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# Study of Climate Determination Analysis Based On Pallontara / Papananrang and Rainfall Opportunities in Sidrap District

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# Study of Climate Determination Analysis Based On Pallontara/Papananrang and Rainfall Opportunities in Sidrap

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**Abstract**. Climate change is shown by the increasing imbalance in the amount of water in the dry season and rainy season. Thus, people experience water shortages in the dry season and floods in the rainy season, thus disrupting all schedules and cropping patterns which result in crop productivity decreasing until the harvest. Often the results of observations via satellite or meteorological instruments by the Agency for Meteorology and Geophysics are opposite in issuing a forecast of seasons with pallontara and papananrang in determining the weather / climate conditions that will occur. So that the results of these different forecasts can cause panic in planning agricultural development programs in the following year, no wonder the planning of agricultural development programs at the central level is often also out of sync especially in the timing (season) Estimates of the season that will occur in a year can be determined from the results of the scavenger gathering (meetings of civil servants, stake holders, researchers and universities). Specific objectives of the study to obtain a description of next year's climate forecast indicators are determined by several variables used pallontara and as a comparison analysis rainfall from several years. The results of the study that some indicators used by Pallontara in predicting climate are based on Islamic calendar, astronomical factors, behavior of organisms, observation of vegetation and observations of the moon. Whereas as a comparison used monthly rainfall data from several Sidrap Regency stations.

**Keyword**. Pallontara / Pananrang, climate

## 1. Introduction

Drought and flooding are two forms of natural disasters that quite often hit the agricultural sector in Indonesia. In extreme climatic conditions (years of El-Nino and La-Nina), the extent and intensity of agricultural land affected by the disaster increased sharply. Observations of El-Nino in 1994 and 1997 showed that the accumulation of rice fields that experienced drought from May to August exceeded 400 thousand ha while in normal years and La-Nina was less than 75 thousand ha. Furthermore, in La-Nina in 1995, accumulation of widespread flooding from October to December reached 250 thousand ha while in normal years and years El-Nino was generally less than 100 thousand ha [1]. Many climate experts look down on traditional climate or seasonal predictions, this is because traditional predictions do not use scientific methods and do not produce scientific reports. In addition, it does not make measurements with tools that are carried out regularly so that they can be repeated by others [2]. This happens because the observations they make are only based on animal behavior, the state of plants and using astrological observations.

The forecasting or forecasting practices of the season have long been carried out such as Pranata Mangsa on Java Island. Porhalaan in the Batak area, Lontara in South Sulawesi, Wariga in Bali and Nyali in East Flores. It is practiced by implicating the existence of public trust in the truth of the statements of smart people at that time. Observation methods do not use analytical methods so that they do not report in writing. However, their knowledge is collected from a hereditary experience, which is certainly a result of hereditary observations.

There is often a difference between the papayarang / pallontara and BMG in the estimated season. So that traditional forecasting (pallontara / papananrang) has the advantage that the forecasting model of human findings does not have an analytical and scientific method. Excellence is obtained from the ability of plants or animals to integrate all information obtained from the environment, into an information about the future conditions.

Climate forecasting in South Sulawesi has long been carried out since the government program namely Bimas on a large scale on a large scale to plant rice using fertilizing technology and superior seeds. With the support of the pallontara a "sipulung tudang" is held as a meeting place in determining the time to get down the rice fields and the planting schedule aims to avoid damage caused by plant pests and diseases, avoid excess water or lack of water so that rice production increases.

Ranging from descending to rice fields, plowing, until the time for harvest is over. There is an appalili ceremony before the land piracy. There is Appatinro pare or appabenni ase before rice seedlings are sown. This ritual is also commonly carried out when storing rice seedlings in a balla position, a special place located in the center of the house aimed at keeping no animal passing on it. Then the ritual was assembled with massureq, reading meong palo karallae, one of Lagaligo's epics about rice. And when the harvest arrived, a bokko coup was held, a harvest ritual which was usually accompanied by kelong pare. After going through a series of rituals, Mapadendang was implemented. In Sidrap and surrounding areas this ritual is known as appadekko, which means adengka ase lolo, the activity of pounding young rice. Appadekko and Mappadendang are said to have originated from this activity.

