The Somali Calendar: An Ancient, Accurate Timekeeping System

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1. Introduction

The Somalis use both solar and lunar calendric systems. The Lunar year, in which months correspond to the phases of the moon, is approximately 354.37 days. The months of the lunar year systematically shift with respect to the cycle of the seasons. The lunar calendar is used for religious observations as well as social, economic, and legal contracts. It is commonly used throughout Muslim world. The solar calendar is used for purposes such as weather forecasting, maritime travel, and identification of the seasons. This paper focuses exclusively with the solar calendar (Amin-tiris or Taqwiim[1]).

Although unfamiliar to most of the rest of the world,[2] the Somali solar calendar is one of the most fascinating, sophisticated and accurate calendars in the world.[3] Its evolution probably dates from approximately 2,500 years ago, or even earlier. Although farming and herding have historically been the leading economic activities of Somalia, it is also known as a mercantile nation. Experiences and needs from these three communities, particularly the last two, have contributed to the formation of the solar calendar.

The Somali solar year, which is a tropical year in fact, corresponds to the cycle of the seasons.[4] It is based on the weekly cycle and upon the sun, and it is organized into four seasons, twelve months, and 52 weeks plus one day or 365 days. The New Year, which is characterized by a festival called 'Dabshid'[5] falls on or around July 20, in the Gregorian calendar. Other periodic cycles are derived from the weekly cycle in order to create a calendrical year and to extend the timekeeping system beyond. As a result, various time units are established. This extended system is based on the number of 'seven.'

2. Rules of the Somali Calendar

2.1. Rules Overview

Besides the weekly cycle, there are four other major cycles in the system: the 50-day cycle, which is seven weeks plus one day; the yearly cycle which is 7 x 50 days plus 15 days; the seven-year cycle which is 7 x 365 or 2,555 days long; and the 49-year cycle which is 7 x 7 years in length. All these time units share the number of 'seven' or weekly cycle. Every unit is named after its first day, which is also the last day of yearly and 50-day cycles.

For example, the first 50 days of the Somali Calendric Year of 2007-2008, in the Gregorian system, are from Saturday July 21, 2007, to Saturday Sep. 8, 2007. The same pattern applies to the first and the last days of the year, while the first day of the year is Saturday July 21, 2007, the last day of the year is Saturday July 19, 2008, because this calendar is based on the summer solstices. Thus, the time units used in this year are 50 day intervals and 365 day intervals, and the name of this year is Saturday. These time units are carefully and systematically enumerated day by day and period by period where practice and redundancy have resulted in sophistication and accuracy.

2.2. Determining the Length of the Year

Since the yearly cycle depends on the 50-day and the weekly cycles, these three cycles are primary units of the system. Its length is determined by them. Let us take our Saturday year of 2007-2008 as an example: the first 50 days of this year are also called Saturday period. Consequently, the next 50 days are Sunday period. The remaining periods of the cycles follow the weekdays order. But, the total of the days in the cycles are 350 or 50 weeks. So that, in order to organize a year, and to allow the succeeding years to follow the order, two weeks and one day must be added to this number which results in 365 days. The following chart shows what we have said in words.

Table 1: Forming the year

The first day of the cycle	The last day of the cycle	Total number of days in the cycle	Total number of days in the year
Saturday July 21, 2007	Saturday Sep. 8, 2007	7 x 7 + 1	50
Sunday Sep. 9, 2007	Sunday Oct. 28, 2007	7 x 7 + 1	100
Monday Oct. 29, 2007	Monday Dec. 17, 2007	7 x 7 + 1	150
Tuesday Dec. 18, 2007	Tuesday Feb. 5, 2008	7 x 7 + 1	200
Wednesday Feb. 6, 2008	Wednesday March 26, 2008	7 x 7 + 1	250
Thursday March 27, 2008	Thursday May 15, 2008	7 x 7 + 1	300
Friday May 16, 2008	Friday July 4, 2008	7 x 7 + 1	350

Saturday July 5, 2008	Saturday July 19, 2008	7 + 7 + 1	365

As we have said, the first day and the last day of the year are Saturdays in our table. To create an equation, seven periods that consist of seven weeks plus one day per period would be 7x7x7+7; fifteen days are 7+7+1. The output is 7x7x7 + 7+7+7 + 1 **or** 7^3 + 7x3 +1, which are the 365 days of the year. This calculation helps ensure that an intercalation (forming leap years), is not required at least for the short term. Forming an intercalation is a weakness that cannot be avoided even by the Gregorian calendar.

