”. (FAQ 1.1), or*
- *Climate is generally defined as average weather, and as such, climate change and weather are intertwined. (FAQ 1.2)*

Weather vs. Climate

Addressing this topic specifically is due to the observation that during the last decade the efforts to present weather and climate as something different have grown significantly. The IPCC-WGI-2007 raised the matter in section FAQ 1.2 titled: What is the Relationship between Climate Change and Weather? By saying:

- Climate is generally defined as average weather, and as such, climate change and weather are intertwined.
- Observations can show that there have been changes in weather, and it is the statistics of changes in weather over time that identifies climate change.
- While weather and climate are closely related, there are important differences.
- A common confusion between weather and climate arises when scientists are asked how they can predict climate 50 years from now when they cannot predict the weather a few weeks from now. The authors reasoning is highly questionable when say come up with following explanations:
 - *Projecting changes in climate (i.e., long-term average weather) due to changes in atmospheric composition or other factors is a very different and much more manageable issue.*
 - *As an analogy, while it is impossible to predict the age at which any particular man will die, we can say with high confidence that the average age of death for men in industrialized countries is about 75.*
- The chaotic nature of weather makes it unpredictable beyond a few days.

In this way the FAQ goes on without demonstrating at any stage that climate is more than an imaginative view (lay man’s way) or a selective selection of weather pattern in number and time.

Some examples

About the weather	About the climate
The number of brief reference to the term weather are available in great numbers, but are widely identical with those given here: ___ Atmospheric condition at any given time or place. ___ Weather is a short-term phenomenon, describing atmosphere, ocean and land conditions hourly or daily. ___ Weather is not constant. It is dynamic and always changing. ___ Weather is the day-to-day state of the atmosphere,	The term climate is frequently closely linked to weather, directly or by “statistical means”, for example: ___ Climate is the weather in some location averaged over some long period of time. ___ Climate is usually described in terms of the mean and variability of temperature, precipitation and wind over a period of time, ranging from months to millions of years (the classical period is 30 years)

¹² Fourth IPCC - Assessment, WG I, 2007, FAQ 1.1 What Factors Determine Earth’s Climate? p 96/97. FAQ 1.2 What is the Relationship between Climate Change and Weather? p. 104/105.

and its short-term (minutes to weeks) variation. ___ In brief: the weather of any place refers to the atmospheric variables for a brief period of time. References at: http://www.whatisclimate.com/c305-what-is-weather.html	___ Climate is defined as statistical weather information that describes the variation of weather at a given place for a specified interval. References at: http://www.whatisclimate.com/a113-climate-change-weather.html
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None of the examples given is very explanatory, and it says little about what matters physically in the subject fields. Generally speaking the explanation differs little, if at all, from the popularly usage in substance, except for the range of time. As the great superficiality of the explanations leave little room for a fruitful discussion, the section is trying to do it along an explanation by the NASA.

What is the problem? Discussed along an explanations by NASA¹³ and AMS.

Science uses and explains the terms weather and climate, but seem not be able to show that they can present the words with a reasonable scientific meaning, with little or no distinction to a layman's understanding. The problem shall be discussed along the Feature of the US-NASA titled: What's the Difference Between Weather and Climate.

Under the headings: "What Weather Means" and "Things That Make Up Our Weather", the NASA explains that: Weather is basically the way the atmosphere is behaving, mainly with respect to its effects upon life and human activities, and that there are "really a lot of components" to weather, which includes sunshine, rain, cloud cover, winds, hail, snow, sleet, freezing rain, flooding, blizzards, ice storms, thunderstorms, steady rains from a cold front or warm front, excessive heat, heat waves and more.

The enumeration of weather aspects is certainly a reasonable way to explain weather. But at the same time it should make it clear that this is done on a limited scope and is an insufficient way to be used in scientific research. The topics mentioned by NASA are arbitrarily chosen from presumably several dozen weather parameters.

This is well illustrated in the way the American Meteorological Society (AMS) makes the following distinction¹⁴:

- *The "present weather" table consists of 100 possible conditions, with 10 possibilities for "past weather", while*
- *Popularly, weather is thought of in terms of temperature, humidity, precipitation, cloudiness, visibility, and wind.*

If the weather consists of 100 possible conditions, how can "past weather" consist only of 10 conditions? Who is making the selection? Who decides over the period of time, whether data are used over a period of time ranging from months to thousands or millions of years? What are the "10 possibilities for past weather"? Which mix of data represents the past weather or the future weather? The extreme shortcoming of the explanation is revealed by the reference to "popularly weather", which may reflect the layman's version reasonably, but not necessarily. If AMS Glossary actually says that popular weather exist –presumably- of five conditions, past weather consists of 10 conditions and present weather consists of 100

¹³ NASA-Home/ Missions/Climate & Global Change; The Feature, dated 02.01.2005, at: http://www.nasa.gov/mission_pages/noaa-n/climate/climate_weather.html; Visited: November 2009

¹⁴ Glossary of the American Meteorological Society (AMS), Glossary, W-index, page 19, <http://amsglossary.allenpress.com/glossary/browse?p=19&s=W>; Visited: November 2009.

conditions it seems that this is a nonsense talking. There is no such thing as small, medium, and big weather, with few, several, or many dynamo-physical atmospheric elements. Weather is either weather, or it is statistics on weather components.