Papananrang from the Jeneponto area uses indicators about the layout and brightness of star sightings or star clusters. By looking at the culmination of two star clusters, namely lambarua and Mangiwanga, as an indicator of meeting two ocean currents that can cause large waves. It was different from what was done in Wajo District besides using 9 star clusters, also paying attention to the brightness of its.

### *1.1 Formulation of the Problem*

The older age of Pallontara / Papananrang which is one of the local wisdom that must be preserved, so that the extent of the results of observations and years of experience from pallontara / papananrang can be utilized and a comparison of the results of analysis of rainfall opportunities in determining the condition of rain that will occur. Scheduled patterns every year are carried out through scavenger gatherings by bringing together technicians, practitioners, researchers, BMG and universities to discuss season forecasts that will occur. Another section of your paper.

### *1.2 Research purposes*

This study aims to (1) increase the enthusiasm and participation of the pallontara / papananrang in determining season forecasts / predictions, (2) increase and carry out annual records of the occurrence of natural signs so that the quality of plants / trees in determining the forecast for the season will be more precisely so that it can be studied scientifically, (3) printing a new generation of young pallontara / papananrang that is more dynamic and able to combine traditional forecasting with modern, (4) determine the object of forecasting in a manner that is so that it is sharper in forecasting.

### *1.3 Expected output*

(1) Obtained the results of forecasting methods according to the conditions of the local area.
(2) A forecasting method that is more specific and sharp so that it can be used as input for the agro-complex sector.

(3) The passion for work is higher and directed so that regional assets can be preserved as a culture of South Sulawesi.
(4) New findings from the combination of traditional forecasting methods and modern forecasting methods based on scientific foundations.

## 2. Methods

### *2.1 Place and time*

The survey activity was carried out in Sidrap Regency, South Sulawesi Province. The location of the activity is the area where the success of the rice harvest in Sidenreng Rappang was due to the firmness of 'Nene Mallomo' in carrying out the law, this was seen in the culture of the local community in determining the planting period through TUDANG SIPULUNG (Tudang = Sit, Sipulung = Gathering or can be translated as a Great Deliberation) which was attended by Pallontara '(experts on Lontara books)), papananrang (experts in determining the season) and indigenous community leaders. The region has two peak rainfalls which are equatorial in December / January and April / May. Time of activity for 7 (seven) months or one planting season.

The materials used in this activity are: cameras, recording devices, computers as analysis tools using Excel programs and writing instruments.

The activity was carried out in the form of lectures, training and FGDs and evaluation of the climate prediction results of pontontara / papananrang. While as a comparison, secondary data was obtained from various Sidrap Meteorology / Climatology Stations, Maros Climatology Station and Tiroang TPH Station and data from PU Irrigation / PSDA. Secondary data in the form of rainfall data that occurs over 10 years, data is sampled from stations representing several sub-districts.

### *2.2 Extension method*

This counseling activity was carried out before tillage by involving members of the New TaniWala group as partners which included farmer owners and cultivators by including family members, stake holders and related agencies. The extension materials include:

a. How the participants can know that the plants are not independent of the influence of climate and the impact that will be caused.
b. How to use observational instruments for weather / climate elements and utilize these data as a comparison of traditional climate forecasting
c. How to avoid the effects of damage caused by the influence of extreme climates (floods, droughts and pests).
d. How to increase human resources (farmers) by changing the mindset of farmers from monoculture farming or just by using one variety every season to polyculture farming or the pattern of rotation of varieties, so that income from one commodity can be added from the crops.
e. Creating regeneration of pallontara / pananrang that is able to combine traditional climate predictions with modern climate predictions through the use of weather / climate data from the results of statistical analysis.

## 3. Results and Discussion

### *3.1 Traditional season forecast*

Climate forecasting / weather has actually been started since humans were able to see natural phenomena and connect them with animal behavior with certain weather events empirically. Since centuries ago people had assumed that if male wolves and donkeys often howled and shook their ears, goats and rams gore at each other, pigs snored and fidgeted all this was a sign of bad weather such as heavy rain accompanied by Guntur [3].