There is also another way to calculate the year and divide it into seasons, months and even weeks. The year has four seasons with three months per season. The seasons are namely Xagaa (Summer) which is 91 days or 13 weeks; Dayr (Autumn) with the same number of days; Diraac (Winter) also the same number of days; and Gu' (Spring) which is 92 days or 13 weeks plus one day. Accordingly, the year is 12 months, seven of which have 30 days and five of which have 31. Xagaa and Diraac are dry seasons that are known as 'Jiilaal', while Dayr and Gu are rainy seasons known as 'Nur'.

The seasons are further divided into short periods (fasallo - fasals) of 10 to 20 days depending on the frequency of weather change. If there are signs of coming rain or actual rainfall during the fasal, they are called 'Kicin or Kacaan' (momentous weather change). There are approximately seven kicins during the Dayr and approximately ten Kicins during the Gu. The success of the Nur depends on the extent of the rainfall during the Kicins. The accompanying table shows how the seasons and months correlate with the Gregorian calendar.

Table 2: The Months and Seasons of the Somali Calendar

Seasons	**Months**	**Days**	**1st day of the month**		**Gregorian Date**	
Xagaa, 13 weeks:	Karan	31	Karan	1	July	20
	Habar-ari	30	Habar-ari	1	August	20
	Diraacgood	30	Diraacgood	1	September	19
Dayr, 13 weeks:	Dayrweyn	31	Dayrweyn	1	October	19
	Ximir	30	Ximir	1	November	19
	Xays	30	Xays	1	December	19

Diraac, 13 weeks:	Lixkor	31	Lixkor	1	January	18
	Toddob	30	Todob	1	February	18
	Aminla	30	Aminla	1	March	20
Gu', 13 weeks + 1:	Fushade	31	Fushade	1	April	19
	Gu'soore	30	Gu'soore	1	May	20
	Samuulad	31	Samuulad	1	June	19

The beginning of the first season does not exactly fall on 'Dabshid', the 1st day of the New Year. Instead, it follows the Gregorian calendar closely in that. The beginnings of the seasons usually fall in the first weeks of July, October, January and April respectively, while the New Year is around July 20.

Despite the fact that the beginnings of the four seasons do not correspond to the beginnings of the New Year and the other months, the two parts are perceived as having a standardized correlation. The disparity is only about two weeks. Additionally, the New Year and Lixkor, the first month of the second dry season, begin when the land becomes completely dry and all types of livestock are due to go to the well. Therefore, apart from this insignificant regress, the adopted months of the year systematically correspond to the seasons.

In fact, the meanings of names for the seasons and the months[6] describe the periodic nature of the names themselves. They represent fundamental human needs expressed in practical timekeeping patterns rather than ideological concerns. With the exception of Dayr, the meanings of names of other seasons are not known with certainty because of terminological obsolescence.

Nevertheless, these names are meant to convey the nature of the seasons for which they stand. For example, Xagaa means 'a partially windy and warm, dry season;' Diraac means 'a partially cold, very dry season;' while Gu means 'sufficient rainfall'. Dayr, which is derived from the term 'dayro' (unfavorable condition), means here 'less rainfall', in contrast to the Gu season. The meanings of all months are known as shown in the following table.