This is underlined by a further NASA explanation¹⁵, whereby:

The difference between weather and climate is a measure of time. Weather is what conditions of the atmosphere are over a short period of time, and climate is how the atmosphere "behaves" over relatively long periods of time.

As just demonstrated the NASA is inconsistent by reducing the difference to a question of time. Not less superficial is the AMS Glossary by describing climate as: *The slowly varying aspects of the atmosphere–hydrosphere–land surface system; typically characterized in terms of suitable averages of the climate system over periods of a month or more, taking into consideration the variability in time of these averaged quantities.* It requires a lot of guessing and own imagination to make something up from this explanation. That the NASA does not dare to understand the terms weather and climate just in the same way as any lay person may be demonstrated with the following reference:

*Climate, however, is the average of weather over time and space. An easy way to remember the difference is that climate is what you expect, like a very hot summer, and weather is what you get, like a hot day with pop-up thunderstorms.*¹⁶

The NASA-Glossary says correspondingly¹⁷:

- Weather: “Atmospheric condition at any given time or place. Compare with climate”; while
- Climate was not listed at the glossary (when visiting the site on 23rd October 2009), whereas
- Climatology is described as: “Science dealing with climate and climate phenomena”.

As NASA draws the distinction between weather and climate as a measure of time (see previous paragraph), it seems they understand under climatology the science about “short time weather” and “long time weather”, making it difficult to regard the description as clear, correct and useful.

Summery –Weather/Climate

The presented examples hardly show that science uses the words weather and climate in a different way as the general public for some millenniums. There are variations but in substance the meaning is the same and differs not very much. That could be taken for granted if any confusing, and misunderstanding is excluded. Presumably it did not matter as long as science showed little interest in climate matters, which was the case well until the middle of the last century, until which climatology was regarded as the mere dry-as-dust bookkeeping end of meteorology¹⁸. Latest since science has raised the climate change to a top policy issue on mankind’s survival and a multi billion dollar investment matter, a need for a clarity in language and whether the matter is understood and sufficiently handled is obvious. With

¹⁵ Op.cit.

¹⁶ Op.cit

¹⁷ Glossary of NASA at: <http://earthobservatory.nasa.gov/Glossary/?mode=all>; Visited: 23. October 2009

¹⁸ Lamb, H.H. (1969); *The New Look of Climatology*, NATURE, Vol. 223, pp. 1209ff;
published in January 2010 at:

regard to defining reasonable terms on weather and climate it is not the case. Whether this inadequate approach is compensated by other terminology in use, e.g. the term climate change and climate system, is elaborated in the next section.

C. Climate terminology by the UNFCCC and others

General remarks

Taking up climate terminology beyond weather and climate, requires to put the focus on the most relevant and authoritative items, which are “climate change” and “climate system” as defined by the United Nations Framework Convention on Climate Change, 1992 (UNFCCC or FCCC). On one hand they are the most used terms since the global warming hypothesis received prominence in the 1980s¹⁹, on the other hand the FCCC is the highest international document on climatic matters and a component of modern international law.

Article 1 of the FCCC on definition uses compounded words with climate only three times. In addition to the two mentioned, there is also a reference to “natural climate variability” (para.2) without further specification. The scientific practice offers more. Glossaries, as e.g. of the American Meteorological Society, lists more than 40 items, from climate analogs to climatic zone²⁰. Article 1 FCCC is binding for the interpretation and application of the Convention, whereby the titles to the articles, in this case: Definition, are according a footnote, included solely to assist the reader. However, the text of Article 1 using always the word: means (XX means; YY means), which makes the nine enlisted items to definitions.

The Article 1 definitions of the FCCC are special with regard to those in glossaries, papers and explained e.g. by institutions, as they have to be applied in accordance of the Vienna Convention on the Law of Treaties, 1969 (VCLT). Art. 31, Para: 4 stipulates: “A *special meaning shall be given to a term if it is established that the parties so intended*”. This principle rule of interpretation requires that “the ordinary meaning is given to the terms of the treaty in their context and in the light of its object and purpose”. This important difference between the binding interpretation of FCCC definitions and those available in glossaries, etc., should be born in mind during the following elaborations, even though it is not intended to go into this matter any deeper. The following discussion continues to concentrate on the question whether science is using a clear language with regard to climate change and related terms and descriptions.

