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# Morphophonemic Analysis on Postpositional Affixes in Kamano Language of Papua New Guinea: An Item and Process Approach

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## ABSTRACT

Kamano language, as one of the languages in Papua New Guinea, is considered as the pidgin language. This paper identifies the morphophonemic phenomena which occur in Kamano language by using the Item and Process model with suffix attachment to show the postpositional markers. This study uses descriptive qualitative as the approach to analyze Kamano language. The result shows that there are six phonological processes from seven morphological rules identified from the affix attachment. The phonological processes which occur are listed as follows; (1) the deletion of nasal sound [n]; (2) the substitution of glottal sound [ʔ] to the lateral sound [r]; (3) the deletion of vowel sound [a]; (4) the substitution of nasal sound [n] to the nasal sound [m]; (5) the substitution of plosive sound [t] to the lateral sound [r]. Furthermore, the phonological processes which occur mostly in this language are assimilation of place of articulation and manner of articulation.

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## 1. Introduction

Kamano language is listed as one of the languages existing in Papua New Guinea. This language is also called Kamano-Kafe or Kafe for short and is spoken by the inhabitants who live in East New Guinea Highlands (Ford, 2012). There are several previous studies that take Kamano-Kafe language as their subject but generally, they discuss the phonological process of the language.

As can be seen from Payne (1964) entitled *A Distribution Statement of Kamano Phonemes*, this paper presents the phonemes which exist in Kamano-Kafe language include the vowels, the consonants, the syllable patterns, and the distribution of the syllable in the sentence. Next, Ford (2012) highlights the information of the Kamano-Kafe language in phonological aspects. He also presents the lists of the vowels and consonants and the syllable patterns which occur in this language.

Next, Payne and Dorthy (2005) have compiled a dictionary that lists the lexical words which exist in Kamano-Kafe language. The dictionary explains the words in English to facilitate the English speakers who want to understand this tok pisin language. Ford (1993) has conducted preliminary research in comparing the languages existing in Papua New Guinea which includes the Kamano-Kafe language. He differentiates the language of *Kamano*, *Yate*, and *Yagaria*.

From the several previous studies that are presented before, mostly they only discuss the wordlist and the phonological process which occur in Kamano-Kafe language. As the morphological process has not been discussed yet in this language, the writers decided to identify the morphological process which occurs from the secondary data taken from *Laboratory Manual for Morphology and Syntax* (Merrifield, Naish, Rensch, & Story,

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2003). The data, somehow, have also the sound change process in the affixation which suggests the writers undergo the morphophonemic analysis. The additional reason for the writers to undergo the morphophonemic analysis on this language is that there has been no research or studies yet about the morphophonemic analysis which supports the novelty of this study.

A morphophonemic analysis is described as an analysis and classification where the phonological process affects the pronunciation of the morphemes or the morphological process such as affixation influences the sound change in the phonemes.

There are several studies on morphophonemic analysis as the main subject. The first study comes from Nigeria as Josiah & Udoudon (2012) compared the inflectional morphemes in English and Ibibio nouns using Contrastive Analysis (CA) focusing on the morphemes and the sound change occurred in both languages. Next, Nopriansah (2016) highlights the morphophonemic process of the English loan words in Searwai language. She points out three main findings which include the types of morphological processes, the types of morphophonemic processes, and the last, the formulas of the morphophonemic process in Serawai language.

The morphological process can be observed through two models, namely morpheme-based and word-based (Subiyanto, 2019). As these models see the data in different types of unit, the morpheme-based model can be identified from several approaches, they are, (1) Item and Arrangement, where the data of the language can be identified the marker and stem based on the arrangement of the stem and affixes in the word. In IA (Item and Arrangement) approach which is also known as the morpheme-based model, the concept focuses on the order of the morphemes. This type of approach is best to use for the agglutinative languages. (2) Item and Process, in this type of approach, the data have the sound change which occurs of the allomorph when there is an attachment of the morphemes to the stem (Blevins, 2006; Hockett, 1954; Katamba, 1993); and the last (3) Word and Paradigm identifies the data which have the complex sound change and morphological processes. Further investigation in Item and Process approach, Hockett (1954) explains that IP approach sees a word as a product of an operation that pairs a stem with a set of morphosyntactic features and changes its phonological form too (in Bonet, 2008).

