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Opinion

Sunshine Activities and Weather/Climatic Variability during the Current Period of 1961 - 2018 Especially Over Indonesia Maritime Continent

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Sunshine could the main source of the energy from the galaxy where the earth could be one of the planets to circulate annually with the sun as the center as part of the revolution of the earth. Measuring the sun's activities would be applied from the number of solar flares and the sunspot based upon solar cycle which has average period per cycle to be 11.5 years. Based upon the observation, it has been done from the previous observation by the National Aeronautics Space Administration to be the Agency of the United States of America responsible for the civilian space program as well as aeronautics and aerospace since the beginning observation in the 18 century.

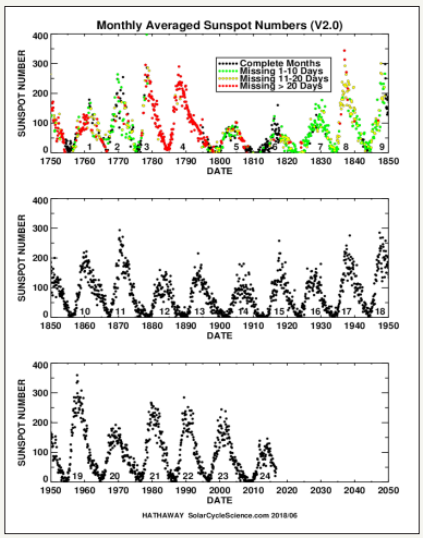

Figure 1: Description solar cycle or sunspot cycle (source:http://solarcyclescience.com/solarcycle.html).

There are 24 solar cycles with the main indicator from the total number of the sunspot on certain basis ranging daily, monthly, yearly up to cycle. Each solar cycle will be represented with the record of the sunspot number each month for a consecutive period of the solar cycle, for the understanding of the solar cycle or sunspot cycle would be represented in Figure 1 as follows, Based from the Figure 1, it can be stated that Solar Cycle has been changed and varied with respect with the time since the beginning (solar cycle1 on the period 1760-1772) up to the present (solar cycle 24 in the current period 2010- present/2018). From almost the three decades, there are variability of the solar cycle with solar cycle number 1 in the period 1750-1962 and the last solar cycle of number 24 in the period 2010 up to present time in the middle 2018. These solar cycles would represent the solar activity such that almost from the three centuries showed the variability of the sunspots number from each solar cycles.

As the sunspots would release of the photon energy of the sun as part of the sun's radiation, increasing sunspots number (up to 100 sunspots/month) would have relation with increasing of the sun's radiation that this radiation spread out to the universe as well as received by the earth as part warming episode of the . Reversal condition would be during fewer sunspots number (less of the 100 sunspots/month), the cooling episode of the earth would realize such as in the current solar activities for the solar cycle no. 24 (2010 - presently of mid-2018). Looking from the beginning period record of the solar activities in the year 1745 up to the current time in the middle 2018, there is variability of the sunspot number part of the solar activities. When the total sunspots number recorded to be less 100 sunspots on the monthly basis, it could be so called inactive condition of the solar activities and reversal for sunspots number on the monthly basis up 100 sunspots with the active condition. Based upon 24 solar cycles, there would be both inactive and active condition of the solar activities. Where from 24 solar cycles generally characterize inactive condition during beginning up to mid from nineteenth, twentieth and it could be twenty-first century (current century of the perriod 2001-2018) and the end period of eighteenth, nineteenth and twentieth centuries with the active condition of the solar activities. Another word from almost the three centuries there would be variability with the inactive condition of the solar activities in the beginning century and the active condition of the solar activities in the end century.

As weather and climatic condition would realize from the physical processes of the atmospheric condition with unequal receiving solar radiation in the earth's surface. There would be a relation between solar activities and weather and climatic condition, especially in current development from 1950 up to the present time in the middle of 2018. Based on the comparison climatic study over Indonesia Maritime Continent, there were some findings that during the active condition of the solar activities in the end twenty century up to beginning twenty-one century. There would be finding such that during four solar cycles number 19 up to number 23 almost 5 solar cycles with maximum sunspots number more than 100 sunspots/month, this period would be the active condition of the solar activities.

Only the last solar cycle number 24 (2010-the current condition in the middle 2018), the maximum sunspots number would be less 100 sunspots or in the inactive condition of the solar activities. Based upon the current weather and climate study over Indonesia, it could find that during the period active of the solar activities weather and climatic condition would be the more frequent occurrence of the El Nino episodes with the longer period of the dry season than normal condition. In reality during period 1961- up to 2010, there had been more frequent long dry season in decadal period of 1961-1970; then there had been reduced frequency of the long dry season in the decadal period of the year 1971-1980; in the decadal period of the year 1981-1990 there had been increasing activities of the weather and climatic condition beside the longer of the dry seasons period coincides with occurrences of the El Nino episodes, there was increasing of the maximum surface temperature last 1982 that this maximum surface temperature continued up to the year 2010. And it was noted that year 1982 to be the initial impact of the dry season and increasing activities of the solar in terms of the forest fires and smoke/haze in the localized areas over Borneo Island. These impact to the environment became wide areas in Indonesia coincide increasing of the human population such that in 1997, occurrence fires over the wildland and forest area to be declared a national disaster by the Indonesian government. Where in the decadal period of 1991-2000, there had been longest El Nino episode (1990-1994) and stronger, as usual, El Nino episode of the period 1997-1998.

Then these activities would be decreasing in the impact coincide with decreasing maximum number of the monthly sunspots in the decadal period of 2001-2010. Other word during the period of the solar cycle number 19 up to number 23, there had been the active period of the solar activities with the impact to the weather and climatic system in Indonesia Maritime Continent in term of the long dry season and increasing the maximum surface temperature in the land. Then these impact may support the impact to the environment with wildfire over wildland and forestry area in Indonesia Maritime Continent starting 1991-2010 with the time period of occurrences of fires and haze. It seems the dry weather/climate may encourage coincide with more frequent and longer of the dry condition to support the dry and hot environment also absolute stable air to support the development fires over wildland and forestry areas during period 1981- up to 2010. Then during the period 2011 up to present 2018 with maximum sunspot was recorded not more than 100 sunspots/months, there was the more frequent cold episode of the La Nina occurrences more frequent than the warm episode of El Nino. The El Nino 2015-2016 has occurred with the shorter period of occurrences (less than 9 months) but the wet environment was created with reducing occurrences of the fires and haze. Overall there should be the relation between variability of the sunspot number from the sun's activities with the weather/climate in general especially over Indonesia Maritime Continent.