Overview on climate change and climate system

UNFCCC, Article 1	NASA & AMS Glossary ²¹
<p>For the purposes of this Convention:</p> <p><u>2. “Climate change”</u> means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over</p>	<p>NASA: The term “climate change” is sometimes used to refer to all forms of climatic inconsistency, but because the Earth's climate is never static, the term is more properly used to imply a significant change from one climatic condition to another.</p> <p>AMS: Climate change – A systematic change in the long-term statistics of climate elements (such as Temperature, pressure, or wind) sustained over several decades or longer.</p> <p>“natural climate variability”</p> <p>NASA: non</p> <p>AMS: Climate variability - The temporal variations of the atmosphere– ocean system around a mean state.</p> <p>Typically, this term is used for timescales longer than those associated with synoptic weather events (i.e., months to millennia and longer). The term “natural</p>

¹⁹ Peace Nobel Price Press Release (2007), op cit (Fn.1)

²⁰ op. cit; *Glossary of the American Meteorological Society* (AMS)

²¹ op. cit.

comparable time periods.	climate variability” is further used to identify variations that are not attributable to or influenced by any activity related to humans.
<p>For the purposes of this Convention:</p> <p>3. “Climate system” means the totality of the atmosphere, hydrosphere, biosphere and geosphere and their interactions.</p>	<p><u>NASA</u>: The five physical components (atmosphere, hydrosphere, cryosphere, lithosphere, and biosphere) that are responsible for the climate and its variations.</p> <p><u>AMS</u>: climate system - The system, consisting of the atmosphere, hydrosphere, lithosphere, and biosphere determining the earth's climate as the result of mutual interactions and responses to external influences (forcing). Physical, chemical, and biological processes are involved in the interactions among the components of the climate system.</p>

Discussion

The two terms climate change and climate system originated not in the layman’s sphere. They became prominent with the start of the global warming debate in the 1980s. Either due to this debate or a general belief of everybody to know what climate is all about, many may say that they have an idea about climate change and climate system at least in broad terms. That would be sufficient in the layman’s sphere, but unacceptable in science.

The two terms are international law and used almost daily by governments, politicians, science and organizations to pursue a high stake global agenda, specifically on global warming and greenhouse gas emissions. In the Nobel Peace Prize Lecture, 2007, the Chairman of IPCC said with regard to peace:

“.....climate change will have several implications, as numerous adverse impacts are expected for some populations in terms of: access to clean water, access to sufficient food, stable health conditions, ecosystem resources, security of settlements.”

The used terminology should therefore be clear, unambiguous, and relevant for the subject matter.

Climate Change

Concerning the term “climate change” lacks a qualifying substantive. A scientifically reasonable definition for climate is not available. Neither the FCCC offers one, nor other organization as has be shown in the previous section, has not be coming up with a reasonable explanation elsewhere. It is not possible to quantify a “change” if the subject of change is not defined. It is defiantly neither a solution to use the common explanation on “average weather”, because “average weather” is statistics, and remain statistics regardless of any name given to the set of statistics. But even if one is willing to say: OK, it is not necessarily the best solution, but better then nothing, it raises several other questionable results. There would be e.g. the problem of the selection, which weather components are chosen, two, five, twenty of hundred, to “present” past or future weather in statistics?

Another problem would be the time span. Does Climate coves two months, one year, 30 years, 1,000, or one Million years? The IPCC-2007 Glossary says that the possible time span

is without any time limit, “ranging from months to thousands or millions of years.”²². This is in a stark contrast what the predecessor of the WMO agreed in 1935, namely that the period from 1901 to 1930 should be used to express departures from mean data²³. This reflects that meteorology since its formation in the 19th century considered climate as a set of atmospheric characteristics associated with specific places or regions. In this context, while the weather was subject to change, climate remained largely stable²⁴. While trying to set a time period arbitrarily was naïve, to say the least, but even this 30-years fix is no longer taken as the standard line. The absolute minimum to give the word “change” a chance to indicate something, was abandoned, and is neglected. That indicates at least one problem. While it could make sense to observe a “change” towards a fixed value, but that would have required for defining the “fixed indicators”. Had the experts tried to do so back in the 1930s, they would presumably had been coming to the conclusion quickly that such an undertaking is reasonably not possible. It would have been either a grand failure or turned out as an explanation of essay lengths.

Climate System

The absolute uselessness of a term Climate System is quite obvious, as mentioned already back in 1992 in a letter to NATURE that it is synonym with the global “nature”²⁵. The letter asked: “What is the point of a legal term if it explains nothing?” All that this boils down to is “the interactions of the natural system”. This is meaningless tautology. Why did the authors of the UNFCCC have not defined that “weather system means the totality of the atmosphere, hydrosphere, biosphere and geosphere and their interactions”. It is saying the same as the FCCC on “climate system” or the natural system, namely nothing.