In addition, Bram (2012), on his paper, presents the detail explanation about the three model of approaches to identify the morphological changes that occur in particular language. He stated that one should be able to identify the words whether or not they are attached the inflectional or derivative affixes. Then, one could advance to identify the morphological process that occurs in that language. Matthew (1998) mentions that IP (Item and Process) approach is better than IA (Item and Arrangement) approach. Regarding to this statement, Bram (2012) presents his exploration about the three approaches. He classifies IA as morpheme-based morphology, IP as lexeme-based morphology, and WP (Word and Paradigm) as word-based model (Haspelmath, 2001). Unfortunately, Bram only explores these three approaches in order to identify English words.

Generative phonology is proposed by Noam Chomsky in his book entitled *Syntactic Structure* (2002). Chomsky explains that there are three processes involved in order to form sentences and one of them is phonological process. Schane (1992: 51-62) asserts that phonological process is such a process where there is a change occurring in the language sound or phone influenced by some processes, namely, *assimilation*, *deletion*, *weakening* and *strengthening* in syllable structure, *neutralization*, and *metathesis*. The phonological process occurs when a particular sound is changed because of the influence of the neighboring sounds, whether it is preceded or followed by.

After identifying the phonological process, Schane (1992) adds that the linguists later will be able to create the phonological rules which occur on the phonological processes. The phonological rules can be formulated when the linguists are able to identify the requirement of the particular distribution so that the sound will change. The phenomena which can be identified to see the distribution include *segment deletion*, *segment addition*, *permutation*, *metathesis*, *feature change*, *assimilation*, *dissimilation*, and *coalescence*.

In feature change, each sound has distinctive features to be described. Yusuf (1998:7) states that phoneme is a representation of the group of distinctive features. Schane (1992) points out that distinctive features involve (1) the major class features (syllabic, sonorant, consonantal); (2) place of articulation (anterior, coronal); (3) manner of articulation (continuant, delay released, strident, nasal, lateral); (4) tongue position (high, low, back); (5) shape of lips (rounded); (6) additional (tense, voiced, aspirated, glottalization); and (7) prosodic (stressed and long). Distinctive features help to distinguish each phoneme from others and to describe the process which occurs on the sound change.

## 2. Research Methods

This study is a descriptive study that uses a qualitative approach. As this study is a morphophonemic analysis, the writers used the word list from Kamano language which has phonological process and the sound change occurring based on the morphological process which is specified in this study affix attachment. There are three stages which the writers use in this study, namely (1) collecting data; (2) analyzing data; and (3) concluding data.

In collecting data, the writers use secondary data taken from *Laboratory Manual for Morphology and Syntax* word list. The word list which is taken is *base*, *IT IS form*, *postpositional IN form*, and *postpositional ON form*, and *DUAL form*. Next in analyzing data, the writers classified the data systematically and identified based on the steps from Item and Process approach. Furthermore, since it is a morphophonemic analysis, the writers not only identify the morphological process which occurs and create the morphological rule for this language but also based on the phonological process which occurs and link the process with the distinctive features of generative phonology theory. Last, the writers conclude the data based on the analysis and the morphological and phonological process occurring in Kamano language, especially in affix attachment.

## 3. Results and Discussion

The data which the writers collected from *Laboratory Manual for Morphology and Syntax* word list consist of 16 nouns represented in Kamano language with five-word forms, namely, *base*, *IT IS form*, *postpositional IN form*, *postpositional ON form*, and *DUAL form*. The total number of words that are presented is 71 words. The words enlisted below.