Table 3: Seasons in Detail

Names of Months	Meanings	Details
1.Karan	Extra (Rain)	In the North West, Karan rains come in between spring and autumn as an additional rain; on the Banaadir coast, this season is called Xagaayo (the rain of Xagaa).
2. Habar-Ari or Habar-Adhi	Sheep and Goats of old woman (Belittling)	It seems to mean that the uncertain rain during this time will only suffice sheep and goats (these animals are usually associated with females). There is little chance of rain 40 days after the new year in isolated places.
3. Diraac-good	Diraac-go = end Diraac; Diraac-good = real Diraac.	Although Diraac is a second dry season, from Jan. to Mar., this may indicate that the hottest period in Xagaa, Aug.-Sep., was also once called Diraac.
4. Dayr-Weyn	The big Dayr	The heaviest rainfall in Dayr is from Oct. 15 to Nov. 20.
5. Ximir	Red	Named after a red star that rises from the east in this period.
6. Xays	Xay = bloom; Xays probably means	Due to the effect of N.E. Monsoon, clouds are less thick, and their movements are faster; rain is lighter and tree leaves are thinner. (It is also called Bad-furan: beginning

	lightness.	of maritime commercial activities)
7. Lixkor	Over taking the Six	Moon sets with Lixo (the Six), there is little chance of rain at some isolated places.
8. Toddob	The Seven	Moon rises with another constellation. There is a chance of limited rain in a few places.
9. Amin-la'	Unreliable	Although late Aminla' is the first period of Gu (spring), it may fail to rain.
10. Fushade or Ceelka-geeye	No more going to the well	Rainfall is almost certain
11. Gu'soore, also Badhayse or Dhaseyne	Half of the Gu, prosperity, for it is the best time in the year	The level of rainfall is almost equivalent to the total amount of rain in the rest of the periods.
12. Samuulad	Prosperity; also Bad-Xiran: ending of the maritime activities	Usually it does not rain, but if it does, the Gu is robust and sufficiently prosperous. It may rain as a compensation for failed period.

2.3. The Seven-Year Cycle

Seven-year cycle is named after the days of the weak consecutively, beginning usually with Saturday and ending with Friday. For example, the first day of the Somali calendric year of 2002-2003, in the Gregorian system, was Monday July 22, 2002. The last day of that year was Monday July 21, 2003. It was therefore a Monday year. The first day of the next year was Tuesday July 22, 2003; while its last day was Tuesday July 20, 2004. Therefore, it was a Tuesday year. The seven-year cycle, thus ended with the Sunday year of July 20, 2008 to July 19, 2009. The number of days in this cycle was 2,555. Then the next seven-year cycle began July 20, 2009. The following table gives the seven-year time sequences as well as the first year of the next seven-year cycle.

Table 4: Seven-Year Cycle

The name and first day of the year	Gregorian correlation	Total number of days in the year
Monday	July 22, 2002	365
Tuesday	July 22, 2003	365

Wednesday	July 21, 2004	365
Thursday	July 21, 2005	365
Friday	July 21, 2006	365
Saturday	July 21, 2007	365
Sunday	July 20, 2008	365
Monday	July 20, 2009	365

2.4. The Forty Nine-Year Cycle

This cycle is an extension of the seven-year cycle, seven times seven years. The cycle is rarely used except for determining the age of an old person, and anniversaries of special events that need to be recalled after generations. In other words, this reckoning is a special method is used by special individuals to mark the important experiences from long ago.

For instance, suppose we happen to ask an elderly traditional man his age. Instead of telling us in exact years, he may prefer to tell us that he is 11 Thursdays old. In this case, we need to keep three things in mind: first, 11 Thursday-yearly cycles correspond to 7x11=77 years, because there is only one Thursday-year every seven years; second, our present year is a Monday year; third, we have to add to that number the three years that are between Thursday and Monday (Friday, Saturday, and Sunday), because the man is in the middle of his 12^{th} seven-year cycle. Using this calculation, he is 80 years old.

Another example would be when another elder may remind his community that it is the tenth Monday from the time they emigrated from point A to point B, or a certain well was dug, or the biggest solar eclipse occurred that they have ever experienced, and so forth. This mental exercise that requires knowing about the name of a particular year and its cycle is usually practiced by calendar experts to maintain the system.

3. Astronomical Aspects

Although the lunar and solar calendric systems operate separately, they are astronomically interconnected and share many similarities. That is because some periods from both systems are identified by moon stations (Manaasil or Fadhiga Dayaxa) which are characterized by certain stars (xiddigo) or constellations (group of stars - Urur).