In the past three decades the climate in Indonesia has experienced a dynamic change. One of the conditions that can be felt is the increasing temperature and the increasing diversity of current climate patterns. Higher temperatures influence the continued increase in evaporation and evapotranspiration which leads to increasingly depleted water availability [4]. Climate change is also indicated by the

increasing imbalance in the amount of water in the dry season and the rainy season. Thus, people experience water shortages in the dry season and floods in the rainy season.

The occurrence of thousands of hectares of agricultural land due to the dry season. Paradoxically, on the affected land in December, January, February, March, there will be an overflow of water that is difficult to control. In fact, these two phenomena are natural phenomena at a reasonable level that come every year. If later irregularities arise, solely because of errors in handling, the greed of a few people in utilizing natural resources, mistakes using agricultural technology, and lack of knowledge [5].

Often the results of observations via satellite or meteorological instruments by the Agency for Meteorology and Geophysics are opposite in issuing a forecast of seasons with pallontara and pananrang in determining the weather / climate conditions that will occur. So that the results of these different forecasts can cause panic in planning agricultural development programs in the following year, no wonder the planning of agricultural development programs at the central level is often also out of sync especially in the timing (season) [2]. Estimated seasons in Sulawesi The South is determined by the results of the scavenger workshop (meetings of civil servants, stake holders, researchers and universities).

It must be admitted that our ancestors did not have analytical methods or written reports about the results of observations carried out every day. However, their knowledge is gathered from hereditary experiences and this is where the first step of knowledge at any time can be used as science to meet the tastes of the times by putting it on a solid foundation in the form of a critical and analytical approach.

In Lontara, many state indicators are taken from the location and brightness of star appearances or star clusters. For example papananrang from Jeneponto uses star clusters as sources of predictions such as lambarua, mangngiwanga, purung-purunga, pa'jekoa, janganga and balla keppanga.

The entire star cluster is a sign of carrying rainfall throughout the year, but is bound to the area where the star clusters are in their respective circular circles. The effect of rainfall can be seen when allimbang (crossing the kulaninasi point). Circulation of the star clusters together with the sun's path to the earth. Indicators of high rainfall that will occur at the time of allimbang and concurrent occurrence of Sa'ra (sinking of star clusters along with solar radiation in the west). The star groups that have the most rainfall are purung-purunga, pa'jekoa and janganga [6].

In Sidrap, a prominent Bugis intellectual figure lived during the Addatuang Sidenreng period and Addatuang Rappang (Addatuang = a kind of district government in the past) called 'Nene Mallomo'. He is not from the royal family, but his intelligence in state law and government makes his name quite famous. A legal order that is still perpetuated in Sidenreng, namely: Naiya Ade'e De'nakkeambo, de'to nakke'ana. (Translation: in fact the custom does not know the father and does not know the child). The wise word was issued by 'Nene Mallomo' when summoned by the King to decide the sentence to Nene Mallomo's son who stole the plow's neighbor's plow equipment. In Lontara 'La Toa, ene Nene Mallomo' is in line with other Bugis-Makassar figures, such as I Lagaligo, Puang Rimaggalatung, Kajao Laliddo, and so on. The rice harvest success in Sidenreng was due to the firmness of 'Nene Mallomo' in carrying out the law, this was seen in the culture of the local community in determining the planting period through deliberations called TUDANG SIPULUNG (Tudang = Seated, Sipulung = Gathering or can be translated as a Great Deliberation) by the Pallontara '(experts on Lontara books)), papananrang (experts in determining the season) and indigenous community leaders [7].

*3.2 Rain pattern analysis*

Based on Figure 1, the predicted rainfall that occurs from the results of statistical analysis shows that during the planting season October-March the peak of rain and its number experience a shift, namely in the last 5 and 7 years relatively the same, whereas the last 17 years there has been a decrease of only 100 mm per month. Conversely, in the April-September planting season all three did not change even though in the last 5 years the rainfall in June had decreased by 105 mm. Forecasts made by the pallontara said that the gadu planting season (April-September) in Dua PituE Subdistrict tends to be wetter so that pest attacks increase in intensity, so farmers are expected to prepare anticipation of control by planting resistant varieties, the timing of planting must be appropriate.

