



## A Review of The Sundanese Scale Theory

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### Abstract

This article aims to discuss Kusumadinata's scale theory in Sundanese music which has been taught in educational institutions in West Java, Indonesia. According to Kusumadinata's scale theory, *sorog* and *pelog* are scales derived from *salendro* scale in *gamelan salendro* performance. In my previous research, I investigated three genres of Sundanese performing arts which have existed since the Hindu era, namely *goong renteng*, *pantun*, and *tarawangsa*. The results indicate that the *pelog* scale has independently existed since the Hindu era. Then, I analyzed the phenomenon that occurs in the *gamelan salendro* performance, i.e., its melody (rebab and vocals) conventionally modulate into scale 'like *sorog*', occasionally into scale 'like *pelog*', whereas the instruments of *gamelan* are in the *salendro* scale. However, the analysis on the *sorog* in the previous research was not enough, so that in this paper, I will focus on the *sorog*. To find out the relationship between melody (vocal and rebab) and *gamelan* instruments, I examined the actual performances of *gamelan salendro* and *wayang golek purwa*. It became clear that the *salendro* scale derives four types of *sorog*. The findings of this study indicate that *sorog* has existed since the 19th century by this phenomenon, and the scale now called *sorog* is a scale derived from *salendro*.

**Keywords:** Sunda; sorog; vocal; rebab; gamelan salendro; wayang golek purwa

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### INTRODUCTION

One of the peculiarities of Sundanese music is the presence of a scale (*laras*) called *sorog*. In Javanese and Balinese music, only two types of *laras* are recognized, namely *slendro* and *pelog*, while in Sundanese music, there are three types of *laras*: *salendro*, *pelog*, and *sorog*. These three scales are all clearly pentatonic.

*Salendro* in Sunda is identical to *slendro* in Java. The main genre of the *salendro* scale in Sundanese music is *gamelan salendro*. But the pitch of Sundanese *gamelan salendro* is slightly lower than that of Javanese *gamelan slendro*, and the distance

between the five notes of the Sundanese *salendro* is more equal than that of the Javanese *slendro*. This can be clearly seen when comparing the finger position on rebab. Sundanese *salendro* (in *gamelan salendro*) is a bit difficult to transcribe with the diatonic tone, but when transcribed with the closest diatonic tone, D-E<sup>↑</sup>-G<sup>↓</sup>-A-B<sup>↑</sup>/C<sup>↓</sup>-D. Sign <sup>↑</sup> on the notes E and B means slightly lower than the E or B notes, sign <sup>↓</sup> on the note G and C means slightly lower than the G or C notes.

*Pelog* in Sunda is clearly pentatonic. (In schools, this scale is also called *degung*.) *Pelog* is the original scale of *gamelan degung*, a small gamelan that is unique to Sunda.

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Also *pelog* is the basic scale of *tembang Sunda Cianjuran*, a solo vocal music accompanied by *kacapi* (zithers). The Javanese *pelog* (in *gamelan pelog*) consists of seven tones, although only five notes are used in practice depending on *pathet*, hence Sundanese *pelog* is somewhat different from Javanese *pelog*. When transcribed with the closest diatonic tone, the Sundanese *pelog* is D-F<sup>#</sup>-G-A-C<sup>#</sup>-D. In order to make it easier to understand the difference with the *salendro*, here is also indicated from the D note. What needs to be considered is not the pitch but the distance between each of the five notes.

*Sorog* is typical of Sunda. (In schools, this scale is called *madenda*.) As William described, Sundanese people feel that the *sorog* is belongs to themselves which the Javanese don't have (William, 1990, p.69). In fact, this melancholy scale is very favored by Sundanese people. When transcribed with the closest diatonic tone, the *sorog* is D-E<sup>b</sup>-G-A-B<sup>b</sup>-D. In order to make it easier to understand the difference with the *salendro*, here is also indicated from the D note. What needs to be considered is not the pitch but the distance between each of the five notes.

Regarding these three scales, there is a theory taught at art college (STSI/ISBI) in Sunda, namely "*pelog* and *sorog* are scale that are born from *salendro* (from *gamelan salendro*)". The one who started this theory was Rd. Machjar Angga Kusumadinata (1902-1979).