3.1. Seasons Correspond Lunar Cycles

Because the lunar month consists of 28 days plus one or two days, there are at least 28 visible lunation over four weeks. Moon station or conjunction is observed nightly as the moon sets with a star or constellation. Consequently, the date of a certain day can be figured out by the position of the moon in the horizon. The star or constellation that set with the moon in each of the four weeks of every month is also identified with each of the four seasons in a year. Here, every week in the month corresponds to one quarter of the year.

Configurations Associated with the Seasons:

1 Xagaa (summer) is marked by Naaf group: Naaf Cadde (white naaf), Naaf Madobe (black naaf), Afqoys, Kuxdin Hore, Kuxdin Dambe, Dirir-day (semi-dirir), and Dirir.

2. Dayr (autumn) is marked by Dalalle group: Garbo, Gudban, Lib Casse, Hor Dameer, Hor Cadde, Mareega-Dheer, and Bah.

3. Diraac (winter) is marked by Faraci group: Faraci, Listaan, Lixo (the six), Cadcad, Saco (the cows), Nujusi, and Afa-gaal or Naasa-Gaal (camel's breasts)

4. Gu (spring): is marked by Cirir group: Faruuryo, Jid Gabarre, Jid Gacanle, Jid-Dhiriqle or Dheregle, Rab Hore, Gog Madobe, and Rab Dambe.

Some of the seasons have more than one name. Naasa-gaal, for instance, are also known as Wadaamo-goo – cutting the buckets (of drawing the water from the well). These 28 configurations are not only used for timekeeping and weather forecasting, they include extended stars that are used as horizon-marking devices. Apart from being held in high regard by the culture, these horizon-marking devices serve as essential directional guides for nightly journey both by land and sea.

3.2. Determining Dirir

By the Somali standard method of calculation, the year has two divisions. The first half of the year is called Bilo Dabshid (Months of Dabshid). In this division, the length of the months is calculated by counting the days from Dabshid, the New Year. The second half is called Bilo Dirir (months of Dirir). Dirir is a star that is identified with Spica, in the European astronomy, which is used by both the two Somali calendars to interconnect some of their operations in a particular conjunction. As a result, the conjunction is astrologically calculatable and observable by the lunation or everage time for one lunar phase cycle. The occurence of the star rising with a particular moon phase is also called Dirir.

Thus, Dirir is a monthly conjunction in which the lunar phase changes but its position in the sky is held constant. The dates of Dirir in solar months are of not much concern because almost everything is held constant. The Dirir months in the lunar system naturally shift, but a Dirir date in a given month is one of three particular days, depending on the length of the month, 29 or 30 days, so it is almost held constant.

For this reason, the first Dirir, Lixkor, falls on the 21st, 20th, or 19th of the lunar month, forcing each Dirir to occur two days later than the preceding one in the next month.

For example, suppose that Lixkor falls on the 20th of seventh lunar month, Rajab; the next Dirir, Toddob, will take place on the 18th of the following month, Sha'baan; while the sixth Dirir, Samuulaad, will fall on the 10th of twelfth month, Dul-Hijjah.

The event standardizes the beginning and the length of the solar month as well as designates the rainfall periods in the second half of the year. Right after the conjunction, there is usually rain or at least a sign of rain, depending on the fasal or season. Further, this lunisolar interconnection permits a layman to observe the Dirir in night. Since the lunar year is approximately ten days shorter than the solar year, the lunar year annually begins about ten days earlier than the last year's correspondence date. For this reason, the beginning of the lunar year and other important dates can also be estimated by ordinary observers. This gives them another way of calculating the correspondences between the two systems.

Although Dirir lasts for six monthes, a nominal Dirir, Dirir-Sagaar, is recognized to satisfy the rule of 'seven'. Dirir-Sagaar occurs prior to the eve of Dabshid, which shows its lack of Dirir requirements. In fact, some say that it is not Dirir, but part of Samuulad.[7]

4. History of the Calendar

Generally, there is no particular designated first cycle for calendars in which the years are counted in cycles. These types of calendars eschew counting years from formally-adopted events, be it historical or legendary.[8] Accordingly, there is no known initial epoch from which the years of the Somali calendar can be counted. It appears, however, that the calendar had been evolving over many centuries, if not thousands of years, largely due to the fact that it has been transmitted by oral tradition within vital usage and perpetual developments.