The United Nations and the FCCC

From the 07-18 December 2009 the United Nations convened the Copenhagen Conference on Climate. At the conference the parties of the UNFCCC met for the last time on government level before the Kyoto Protocol (1997²⁶) to reduce the emission of carbon dioxide runs out in 2012. The protocol was developed to meet the ultimate objective of the UNFCCC (Article 2) which is to “stabilize GHG concentrations in the atmosphere at a level that would prevent anthropogenic interference with the climate system”, through quantified emission targets within a specified time frame. For this purpose Article 17, paragraph 1 stipulates that: “The Conference of the Parties may, at any ordinary session, adopt protocols to the Convention”. But for the aim of this paper, not the result of this UN Conference is of any interest²⁷, but the fact, that the UN Conference in Copenhagen is convened on the basis of the UNFCCC.

²² “Climate in a narrow sense is usually defined as the average weather, or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years.”

²³ Kince, J.B. (1935) The Danzig Meeting of the International Climatological Commission and the Commission on Agricultural Meteorology, MONTHLY WEATHER REVIEW, 342-344. Extract: It was voted, however, that in obtaining departures from mean data to represent current conditions, or present century weather, means for the period proposed (1901-30) should be used as a base.

²⁴ Heymann, Matthias, (2009); *Klimakonstruktionen - Von der klassischen Klimatologie zur Klimaforschung*, NTM Zeitschrift für Geschichte der Wissenschaften, Technik und Medizin, pp. 171-197.

²⁵ *Letter to the Editor*, NATURE 1992, Climate Change, Vol. 360, p. 292.

²⁶ The Kyoto Protocol was adopted in Kyoto, Japan, on the 11th December 1997 and entered into force on 16 February 2005

²⁷ This paper had been prepared and finalized before the 10th of December 2009.

published in January 2010 at:

Our concern is the permanently use of the word “climate change”. The Secretariat of the UNFCCC website says in section Essential Background: *“The Convention on Climate Change sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change. It recognizes that the climate system is a shared resource whose stability can be affected by industrial and other emissions of carbon dioxide and other greenhouse gases”*²⁸. This reflects what the legal document is saying again and again, for example (extracts):

- Article 3(1) The Parties should protect the climate system for the benefit of present and future generations of humankind.
- Article 3(3) The Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects.
- Article 4 (1f) Take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions, and employ appropriate methods, for example.
- Article 4 (1h) Promote and cooperate in the full, open and prompt exchange of relevant scientific, technological, technical, socio-economic and legal information related to the climate system and climate change, and.

Even if one is willing to accept that carbon dioxide is increasing the atmospheric temperatures, it is a very different subject when it comes to the terms climate and climate change. This is not only due to the fact that the FCCC does not say what is climate, and its explanation of climate change is nonsense, but rising atmospheric temperature represent neither the “weather” nor the “atmospheric condition at any given time or place” (see: above). This ensures a highly confusing situation. Every one has its own understanding of what climate means (see: Introduction), and any discussion take place on personal imagination, believe, commitment, and wishes.

That creates an irresponsible situation. The Conference of the FCCC-Parties (Article 7) parties to the Convention shall:

(2.) „.....shall keep under regular review the implementation of the Convention and any related legal instruments that the Conference of the Parties may adopt, and shall make, within its mandate, the decisions necessary to promote the effective implementation of the Convention.“

The problem is at hand. How can the State parties handle climate matters in a sufficient and responsible manner, if they talk about weather and climate as laymen do since the Stone Age. A precise and explanatory terminology is a common and required practice in drafting treaties. The FCCC was not to be excluded from this practice as Article 1 shows, although in a very incompetent manner and the State parties do not care. The hapless victim is the general public which needs to trust that politics and science know what they are talking about.

D. Conclusion

²⁸ Secretariat of the UNFCCC, established according Article 8 of the UNFCCC ,
http://unfccc.int/essential_background/convention/items/2627.php
published in January 2010 at:

In conclusion it is to say that the currently applied climate terminology is a mess and neither reasonable definite nor intelligible. As the terms weather and climate belong to the laymen sphere, it is doubtful whether science should use them for their terminology. It would not only be difficult, if not impossible, but presumably remain a source of confusion. However, if science and politics want to use the word “climate” in service for themselves and the general public they should lay the focus on the essence of the weather system, or the driver of the weather system, by saying: “Climate is the continuation of the oceans by other means”²⁹, or to say it with Leonardo da Vinci (1452-1519): “Water is the driver of nature”.

²⁹ Bernaerts, A. , 1992, *Letter to the Editor*, NATURE , Climate Change, Vol. 360, p. 292; <http://www.whatisclimate.com/1992-nature.html>