Kusumadinata was the most influential figure in the Sundanese school environment. He coined a new term to be taught in schools. For example, the scale which is conventionally called '*sorog*' by Sundanese musicians, he calls it '*madenda*', and teaches it in schools. In 1923, he also created a solfa/cipher system which converts notes from 'high' to 'low' as 1/da-2/mi-3/na-4/ti-5/la, this system is still widely used in schools today (Zanten, 2014, p.209), even though in the field (outside of school) there are no musicians who mention tone like this.

In Kusumadinata's work, there are

many things that are not in accordance with the reality in practice, so that many foreign scholars have criticized Kusumadinata, such as Tamura (1977), Fryer (1989), Weintraub (1993, 1997), Sasaki (2006, 2007), and Zanten (1987, 1989, 1995, 2014).

Meanwhile, in Indonesia, especially in Sunda, no one has expressed criticism of Kusumadinata. Weintraub (1993, p.37) said that criticizing Kusumadinata is difficult for Sundanese scholars because they are 'insider' who live in Kusumadinata's own environment.

During the 20th century, the Kusumadinata's scale theory was never criticized nor reviewed by foreign scholars or by Sundanese/Indonesian scholars themselves.

It was only in the early 2000s that lecturer from the STSI (ISBI) Bandung appeared who reviewed the Kusumadinata's scale theory and dared to put forward criticism, namely Deni Hermawan and Heri Herdini. Their writing are, "*Tangga Nada Musik Sunda: Antara Kenyataan Teoretis dan Praktis*" (Hermawan, 2001) and "*Tinjauan Ulang terhadap Teori Laras dan Surupan Karya Raden Machyar Angga Kusumadinata*" (Herdini, 2004).

However, the method employed in their research was measuring 'number' (pitch and pitch interval) on *kacapi* tuning externally and mathematically. Because the measurement numbers (cents) by them do not match the numbers (cents) mentioned by Kusumadinata, it was concluded that "*degung* and *madenda* are independent scales, not derivatives of *salendro*" (Herdini, 2004, p.66).

Koizumi, who built scale theory of Japanese traditional music, study on tuning on 'musical instruments' by measuring cents externally, and mathematics is meaningless if you do not understand the musical structure first (Koizumi, 1958 p.25, p.245-246).

Likewise, the material taken in their research is *kacapi*, while Kusumadinata's scale theory is based on *gamelan salendro*. Therefore, the results of their research are inadequate as a result of a review of the

Kusumadinata's scale theory.

Concerning the emergence of 'Bandung scholars' who expressed criticism of Kusumadinata's scale theory in the early 2000s (i.e. Hermawan and Herdini), Zanten states "a necessary step towards developing a new modal theory for West Java", and "after discarding Kusumadinata's theories, scholars should develop a new modal theory" (Zanten, 2014, p.216-217).

However, after the emergence of the 'Bandung scholars' in the early 2000s, Kusumadinata's scale theory has never been reviewed by either 'insiders' or 'outsiders'.

The first author has been studying Sundanese *gamelan salendro* since 1998 and has researched Sundanese scales as a review of Kusumadinata's scale theory (Sasaki, 2006, 2007). This article is a continuation of the previous research.

To review the Kusumadinata's scale theory, what needs to be noted is, that the Sundanese *gamelan salendro* was originally a Javanese *gamelan slendro* brought from Central Java (Islamic Mataram Dynasty) in the 17th century, and in Sunda developed as the accompaniment of *wayang golek purwa*.

Therefore, the questions that need to be investigated are, (1) how is the scale of the ancient Sundanese music that existed in Sunda before the entry of *gamelan salendro* from Java (Islamic Mataram) in the 17th century? and (2) how to present the Sundanese *gamelan salendro* and *wayang golek purwa* can produce scales in the form of *pelog* and *sorog*?

To answer the first question, in previous research (Sasaki, 2006, 2007), the first author has investigated the scales on three types of ancient Sundanese music, namely *goong renteng*, *pantun*, and *tarawangsa*. *Goong renteng* is the oldest *gamelan* in West Java, which is the origin of *gamelan degung*. *Pantun* is an oral verbal tradition presented by a *juru pantun* while plucking *kacapi* all night long. (In the past it was often accompanied by *tarawangsa*). *Tarawangsa* is a two-stringed instrument, and its presentation is always accompanied by

*kacapi*. Existence *pantun* has been recorded in the Sundanese ancient manuscript *Siksa Kandang Karesian* written in 1518 AD, and it is considered that around 1400 the *pantun* had been known by the Sundanese (Sumardjo, 2003, p.5). *Tarawangsa* has also been referred to as a musical instrument in the Sundanese ancient manuscript *Sewaka Darma* written in the 15th century AD (Kurnia & Nalan, 2003, p. 31) that year the *tarawangsa* already existed.