4.1. In Linguistics

If calendar is defined as grouping of days for conveniently keeping track of prioritized human activities, the proto Eastern Cushitcs had apparently practiced that idea according to the linguistic accounts. The Cushitic terms 'tiro' (count, reckon, number) and 'ammin' (hour, period), which make up the Somali term for 'calendar', are themselves several millennia-old for they came from proto Eastern Cushitic language. Tiro is a cognate word from the modern Eastern Cushitics notably the Macro-Somali, Afar, Oromo, Konso, Gawada, and Gobeze. Similarly, the word 'ammin' or 'amman' is shared by Macro-Somali, Oromo, Konso and Hadiya. The fact that the common ancestors of the Eastern Cushitics, who lived about six thousand years ago, used these terms indicates that they had to have a way to keep track of the time and a kind of calendar.

As another sign for this early, developed reckoning system, the proto Cushitic had generally shared most of the numerals including the higher ones such as 'Kum' (a thousand) and 'Shii'(a thousand or ten thousand). For instance, 'tamin' (ten) of Beja in north eastern Sudan , 'shii' of Agaw in north central

Ethiopia, and Kuma of Iraqwa in north central Tanzania,[9] are the toman, shii and kum in the Somali. As these four groups represent the Northern, Central, Southern, and Eeastern Cushitic respectively, the Somalis are the most easterly group of all Cushitics, who had begun to split 7,000 years ago.[10]

This interpretation is supported by a commonality between ancient Somalis and Egyptians. The Somali solar year consists of 365 days, which is similar to the ancient Egyptian calendar. Historians have observed a great deal of cultural and commercial links between the ancient Somalis and their Egyptian counterparts. These ancient peoples are even believed to be descended from common ancestry, at least partially.[11] As a result, cognates appear in astronomical terms as unequivocally shown by the key words in the following table

Table 5: Somali-Egyptian Astronomical Cognates

Somali	**Egyptian[12]**	**Arabic**	**English**
Qorrah or orra	Ra'a	Shams	Sun
Dayah	Ya'ah	Qamar	Moon
Jer	Ter	Waqti, Saa'ah	Hour, period
Manta, Malin	Manta	Nahar, Yawm	Day, today
Cawo or Caawa	Khawo	Layl	Night, tonight

In addition to few other terms, such as month and year, these words were the core of calendaric language of ancient societies around the world. On the bases of this shared background, it is highly probable that a common heritage had involved the foundations of the two calendric systems, the Somali and the Egyptian. Even with this possibility of common heritage, the Somali calendar appears to have developed indigenously.

4.2. In Archaeology

The antiquity and the originality of the Somali calendar is further supported by the belief that the ancient Eastern Cushitics, to which the Somalis belong, developed a sophisticated calendar based on detailed astronomical knowledge by the first millennium BCE (Before Common Era). Researchers have studied the archeo-astronomical nature of two megalithic sites on the southwest part of Lake Turkana, northwest of present Kenya.

The two megalithic sites are locally known as Namoratunga, meaning stone people. Researchers have

observed that one of the sites has an alignment of 19 basalt pillars seven of which are non-randomly oriented toward certain stars and constellations that are used by modern Eastern Cushitics 'to calculate an accurate calendar'.[13]

In addition to this field research, modern archeo-astronomical measures have been used in the study. It has found that the pre-historic Cushitics had been using an accurate, complex calendar system based on astronomical calculation at least twenty three centuries ago.

Namoratunga is located on the southern fringe of a region that was the ancestral home of pre-historic Somalis. The Macro-Somali groups of Rendille, Elmolo, Daasanac (Galab) and Arbore who have been in the area approximately three thousand years are still located very near to these archaeological sites. About four centuries ago when the Turkana and Samburu peoples expanded to the southern part of the lake, they came into contact with these Macro Somali groups,[14] while more Somalis were due east of them.15

More importantly, the ancient Somalis are known to be 'demolithic' (people of stone), who have been associated with tireless building of megaliths. This is shown by the tens of thousands of pre-Islamic-built cairns scattered throughout the Somali inhabited territories. The Cairns are known to the Somalis as Taallo Tiirriyaat (Monuments of Tiirri), or Arro-Weelo graves in some localities. Arro weelo, literally meaning ruler of the entire land, refers to a legendary queen in the Tiirri Era. Tirri was a powerful, ancient Somali tribe occupying the half of the contry including Harar uplands. The term 'tiir' itself means pillar, so tirri means pillar people.