Table 1. The list of words in Kamano language

No.	Meaning	Base	IT IS	IN	ON	DUAL
1.	'house'	No	nona	nompi	nonte?	nontere
2.	'my hand'	Naza	nazana	nazampi	nazante?	nazantere
3.	'water'	Ti	tina	timpi	tinte?	
4.	'bamboo'	Tfe	tfena	tfempi	tfente?	Tfentere
5.	'plaited wall'	Pra	prana	prampi	prante?	Prantere
6.	'pig'	afu?	afura	afu?pi	afu?te?	afu?tere
7.	'string'	nofi?	nofira	nofi?pi	nofi?te?	
8.	'man'	vhe?	vhera	vhe?pi	vhe?te?	vhe?tere
9.	'dog'	ma?ma?	ma?mara	ma?ma?pi	ma?ma?te?	ma?ma?tere
10.	'grass'	Hofa	hofa	hofafi	hofare?	
11.	'earth'	Mopa	mopa	mopafi	mopare?	
12.	'skirt'	Kena	kena	kenafi	kenare?	
13.	'sky'	Mona	mona	monafi	monare?	
14.	'rat'	Kfa	Kfa			Kfarere
15.	'bow'	Ati	Atia		atire?	Atirere
16.	'mist'	Hmpo	Hmpoa	hmpofi	hmpore?	

### 3.1. Determining the Underlying Form (UF) of words

The first thing to do before analyzing the Item and Process which occurs in Kamano language of Papua New Guinea word focusing on the postpositional form of nouns, we need to determine the underlying form of the data. As can be seen from table 1, the words varied from the base, so that determining the underlying form of the words should be conducted. The underlying form is the word which is neutralized from all the affixes attached and symbolized in between the slashes (/\_\_\_/). The base can be considered as the underlying form, but this is not always the case. There are some cases which the base cannot be considered as the underlying form. One of the reasons is the morphological rule which will be made will be really complicated if the base is used as the UF and attached the affixes.

In this data, the underlying form (UF) of the words are still not determined yet, even though the base list is presented. The determination of UF is based on the distribution of the data where the change of the sound occurs on the word house from *no*, *nona*, *nompi*, *nonte?*, and *nontere*. If the UF chosen is *no*, there would be too many morphological rules which should be made to fit the sound change according to the affix attached. For instance, *no* will be attached to the suffix [-na] to make the declarative form of the words for IT IS form. Next, the suffix [-mpi] will be attached to the base *no* to create the word to show the postpositional IN. The suffix [-nte?] is

attached to the base *no* to represent the word which shows the postpositional ON, and the last [-ntere] will be attached to the base to show the dual noun.

On the other hand, for the data ‘skirt’ and ‘sky’ where their bases are *kena* and *mona*, they do not have any affix attachment to the declarative form for IT IS but their form is still *kena* and *mona*. However, on the word list to show the postpositional IN, the forms change into *kenafi* and *monafi*. On the postpositional ON, the forms become *kenare?* and *monare?*. Furthermore, in the data ‘man’ where the base is *vhe?* is attached with the suffix presented, the represented form becomes *vhera* for IT IS form, *vhe?pi* for postpositional IN, *vhe?te?* for postpositional ON, and *vhe?tere* for DUAL form. The presented explanation shows that there are various sound changes in this language when it comes to the attachment of the postpositional affixes.

From the explanation, the writers create the illustration below. It can be seen from the illustration that there should be a rule and explanation which will show the change of the base to other forms.

Table 2. The illustration of the changes

House → <i>no</i>	/no + na/ →	/no + mpi/ →	/no + nte?/ →	/no + ntere/
Skirt → <i>kena</i>	/kena + ø/ →	/kena + fi/ →	/kena + re?/	
Sky → <i>mona</i>	/mona + ø/ →	/mona + fi/ →	/mona + re?/	
Man → <i>vhe?</i>	/vhe? + ra/ →	/vhe? + pi/ →	/vhe? + te?/ →	/vhe? + tere/

The first assumption which the writers propose is the base for several words which cannot be determined as the underlying form. The list of the words is *no*, *naza*, *ti*, *tfe*, and *pra*. The decision is made since they have various sounds changing into the other forms.

Second, the writers identify that there is always additional sound [n] after the base *no*, *naza*, *ti*, *tfe*, and *pra*. Then the suffixes follow them. There is a possibility that the underlying form of these bases is *non*, *nazan*, *tin*, *tfen*, and *pran*. If these underlying forms are applied, the morphological rules which will be made will not be too complicated and can be explained along with other types of words.

The third assumption is that the word list of base for *afu?*, *nofi?*, *vhe?*, *ma?ma?*, *hofa*, *mopa*, *kena*, *mona*, *kfa*, *ati*, and *mist* is considered as the underlying form since the distribution of the sound change occurs can be predicted.