The scale on *Goong Renteng* is *pelog* (five tone *pelog*). This is reasonable because, the scale of the *gamelan degung* which is said to be the development of *goong renteng*, is also clearly *pelog*. Also, *Pantun*, the original scale is *pelog* (five-tone *pelog*). As described by Weintraub (1990, p.66), since the early 1940s, for 'entertainment', the *kacapi* in the performance of *pantun* began to be tuned with *salendro*, but previously it was tuned with the *pelog*. This is also reasonable because the main scale of the *Tembang Sunda Cianjuran* which is a development of the *pantun* is also *pelog*. Regarding *tarawangsa*, the so-called 'principal pieces' or 'obligatory pieces' presented to invite and entertain Dewi Sri (Nyi Pohaci Sanghyang Asri) in 'sacred' agrarian ceremonies all in the *pelog* (five-tone *pelog*). *Salendro* scale only appears in several pieces which are presented as 'entertainment' after the sacred ceremony is over.

Therefore, regarding the first question, it has become clear that *pelog* in Sunda is an 'independent scale' that has existed since the Hindu era, long before the entry of *gamelan slendro* from Central Java, not a scale born from the *salendro*. Hence, as for the *pelog*, it can be said Kusumadinata's theory is not right.

Regarding the second question, the thing worth noting is, in the Sundanese music, especially in the *gamelan salendro* and *wayang golek purwa* performances, the vocalist and rebab player frequently uses tones which can not be produced on the fixed instruments, i.e. the *gamelan* instrument is in the *salendro* scale, but the melody (voice and *rebab*) can be 'like *sorog*', sometimes it can also be 'like *pelog*'.

Concerning this interesting phenomenon, the first author has tried to analyze in previous studies (Sasaki, 2006, 2007). However, in previous studies, the analysis of *sorog* was not enough. Also, previous studies' analysis was only about the *gamelan salendro*, whereas the Sundanese *gamelan salendro* developed as the accompaniment of the *wayang golek purwa*.

Therefore, in this article, both the *gamelan salendro* and the *wayang golek purwa* are analyzed, and the analysis focuses on the *sorog*.

## METHOD

The method used in this qualitative study is, descriptive analysis with a musicological approach.

Data is collected by participatory observation. The data needed in this study is the 'melody' performed by the *rebab* player and vocalist in the *gamelan salendro* and *wayang golek purwa* performances. To obtain data, what is needed is a study of the *gamelan salendro* practice including the accompaniment of *wayang golek purwa*, *rebab* practice, interviews with *gamelan salendro* experts and *dalang*, presentation observations, literature, recordings, both recorded by the author himself and those sold.

Regarding the practice of *gamelan salendro*, including the *wayang golek purwa*, and the practice of the *rebab*, the first author studies them both 'inside school' and 'outside school'. This aims to gain an objective view, since what is taught at school (STSI Bandung) with what musicians practice in the field is somewhat different.

Actually, at the STSI Bandung, the first author took courses on 'gamelan salendro/pelog' and 'wayang accompaniment'. In outside of school, the first author participated in the *gamelan salendro* practice which was held at the house of Asep Mulyana, a *rebab* expert. Also participates in *gamelan salendro* practice for *wayang golek purwa* at the house of Otong Rasta, the *dalang* of *wayang golek cepak/purwa*.

Especially about the *rebab*, the first author studied with experts through priva-

te lessons, such as Entis Sutisna and Uloh Abdullah. In this study, the practice of the *rebab* is more important than the practice of voice because the tone pitch can be seen clearly with the finger position.

In addition, the first author also interviewed the experts of *gamelan salendro* and the *dalang* of *wayang golek purwa*, namely: Iyar Wiarsih, Samin Batu, Tosin Muhtar, Dede Amung Sutarya, and Asep Sunandar Sunarya.

Besides, the first author observes various performances accompanied by *gamelan salendro*, both *tari* (dance) and *wayang golek purwa*. While observing, the author records so that it can be studied. The first author also collects many records that are sold, both *gamelan salendro* and *wayang golek purwa*. Literature, especially about *wayang golek purwa*, has also been collected, although it is not mentioned here one by one.