During this same time, another major Somali tribe, Madalle, was craeting elaporate stone monuments in the far South (Jubba-Galana region: the vast land southeast of Lake Turkana to the Kismayo-Malindi coast). In addition to other complex earth works, such as flat dams, lime-stone built wells and ruined towns on the coast, the building of the Taallos is attributed to the Madalle-led ancient Somali communities in the region. Madalle literally means people of congregation, which also refers to power and hard work.[16] More interestingly, observations of bodies in cairns indicate similar burial practices indicating that they were built by same people.[17] However, as they were basically intended to be funeral, they are not related to astronomical phenomena as far as can be discerned.

The evidence suggests that one of the two calendars, Somali and Namoratunga, was the forerunner of the other because of a number of aspets: the Macro Somali groups had been the inhabitants of the region, during what linguistic historians now refer to as the 'Omo-Tana' era of Macro-Somali; the Somalis have the most detailed calendar among the Eastern Cushitics; they are builders of megalithic monuments or cairns; the timekeeping system based on 'seven' in the Somali culture is also found in Namoratunga, indicating Namoratunga's connection to the seven-based calendar system that produced the Somali calendar. The two systems, therefore, must be originated from a common cultural aspect or one of them must be derived from the other.

4.3. In Traditions

A timekeeping unit based on a week also indicates the antiquity of the calendar. The idea was introduced to different cultures in the world at different times. However, this concept was not common among the ancient or even pre-European-colonies of the world. The focus of the calendar of many of them was the lunar month, not the week. That was not the case for ancient Somalis.

Ancient Somalis gave special importance to the usage of the week in daily life. The present names of the week days in the Somali are Islamic (Arabic), but there is a sign for existence of week usage before the advent of Islam. Some traditional games retain what seem to be abandoned names, such as biito, hellelebi, laaqshow, tuux and taax, for the pre-Islamic weekdays. Besides these week-day names, other seven names were assigned to the timing of days in the week such as manta (today), berry (tomorrow), saakuun (after tomorrow), saandanbe (after after-tommorow), shaley (yesterday), dorraad (before yesterday) and dorraad-horteed (before before-yesterday). Moreover, less Islamized Macro-Somali member groups have preserved the pre-Islamic week, such as Rendille community whose homeland remains immediately northeast of Namoratunga sites. The names of the days of their week are as follows:

Table 6: Indigenous Week of Rendille[18]

The first day of the week	Hahat
” 2nd ” ”	Orra hakhan
” 3rd ” ”	Sere
” 4th ” ”	Kumat
” 5th ” ”	Sere hakhan
” 6th ” ”	Sere adhi (the day of sheep and goats)
” 7th ” ”	Sere gaal (the day of camel)

Thisindigenous week represents the pastoralist version that can be expected from ancient Somalis, and it is further evidence for the existence of pre-Islamic calendar. The seven-day week owes its origin to a reverence for the number seven in the religion of the prophets, the monotheistic messengers such as Noah and Abraham. For instance, seven days, seven heavens and seven earths, are found in the divine religions. In fact, as far as we know, the Israelites were the only people who were using a seven-day week prior to Christianity. All traditional societies, be they African, Asian, Middle Eastern or European, including Greeks and Romans, were using other intervals, that is from 4 to 10 days, or were counting months rather than days.[19]

Interestingly, it has been observed that the Babylonians attached significance to the number seven, and as a result, to the days of lunation that are multiplies of seven. The reason for this honor is unknown; however, it could have originated from previous divine beliefs, namely from the Prophet Noah's religious heritage.