Thus, the writers create a new list of the UF to make the morphological rule based on the Item and Process model.

Table 3. The list of underlying form (UF) of the Kamano language words

No	Meaning	Base	UF	No	Meaning	Base	UF
1.	‘house’	<i>no</i>	/non/	9.	‘dog’	<i>ma?ma?</i>	/ma?ma?/
2.	‘my hand’	<i>naza</i>	/nazan/	10.	‘grass’	<i>Hofa</i>	/hofa/
3.	‘water’	<i>ti</i>	/tin/	11.	‘earth’	<i>Mopa</i>	/mopa/
4.	‘bamboo’	<i>tfe</i>	/tfen/	12.	‘skirt’	<i>Kena</i>	/kena/
5.	‘plaited wall’	<i>pra</i>	/pran/	13.	‘sky’	<i>Mona</i>	/mona/
6.	‘pig’	<i>afu?</i>	/afu?/	14.	‘rat’	<i>Kfa</i>	/kfa/
7.	‘string’	<i>nofi?</i>	/nofi?/	15.	‘bow’	<i>Ati</i>	/ati/
8.	‘man’	<i>vhe?</i>	/vhe?/	16.	‘mist’	<i>Hmpo</i>	/hmpo/

### 3.2. Underlying forms of affixes

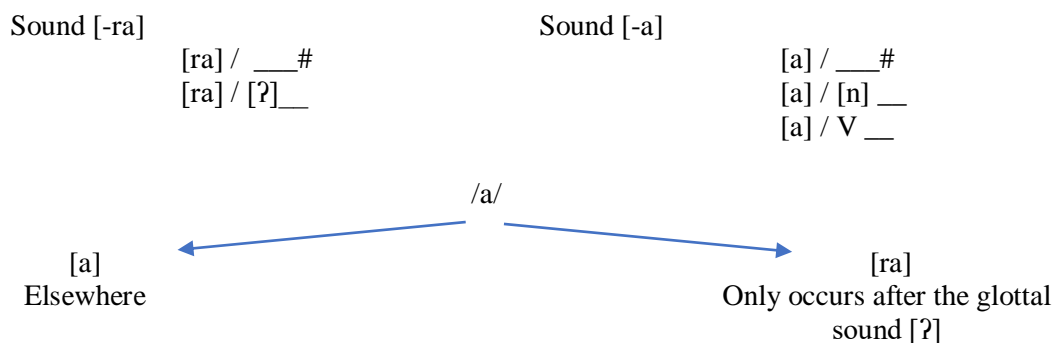
There are several affixes in Kamano language to form words into declarative forms IT IS, postpositional IN and ON, and DUAL forms. The affix used in this paper is categorized as suffix since the attachment occurs in the end part of the word. The affixes are listed as follows.

IT IS	[-ra] [-a]	IN	[-mpi] [-pi] [-fi]
ON	[-te?] [-re?]	DUAL	[-rere] [-tere]

Since there are several variations of suffix which occur in this language, the writers also should determine the underlying forms of these suffixes. The suffixes which will be determined involve IT IS, ON, IN and DUAL marker.

### 3.2.1 Underlying Form of postpositional IT IS marker

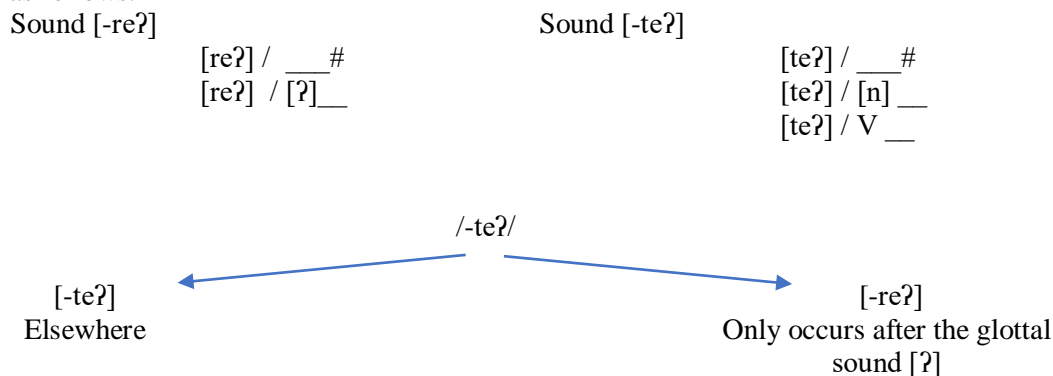
For the suffix of IT IS marker, there are two variations occur, they are [-ra] and [-a]. The distributions of the sounds are presented below.