The results of the analysis are described using the Sundanese notation system, and transcribed in the closest diatonic tone in the Western music notation system. This paper uses the Sundanese notation system created by Kusumadinata, because most of the readers of this paper are familiar with the Kusumadinata's notation system.

In the concrete examples section, as a result of the analysis, transcriptions of the melody in the performances of *gamelan salendro* and *wayang golek purwa* with the closest notes in Western musical notation will be included.

## RESULTS AND DISCUSSION

### Phenomenon of Modulation

As already said, in the Sundanese music, especially in the *gamelan salendro* and *wayang golek purwa* performance, the voice and *rebab* frequently uses tones which can not be produced on the fixed instruments, i.e., the *gamelan* instrument is in the *salendro* scale, but the voice and *rebab* conventionally modulate into scale 'like *sorog*', sometimes it also modulate into scale 'like *pelog*'.

This is a very interesting phenome-

non unique to Sundanese music, but it seems that Sundanese themselves don't notice it. It was foreigners who analyzed this phenomenon.

Tamura (1977) has tried to analyze this phenomenon in *Ciawian* (songs of Ciawi). This phenomenon (only in the form of *sorog*) is also found in the performances of *Ciawian* accompanied by kacapi tuned with *salendro* scale. However, in principle the analysis is based on the theory and terminology of Kusumadinata (*Ilmu Seni Raras*), and the analysis results are not clearly explained. It seems that Tamura was 'confused' by Kusumadinata's theory and terms.

This phenomenon (only in the form of *sorog*) is also found in the performances of *Tembang Sunda Cianjuran* accompanied by kacapi tuned with *slanedro* scale, because of many of the *salendro* repertoires in the *tembang Sunda Cianjuran* are the repertoire of *gamelan salendro*. (For example, *Kulu-Kulu-Bem* transcribed in this artikel is one of the gamelan pieces sung as a repertoire of the *Tembang Sunda Cianjuran*.) This phenomenon in the *Tembang Sunda Cianjuran* has also been analyzed by Cook (1993). However, what Cook explains is that there are two types, namely what the first author calls Type A and Type B below.

#### Four Types of Modulation System as the Result of Analysis

The modulation system is as follows. The *salendro* scale of the instrument (gamelan) and scale 'like *sorog*' and 'like *pelog*' of the melody (vocals and rebab) share 'three tones' among the five tones of *salendro* scale. These three tones have important function in pieces as the framework, i.e. *gong* and *kenong*. Meanwhile, 'the other two tones' with no important function can be lowered or raised slightly, thereby modulating into scale 'like *sorog*' or 'like *pelog*'.

In previous research (Sasaki, 2006, 2007), as a result of the analysis of this phenomenon, the first author stated that there were three types of modulation systems.

However, upon review, it turns out that there are four types of modulation systems.

Before explaining the four types of modulation systems, the author will explain Figure 1. Figure 1 shows names and ciphers for the tones in Sundanese *gamelan salendro* on the image of *saron* (metallophone). The labels on the bottom parts are the closest tones in Western scales.

5 singgul	4 bem (galimer)	3 panelu	2 kenong (loloran)	1 barang (tugu)	5 singgul (petit)
B <sup>+</sup> / C <sub>↓</sub>	D	E <sup>+</sup>	G <sub>↓</sub>	A	B <sup>+</sup> / C <sub>↓</sub>

**Figure 1.** Names, ciphers, and pitches in Sundanese *gamelan salendro* (by Mariko Sasaki)

In the following, four types of modulation systems are described as Type A, Type B, Type C, and Type D. Each type is explained using an illustration of *saron*. 'The three unchanging tones' (that are 'shared') are not colored, while 'two tones that are lowered or raised slightly' are grayed out. In the cipher notation, the lowered tone is underlined, and the raised tone is upperlined.

The conventional modulation is in the form of *sorog*. In Type A and Type B, both *sorog* and *pelog* are found, while in Type C and Type D, only *sorog* is found (see Figure 2 to Figure 5).