The pre-Islamic Somalis, and other Eastern Cushitics, believed in a God named 'Waaq' or 'Eebe', who is the same as Allah or God in Islam and in the other monotheistic beliefs. It is clear that this heritage had come to the ancient Somalis in pre-historic times. Their calendar was, however, constructed for economical purposes rather than ideological concerns, another sign of its pre-Islamic characteristics.

Despite the Babylonian beliefs in the sacredness of the number seven, and Egyptian and later Persian calendars based on 12 months of 30 days plus five days, no calendar in the world has been organized like the Somali solar calendar. This idea could have come from the Egyptians, Babylonians or even Persians; however, there is no evidence for this observation. It remains very clear that the Somali's unique organization and method of calculation was undoubtedly developed in Somalia.

The nature of Dabshid celebration also supports the calendar's existence in prehistoric times. The festival activities, that take one to three days depending on the local customs, contain both Islamic and non-Islamic aspects. The activities include: building a huge fire; slaughtering animals, mostly goats; playing various games; singing obsolescent songs; and reciting Islamic prayers. The inclusion of non-Islamic customs in the present-day festivities suggests an attempt to preserve some of its pre-Islamic characteristics.

Heavenly-related customs also shed more light on this issue. In this regard, Dirir, Ayaan and Xiddig, have become strong icons in the general culture. Some economic or life events, such as one's fortune or birth, are marked by the movement of certain stars. The extended, common personal and place names by these terms across the nation[20] reflect the deep rootedness of these customs. Although some of these customs are not permitted in the Islamic faith, their persistence within the Islamic culture shows their importance in the daily life of pre-Islamic society, which in turn indicates the age of the calendar.

4.4. **In Records**

Finally, evidence in the Islamic era appears to show how old calendrical foundations have been transformed into the present, remarkably functioning Somali calendar. In his study in 1340s about the history of Awdal, the medieval state in western and northern parts of historical Somalia and some related areas, Al-Umari of Cairo states that in the land of Zayla' (Awdal) "they cultivate two times annually by seasonal rains … The rainfall for the winter is called 'Bil' and rainfall for the 'summer' is called 'Karam' in the language of the people of Zayla' [Awdali Somalis]."21

The author's description about seasons generally corresponds to the local seasons in historical Awdal where Karan or Karam is an important rainy season at the beginning of the year. The second half of the year is called 'Bilo Dirir', (bil = month; bilo = months). It appears that the historian was referring, in one

way or another, to these still used terms, Karan and Bil. This indicates that the ancient Somali solar calendar was very similar to the one they use today.

5. Conclusion

A narrative has been presented of solar Somali year that consists of 365 days, seven of which have 30 days while the rest are 31 days long. The cycle of the year is based on the cycle of the week. To create a detailed, accurate calendaric system that consist of various time units, different cycles such as the yearly cycle, are derived from the weekly cycle. This solar calendar is used for practical purposes like identification of the seasons. The accuracy of the calendar is proven in this paper with correlation to the Gregorian by calculations and by charts. Astronomical phenomena that prove that the operations of the solar year and lunar year are interconnected by lunation correlations with seasonal quarters or by an event called Dirir in which a certain star rises with a particular moon phase in half of the year are also addressed. Many indicative accounts strongly suggest that the usage of the calendar was begun in pre-historic times.

However, the calendar deserves much more research. Generally, the cycles of the calendars used today in the world are not exactly known and they are not absolutely constant. That should be the case for the Somali calendar as well. Modern calendars need to be synchronized with modern astronomical calculations. There is also a great sophistication in the science of establishing a unisolar correspondence within Dirir conjunction. Further, the Somali calendar is designed for economic needs: cultivation, pastoralist and maritime activities; but it has never been used for administrative purposes. There is much more research to be done concerning the variations of those economic activities.

The New Year Day may need to be adjusted by removing from around July 20th to the beginning of the month for administrative convenience. This kind of readjustment will not only make the course of the calendar closer to the Gregorian one, but, the beginning of the Somali summer and the Independence Days also fall on or around July 1st.[22] Such move, however, will require a consultation with traditional experts of the calendar. All these conditions warrant further research that will be discussed in upcoming articles.