By taking note of the underlying form of the words before, the distribution of suffix [-ra] only occurs when the UF of the words end with the sound [ʔ]. On the other hand, the distribution of the suffix [-a] occurs in various environments, where it occurs with the UF ends with vowels and the sound [n]. Thus, the writers decide that the underlying form of the suffix for IT IS marker is /-a/.

### 3.2.2 Underlying Form of postpositional ON marker

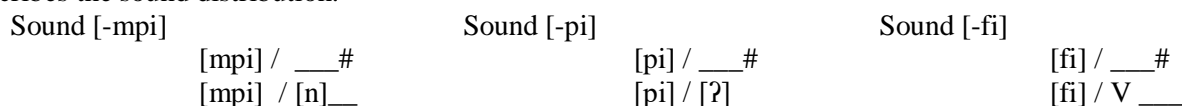
Next, for the suffix of ON marker, there are also two variations, [-teʔ] and [-reʔ]. The distribution is illustrated as follows.



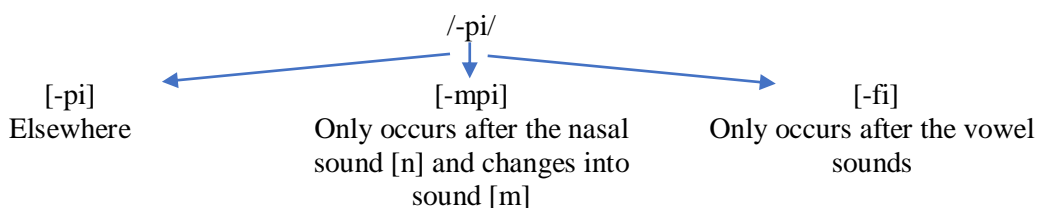
The suffix [-reʔ] occurs when the UF of the words ends with sound [ʔ]. Meanwhile, the suffix [-teʔ] occurs when the UF of the words end with vowels and sound [n]. Hence, the underlying form of the suffix of ON marker is /-teʔ/.

### 3.2.3 Underlying Form of postpositional IN marker

The IN marker suffix, there are three variations, namely, [-mpi], [-pi], and [-fi]. The following illustration describes the sound distribution.



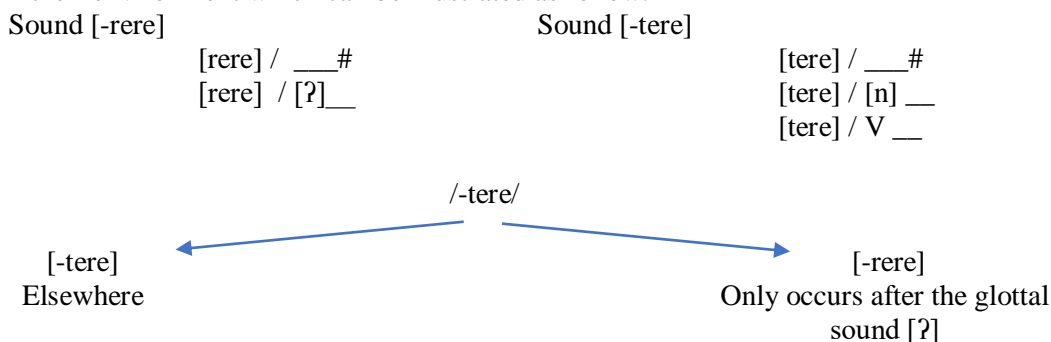
Each suffix occurs in different environments, as suffix [-mpi] occurs when the UF of the words end with sound [n], suffix [-pi] occurs when the UF ends with sound [ʔ], and suffix [-fi] occurs when the UF ends with vowels. There are two assumptions that the writers propose for this case.