[ Type A ]

- 'The three unchanging tones' (that are 'shared') are 1, 2, and 4.
- When tone 3 and 5 are lowered slightly, it modulates into *sorog*. (This type of *sorog* is called *sorog kenong* by traditional rebab players.) The pitch of this type of *sorog* is 4-3-2-1-5-4 = D-E<sup>b</sup>-G-A-B<sup>b</sup>-D.
- When tone 3 and 5 is raised slightly, it modulates into *pelog*. (This type of *pelog* is called *kobongan* or *mataraman*.) The pitch of this type of *pelog* is 4--2-1--4 = D-F<sup>#</sup>-G-A-C<sup>#</sup>-D.

sorog : 4-3-2-1-5-4 = D-E-G-A-B-D

kobongan/mataraman : 4-3-2-1-5-4 = D-F-G-A-C-D

Figure 2. Type A (sorog/pelog)

[ Type B ]

- ‘The three unchanging tones’ (that are ‘shared’) are 1, 3, and 4.
- When tone 2 and 5 are lowered slightly, it modulates into *sorog*. (This type of *sorog* is called *sorog panelu* by traditional rebab players.) The pitch of this type of *sorog* is 4-3-2-1-5-4 = D-E-F-A-B-D. If the tone sequence is changed, it becomes A-B-D-E-F-A.
- When tone 2 and 5 are raised slightly, it modulates into *pelog*. (This type of *pelog* is called *pelog degung*.) The pitch of this type of *pelog* is 4-3-2-1-5-4 = D-E-G-A-C-D. If the tone sequence is changed, it becomes A-C-D-E-G-A.

sorog : 4-3-2-1-5-4 = D-E-F-A-B-D

pelog degung : 4-3-2-1-5-4 = D-E-G-A-C-D

Figure 3. Type B (sorog/pelog)

[ Type C ]

- ‘The three unchanging tones’ (that are ‘shared’) are 1, 3, and 5.
- When tone 2 and 4 are lowered slightly, it modulates into *sorog*. (This type of *sorog* is called *sorog singgul* by traditional rebab players.) The pitch of this type of *sorog* is 4-3-2-1-5-4 = C-E-F-A-B-C. If the tone sequence is changed, it becomes E-F-A-B-C-E.

sorog : 4-3-2-1-5-4 = C-E-F-A-B-C

Figure 4. Type C (sorog)

[ Type D ]

- ‘The three unchanging tones’ (that are ‘shared’) are 2, 4, and 5.
- When tone 1 and 3 are lowered slightly, it modulates into *sorog*. The pitch of this type of *sorog* is 4-3-2-1-5-4 = D-E-G-A-C-D. If the tone sequence is changed, it becomes G-A-C-D-E-G.

sorog : 4-3-2-1-5-4 = D-E-G-A-C-D

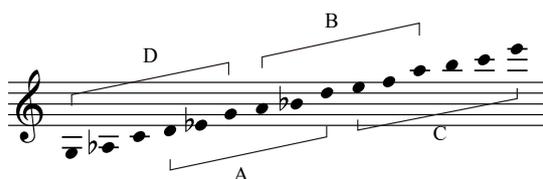
Figure 5. Type D (sorog)

### The Results of Analysis of the Four Types of Moduration

- The conventional (commonly found) modulation is in the form of *sorog*.
- In Type A and Type B, both *sorog* and *pelog* are found.
- In Type C and Type D, only *sorog* is found.
- The most conventional (commonly found) ones are only two types, namely Type A and Type B.
- As for *sorog*, a combination of Type A and Type B is common.
- Type C is rare, and is not found independently. Type C is only found in combination with Type B.
- Type D is only found in combination with Type A, and appears only when heading to tone 4. Therefore, Type D can be considered as part of Type A. (Hence, Type D is written as Type A/D.)
- If it is a combination, from Type A to Type B (or vice versa), and from Type B to Type C (or vice versa) frequently occur. However, the shift from Type A to Type C (or vice versa) always occurs via Type B.

### Four Types of *Sorog* as the Results of Analysis

As I mentioned above, conventional modulation is in the form of *sorog*, and there are four types of *sorog*. Figure 6 shows four types of *sorog* found in the vocals and rebab (transcribed by first author in the closest diatonic tone). As you can see, each type is overlapping, and the most conventional ones (i.e. Type A and Type B) are the center of four types.



**Figure 6.** Four types of *sorog* found in the vocals and rebab (Transcribed by Mariko Sasaki as Results of Analysis)

### Key Notes (1 and 4)

As previously explained, among the four types, the conventional (commonly found) modulation is only two types, namely Type A and Type B. This is indeed natural, because the rebab is tuned to tone 1 and 4. (In Type A and Type B, tone 1 and 4 are not changed.) It can be said that tones 1 and 4 are 'key notes'.