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Notes

[1] Taqwiim is the Arabic term for 'calendar'. The word is a cognate from two languages, however. Shaped by morphological initiation, the Somali equivalent is qawimaat > qawimaad. For the etymology of 'amin-tiris', see section 4.1.

[2] During the first six decades of 20th century, dozens of scholars have studied the Somali calendar.

However, they have not adequately addressed all its calendric aspects such as the rules of the cycles, formulation and tabulation, see: Cerulli, Enrico, 1967, "Somalia, Scritti vari editi ed inediti", pp. 217-227: Lewis, I. M., 1955, "Peoples of the Horn of Africa: Somali, Afar and Saho", pp. 62-64. The late Musa Galal has done a research on this topic, though his study was not available for inclusion in this paper.

[3] There are about forty calendars used around the world today (L. E. Doggett, Calendars), including: Gregorian, Islamic, Chinese, Indian, Persian, Mayan; Arab, and Hebrew, the last two of which were based on the Babylonian Calendar. It must be noted here that there are also important, extinct calendars such as Egyptian, Babylonian, and Julian that are beyond the scope of this paper.

[4] A tropical year occurs when the day and night are approximately 12 hours each throughout the four seasons.

[5] The new year festival is called 'Istun' in some localized places such as the district of Afgoye, immediate west of Muqdisho.

[6] Traditionally, these solar periods might be called 'milay' rather than 'bil' because the term month is reserved for the synodic Lunar month. However, since the two systems operate separately, and seasonal periods are organized into months, they are reffered to here as months.

[7] Dirir-Sagaar or Dirir-Cawleed (The Dirir that the gazelle gives birth - Belittling). It is not usual to rain in Dirir Sagaar, but it may do so where the Gu rainfall was late. This is not applied to the NW and Banaadir coast since it is the period of Karan and Xagaayo for them respectively.

[8] L. E. Doggett, Calendars.
[9] Cushitic in Non-Semitic Languages of Ethiopia, edited by M.L. Bender, 1976.
[10] Christopher Ehret in the Non-Semitic languages of Ethiopia, Chapter 5 in Part 2, 1976.
[11] Author Weigall, A History of Pharaohs, 1925, V. I, 88, 91-3; Elliot Smith, The Ancient Egyptians and the Origin of Civilization, 1923, 81-2; James Breasted, A History of Egypt, 1924, 25-6; George Steindorff & Keith Seele, When Egypt Ruled the East, 1959, 101; Muxammad Cizah Duruuzah, Taariikhul Jinsil Carabiyyi, V. II, 37-8; Ali A. Hersi, 1977, "The Arab Factor In Somali History", pp. 49-63, 69-71.

[12] Gardiner, Alan, 1927, "Egyptian Grammer: Being an Introduction to the Study of Hieroglyphs".

[13] B. M. Lynch, L. H. Robbins: ''Namoratunga: The first Archeoastronomical evidence in Sub-Saharan Africa''.

[14] Thomas Spear, 1981, "Kenya's Past", p. 62.
15 Said M-Shidad Hussein, "Soomaaliya Dal iyo Dad"; Ali, Mohamed Nuh, 1985, "History of Horn of Africa".

[16] Said M-Shidad Hussein, Chap. Four.

[17] Chittick, N., 1992, "Cairns and other Drystone Monuments in Somali Regions"

[18] Fleming, 1964, Baiso and Rendille: Somali Outliers, p. 59, (q. C. W. Hobley, 1910).

[19] For example, days were grouped by Egyptians 10 day interval, Assyrians 5 days, west African tribes 4 days, Romans 8 days, central Asia 5 days.

[20] While there are many Somalis whose unrelated names are 'Dirir., the well known plases in that name include Dirir-Dhabe, a large city in the immediate NW of Harar which Non-Somalis call Dire Dawa, a European mispronunciation of Dirir-Dhabe.

22 Al-Umari, Ahmad Yahya, Masaalikul-Absaar fii Mamaalikil-Amsaar", ed., 1988, p. 48.

[22] In fact, there are three Somali independence days during the week ending July 1st: Northern Somalia, Southern Somalia, and Jabuti got their independence From Britain, Italy and France on June 26, 1960; July 1st, 1960; and June 27, 1977 respectively.

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