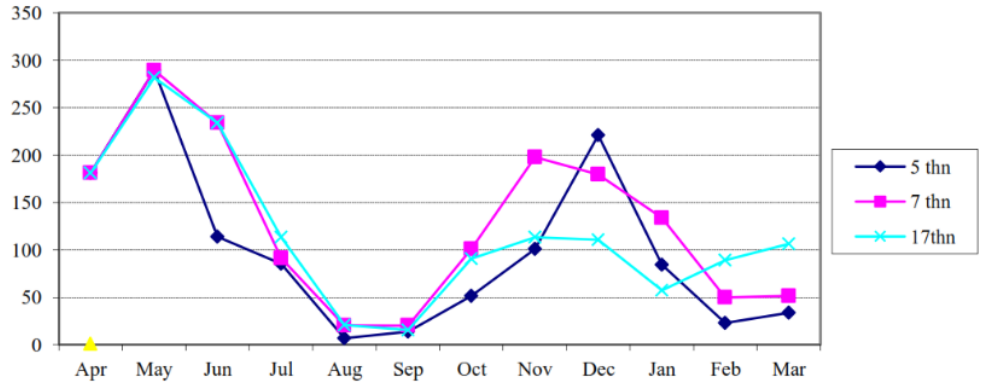


**Figure 1**. Rainfall distribution from TanruTedong Station at 5, 7 and 17 years Representing Two PituE Districts.

Based on the results of rainfall analysis in Figure 2, the pattern of rainfall in Baranti sub-district changes in patterns in the region in the last 5 years of the planting season from October to March the amount of rain is higher than the April-Sep planting season, whereas in the last 12 years relatively constant despite the amount of rain which occurs on average below 200 mm, so that conditions must be assisted by irrigation water to meet the water needs of rice plantations. According to the pallontara this region has changed due to the influence of Pinrang regency which blows east monsoon with relatively little water vapour.

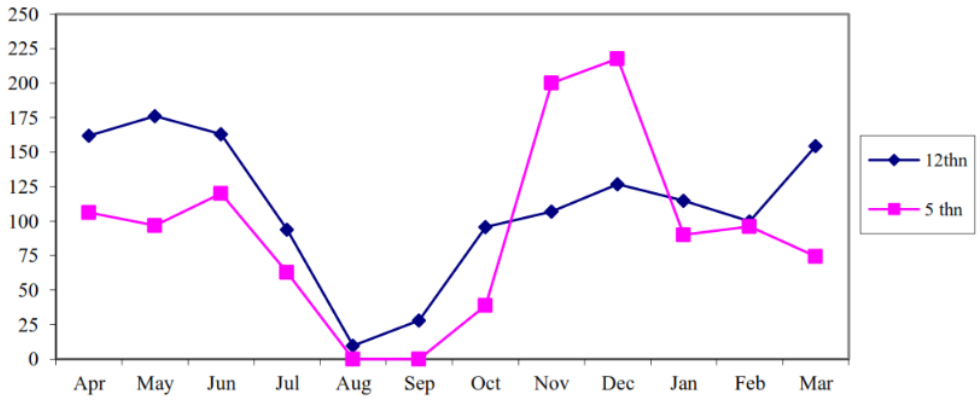


**Figure 2**. Rainfall distribution that occurs from Baranti 5 and 12 years Station Represent Baranti District.

The results of the rainfall analysis in the last 5 and 12 years in Figure 3 show that the area is relatively unchanged in the second planting season, except the peak of rain during the October-March planting season for the last 5 years the highest rainfall is reached at the end of the month and the dry season is more long from mid-July to mid-September and the rainfall distribution is relatively lower, while the last 12 years occur at the end of March and the lowest rainfall occurs only in September. Pallontara's prediction said that in this area it was relatively wet because it was influenced by Enrekang district which had a lot of Orographic rain.