In fact, many of the *gamelan salendro* repertoires are based on tones 1 and 4. Also, the *dalang's* songs in the *wayang golek purwa* can be said that almost all end on tone 4 or 1. Hence in the *wayang golek purwa* performances, *saron* players often sound tone 1 and 4 so that the *dalang's* voice doesn't out of tune.

### Modulation in the Form of *Pelog*

As explained above, in Type A and Type B, both *sorog* and *pelog* are found. However, in practice, the form of '*salendro* with *pelog*' is rarely found. It is found only in newly composed pieces or as a variation (as an improvisation) in the performances of pieces whose original melody is *salendro* scale. Also, there are no 'classical pieces' whose original melody is *pelog* scale.

Therefore, it can be assumed that the modulation in the form of *pelog* is a new phenomenon. It is confirmed by *gamelan salendro* experts, namely Iyar Wiarsih, Samin Batu, Entis Sutisna, Tosin Muhtar, Asep Mulyana, and Uloh Abdullah. Likewise, the *dalang's* song in the *wayang golek purwa* performance, the modulation in the form of *pelog* is a new phenomenon. It is also confirmed by *dalang*, namely Dede Amung Sutarya and Asep Sunandar Sunarya.

### Modulation in the Form of *Sorog*

The conventional modulation is the form of *sorog*, both in the *gamelan salendro* performances and in the *wayang golek purwa* performances.

There are also several *sekar ageung* (big pieces which have 'finished melody') whose original melodies are totally in the *sorog*. For example, *Kulu-Kulu Bem*, *Tablo*, *Udan Mas*, *Banjar Sinom*, *Lara-Lara*, and so

on.

There are also several *sekar ageung* whose original melodies are *salendro* scale but conventionally altered into *sorog*. For example, *Kawitan* which is conventionally presented at the opening of the *wayang golek purwa* performance.

In the performance of *sekar alit* (small pieces which does not have 'finished melody'), if the *sinden* (female singer) and rebab players are willing and able, the melody can be spontaneously modified (improved) into *sorog*.

Several *sekar alit* have 'finished melody' conventionally, and the melody is *sorog*. For example, *Kulu-Kulu Gancang* which is usually served after *Kulu-Kulu Bem*.

### Concrete Examples

If the *dalang's* songs in *wayang golek purwa* are applied to the four types, it can be said that almost all is Type A and Type B. This is related to almost all *dalang's* songs end on tone 4 or tone 1.

If the *sekar alit* repertoires of *gamelan salendro* are applied to the four types, as follows. *Kulu-kulu gancang* (2④) and *Banjaran* (1②1④) is Type A. *Kulu-Kulu Barang* (4①) and *Sinyur* (1③1④) is Type B. In *Renggong Gancang* (2①3④), the first half is Type A, the second half is Type B. Likewise in *Sangga Gancang* (5①4③), the first half is Type C, the second half is Type B.

If the *sekar ageung* repertoires of *gamelan salendro* (whose original melody is totally *sorog*) are applied to the four types, as follows. *Kulu-Kulu Bem* and *Gawil* are Type A/D. *Tablo*, *Udan Mas*, and *Lara-Lara* are a combination of Type A/D, and Type B. *Banjar Sinom* is a combination of Type B and Type C.

The biggest pieces in the *gamelan salendro's* repertoires are the pieces conventionally presented at the opening of *wayang golek purwa*, namely *Kawitan*, *Bendra*, and *Sungsang*. The original melodies in these pieces are *salendro*, but there is already '*sorog* version', and in this '*sorog* version', four types all appear.

### 'Classic Pieces' in Sorog

Regarding *sekar ageung*, whose original melodies are totally in *sorog*, i.e. *Kulu-Kulu Bem*, *Tablo*, *Udan Mas*, and *Banjar Sinom*, the thing worth noting is that these pieces are 'classical pieces'. Therefore, it can be assumed that the modulation in the form of *sorog* is an old phenomenon. It is confirmed by *gamelan salendro* experts, namely Iyar Wiarsih, Samin Batu, Entis Sutisna, Tosin Muhtar, Asep Mulyana, and Uloh Abdullah.

As to when these 'classical pieces' exist, it is difficult to say for sure. But according to Lubis (Lubis, 1998, p.245), the regents of Cianjur liked *Kulu-Kulu Bem* as an accompaniment to *tayub*, hence it can be assumed that at least it has existed since the 19th century.

### Transcriptions of Melodies in Sorog

As a concrete example of melodies in *sorog*, the first author will attach the transcription.

The transcription 1 is *dalang's* song (*Kakawen Sendon/Sri Tinon*) sung by Asep Sunandar Sunarya, as an example of Type A.

The transcription 2 is the first *gongan* of *Kulu-Kulu Bem*, rebab by Uloh Abdullah, as an example of Type A/D. The transcription 3 is the first *gongan* of *Banjar Sinom*, rebab by Uloh Abdullah, as an example of a combination of Type B and Type C. These two pieces are 4 *wilet*. In the presentation of the pieces 4 *wilet*, each first line is sung by *alok* (male singer) with improvisation, after that from the second line, the 'finished melody' begins. Therefore, the transcription starts from the second line.

Regarding the transcription of *Kulu-Kulu Bem* and *Banjar Sinom*, there are things to note. In *senggol* (melodic ornaments performed by rebab player and vocalist), it also used tones that do not belong to each type described above. Hence, in the transcription, sometimes appear tones that do match the tones of each type described above.

Also, in the *senggol*, there is a tendency that 'when the melody goes up' with

'when the melody goes down', the pitch is slightly different. Concretely, in Type A, when the melody goes up, G-A-B<sup>b</sup>, but when the melody goes down, it tends to become B<sup>b</sup>-A<sup>b</sup>-G. Likewise in Type B, when the melody goes up, D-E↑-F, but when the melody goes down, it tends to become F-E<sup>b</sup>-D. Likewise in Type C, when the melody goes up, A-B-C, but when the melody goes down, it tends to become C-B<sup>b</sup>-A.

### Comparison with Kusumadinata's Scale Theory

As described in the Introduction, Kusumadinata's scale theory is "pelog and sorog are the scales born from *salendro* (from *gamelan salendro*)". The experiment conducted by Kusumadinata to draw the scale theory can be seen in *Ringkesan Pangawikan Rinenggaswara* (Kusumadinata, 1950) and *Ilmu Seni Laras* (Kusumadinata, 1969). *Ringkesan Pangawikan Rinenggaswara* may be considered as a summary of *Ilmu*

*Seni Laras*. *Ilmu Seni Laras* is still used as a course material in art education institutions, especially STSI (ISBI) Bandung and State Vocational High Schools (SMKN) 10 Bandung (Herdini, 2003).

What was being done by Kusumadinata to draw the scale theory was to develop the *salendro* scale as a *rakitan salendro* (*salendro* assembly). What is meant by '*rakitan salendro*' is, to insert a tone between the five tones of *salendro* by raising (*miringkan*) or lowering (*malangkan*) the five tones of *salendro*. Then, calculate the interval between the notes mathematically with cents.

As an experiment, in 1938, Kusumadinata made a '*rakitan salendro 10 raras*' by inserting five tones into the five tones of *salendro*. The distance between the ten tones on this model is 120 cents. Then in 1942, as a second trial, a '*rakitan salendro 15 raras*' was made by inserting ten tones. The distance between the 15 tones on this mo-

s ri ti non ing pa se wa kan bu sa na ma ne ka war na

bu sa na ma ne ka wa ma war na

s ri ti non ing pa se wa kan bu sa na ma ne ka war na

bu sa na ma ne ka wa r na

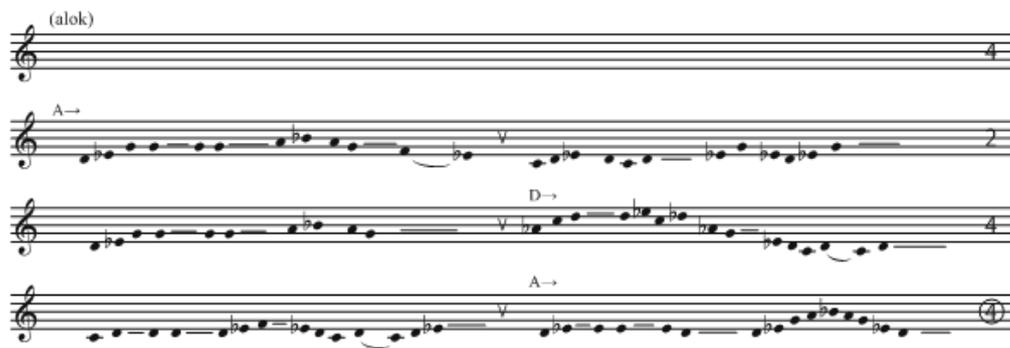
ser ba pus pi teng u di a na miang pan jra hing sar wa ruk ma

ya sar wa ruk ma

reng geng ma nik na ra wa ta na ra wa ta

### Transcription 1. Dalang's Song Kakawen Sendon (melody)/Sri Tinon (words)

Based on Vocal by Asep Sunandar Sunarya (Transcribed and Analyzed by Mariko Sasaki)