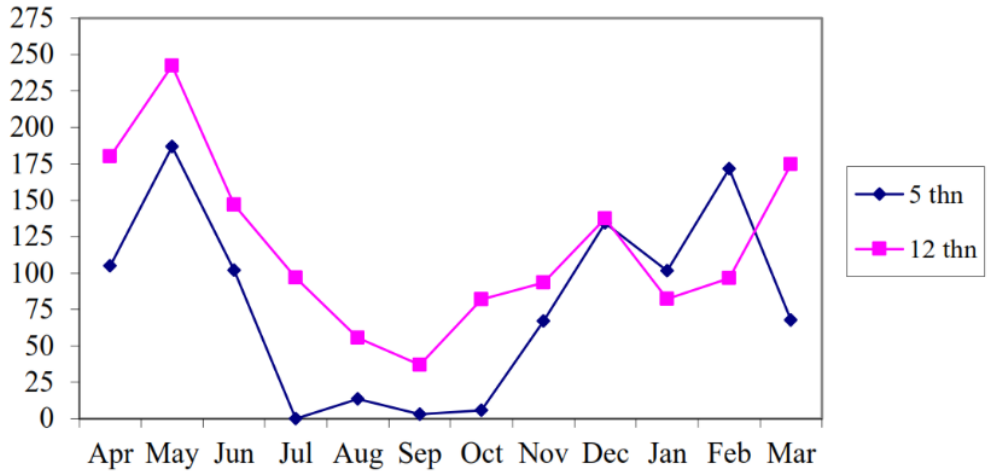


**Figure 3**. Rainfall distribution that occurs from Rappang Station 5 and 12 years Representing the Panca Rijang District.

The results of the analysis in Figure 4 show that in the MaritengngaE sub-district located in the center / district center the pattern of rainfall that occurred in the two planting seasons was relatively the same in the last 5 years and 12 years, except for the relatively higher rainfall intensity in the last 12 years but almost all months range below 200 mm per month. Based on the predictions of Pallontara.

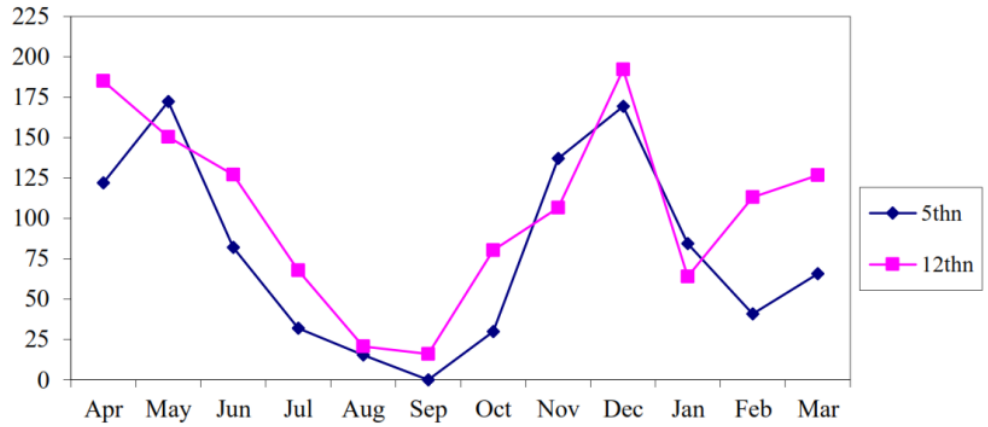


**Figure 4**. Distribution of rain that occurs from Sereang Station 5 and 12 years representing the MaritengngaE District.

The results of the analysis of rain patterns from the Panca Lautang sub-district are shown in Figure 5, that the two planting seasons April-September and October-March are relatively the same except that the rainfall intensity is relatively high in the last 12 years, even though the last 5-year rain peak occurred in March with 250 mm. In general, it shows that the rain that occurs on average is below 160 mm per month so it is expected that this region should be suitable for development only for crops. Based on the

pallontara prediction, the occurrence of rain followed the influence of Soppeng Regency where the rain that occurred was limited to soaking the soil.