**Transcription 2.** The First Gongan of *Kulu-Kulu Bem* (*Sekar Ageung 4 wilet*)  
Based on Rebab by Uloh Abdullah (Transcribed and Analyzed by Mariko Sasaki)



**Transcription 3.** The First Gongan of *Banjar Sinom* (*Sekar Ageung 4 wilet*)  
Based on Rebab by Uloh Abdullah (Transcribed and Analyzed by Mariko Sasaki)

del is 80 cents. Finally, in 1945, the ‘*rakitan salendro 17 raras*’ was made by inserting 12 tones. The distance between the 17 tones on this model is 70 cents (Kusumadinata, 1969, p.27-38).

Kusumadinata’s scale theory is based on experimental results of ‘*rakitan salendro 15 raras*’. However, as Kusumadinata himself says (on page 32 in *Ilmu Seni Raras*), the reason for choosing ‘*rakitan salendro 15 raras*’ is, simply because ‘it feels better’ (*‘lebih enak*’) than ‘*rakitan salendro 10 raras*’. Thus, what Kusumadinata did to appeal to the scale theory was, just ‘calculate’ intervals mathematically and ‘choose’ with the reason of ‘feels better’.

Meanwhile, the first author analyzes ‘musical structure’ in the actual performances of gamelan salendro and wayang golek purwa, namely analysis the relationship between melody (vocal and rebab) gamelan instruments. Therefore, this study shows the real evidents in compare with

mathematical calculation developed by Kusumadinata.

### ‘Sorog’ in Japan

Japan is also one of the ‘members’ of the ‘pentatonic region’ of Asia. In this regard, there is an interesting point, namely that the three types of scales in Sundanese music are identical to scale (called *onkai*) in Japanese traditional music.

Concretely, the Sundanese *salendro* is identical to *ritsu onkai* in Japan, the Sundanese *pelog* is identical to *ryukyu onkai* found in the Ryukyu/Okinawa Islands in Japan. The Sundanese *sorog* is exactly the same as *miyakobushi onkai* in Japan. As is the case with *sorog* which is typical of Sunda, *miyakobushi onkai* is also typical of Japan.

According to Koizumi, Japanese ethnomusicologist, *miyakobushi onkai* is a mutation of *ritsu onkai*. The mutation occurred in the 17th century in the Edo pe-

riod (1603-1867), hence *miyakobushi onkai* is found in the music that developed during the Edo period, namely *koto (kacapi)* and *shamisen* (three-stringed stringed instruments). *Miyakobushi onkai* is also found in many folk songs. According to Koizumi, folk songs throughout Japan that were originally *ritsu onkai* have now almost all become *miyakobushi onkai* (Koizumi, 1958, p. 207 & 249, 1974, pp. 77-78).

Thus, in Japan, *miyakobushi onkai* (identical to *laras sorog*) was derived from *ritsu onkai* (identical to *laras salendro*). Is the *sorog* in Sunda also the same? Was *sorog* derived from *salendro*? If so, this means that the same phenomenon occurs horizontally in Japan and in Sunda/Indonesia. Hence, when this can be proven, it will contribute to the musicology, both in Japan and in Indonesia.

## CONCLUSION

As explained above, the presence of *pelog* as a modulation (i.e., Type A and Type B) in the melody (rebab and vocal) in the performances of *gamelan salendro* and *wayang golek purwa* is 'a new phenomenon'.

Also, the results of previous research on the three genres of ancient Sundanese music that have existed since the Hindu era show that the *pelog* is an independent scale that has existed since the Hindu era, long before the entry of the *gamelan slendro* from Central Java (Islamic Mataram Dynasty).

Therefore, with regard to *pelog*, it became clear that Kusumadinata's scale theory needs to be reconstructed.

Meanwhile, the presence of *sorog* as a modulation in the melody (rebab and vocal) in the performances of *gamelan salendro* and *wayang golek purwa* is 'an old phenomenon' that can be presumed already existed at least in the 19th century.

This indicate that the scale now called *sorog* in Sunda is a scale derived from *salendro* by this phenomenon in the performances of *gamelan salendro* and *wayang golek purwa*.

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