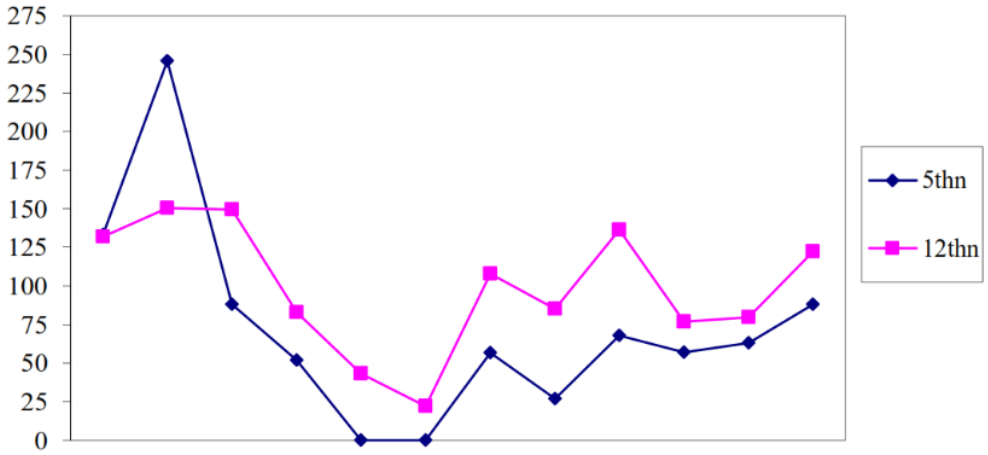


**Figure 5**. Distribution of rain that occurs from Bilokka Station 5 and 12 years.

Representing the Panca Lautang District stated that the rainfall pattern in this area was influenced by four adjacent territories, namely Pare-pare village, Soppeng regency, Wajo and Enrekang regencies, so that they received rain shipment from these regions.

Based on the results of the analysis of rain patterns in Figure 6, it shows that in this region the amount of rain that occurs in the planting season of October-March is relatively higher than the planting season from April to September. From July to October. According to Pallontara this region is strongly influenced by southeast Passat winds originating from Pare-pare.

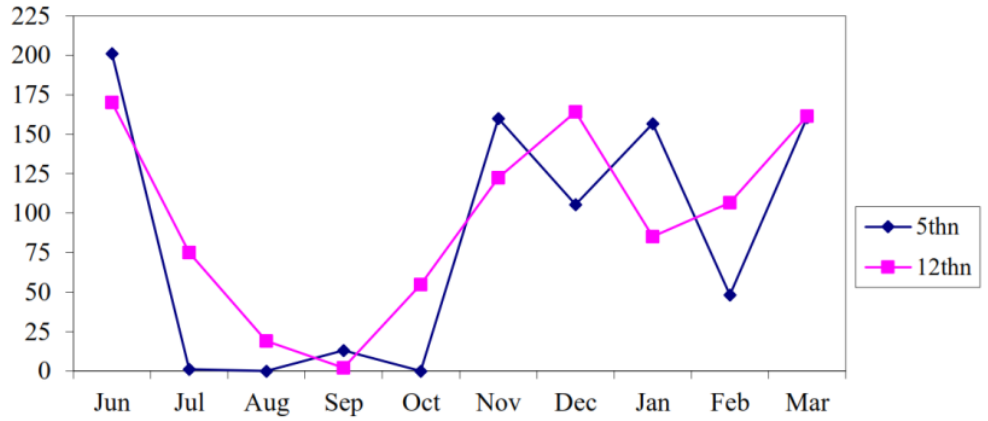


**Figure 6**. Distribution of rain that occurs from Lawawoi Station 5 and 12 years representing the Watang Pulu District.

## 4. Conclusions and Recommendations

*4.1 Conclusion*

a. Climate forecasting based on pallontara using the eight-year cycle indicator made every year with Islamic calendar (hijriah) with the formula of the hijri year reduced by two then divided by eight, the remainder of the year will be determined based on years starting from Alif to Dal.
b. Climate / rain forecasts with dates when the days of Muharram appear and natural conditions that occur up to three Muharram.
c. Climate / rain forecasts with indicators of insect behavior and plants are a sign of the arrival of the rainy season or dry season.
d. The results of rainfall analysis in Sidrap Regency in seven sub-districts, which experienced changes in the 2014 planting season occurred in the MaritengngaE sub-district, Panca Lautang and Lawawoi.

*4.2 Suggestions*

a. Research should be continued to obtain both qualitative and quantitative data using weather / climate observations, so that more scientific data can be obtained.
b. Research is needed on planting rice and secondary crops according to the planting time obtained both from pallontara and from the results of statistical analysis of rain distribution

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