The first assumption, the suffix [-mpi] is derived from the suffix [-pi] but the sound [m] occurs since there is an assimilation process of the sound [n] when it precedes the sound [p] from the suffix [-pi]. This assumption will generalize the morphological rule which will be made later, and it does not violate another rule. Second, the suffix [-fi] occurs when UF ends with vowels and does not occur in different environments. Thus, the writers determine [-pi] as the underlying form of the suffix of IN marker in this language.

### 3.2.4. Underlying Form of postpositional DUAL marker

The last suffix, the DUAL marker has two variations of [-tere] and [-rere]. The distribution of these variations differs from their environment which can be illustrated as follow.



[-rere] occurs only when it is attached to the stem which ends with vowels. On the other hand, suffix [-tere] occurs in elsewhere so that the writers determine /-tere/ as the underlying form of the DUAL marker. The list below is the underlying form of the suffixes.

Table 3. Lists of UF of the suffixes

Marker	Suffixes	UF	Marker	Suffixes	UF
IT IS	$\frac{[-ra]}{[-a]}$	→ /-a/	IN	$\frac{[-mpi]}{[-pi]} \rightarrow [-fi]$	/-pi/
ON	$\frac{[-reʔ]}{[-teʔ]}$	→ /-teʔ/	DUAL	$\frac{[-tere]}{[-rere]}$	/-tere/

### 3.3. Morphological rule

After determining the underlying forms for both the words list and the suffix of the Kamano language, the writers then propose the morphological rule in Item and Process model where the sound change occurs. There are several morphological rules which the writers propose namely (1) to form the base, (2) to form the declarative form (IT IS), (3) to form the postpositional word (IN), (4) to form the postpositional word (ON), and (5) to form the DUAL word.

#### 3.3.1. To form the base words

In Kamano language, the base words are words that are neutralized from the inflectional affixes. In this language, the stem of the underlying form which ends with the sound [n] cannot be considered as the base since Kamano language does not accept the base which ends with nasal sound [n]. The morphological rule below is illustrated.

/non/		[no]
/nazan/		[naza]
/tin/	→	[ti]
/tfen/		[tfe]
/pran/		[pra]

[n]	→	∅ / _____ #
+nasal +son +ant -cor		

From the illustration above, the sound [n] will be deleted on the stem of the underlying form if the stem has the sound [n] in the end of the word. Thus, the base is formed by deleting the nasal sound [n].

3.3.2. To make the declarative word 'IT IS' with the suffix /-a/

In order to make the declarative word, Kamano language has several variations in the sound change. But in this study, since the writers have determined the underlying form of the word, the UF should be attached with the suffix /-a/. In this declarative form, there are two variations occur in the sound change after the attachment of suffix /-a/.

a. The sound change occurs to the stem with underlying form ends with the sound [ʔ]

/afuʔ/		[afura]		
/nofiʔ/		[nofira]		
/vheʔ/	+	/-a/	→	[vhera]
/maʔmaʔ/		[maʔmara]		

[ʔ]	→	[r] / _____ [a]
+cons +son -ant -cor -cont	→	[+cont] / _____
		-high +low +back -round

When the underlying form (UF) or the stem end with the sound [ʔ], the sound [ʔ] changes into the sound [r] then the suffix [-a] is attached. The morphological rule illustrated above explains the sound change occurs to the underlying form which ends with the glottal sound [ʔ]. There is a phonological process that occurs in this case, which is the assimilation of manner of articulation. The glottal sound [ʔ] has distinctive features of [+cons], [+son], [-cont], [-ant], and [-cor]. Vowels have the characteristics of [+cont] where there is no obstruent occurs to create a stoppage so that the air can still go through. The characteristic of vowels influences the glottal sound [ʔ] so that it substitutes into the lateral sound [r] which has distinctive features [+cont].

b. The sound change occurs to the stem with underlying form ends with the sound [a]

/hofa/		[hofa]		
/mopa/		[mopa]		
/kena/	+	/-a/	→	[kena]
/mona/		[mona]		
/kfa/		[kfa]		

$$\begin{array}{l}
 [a] \\
 \left[ \begin{array}{l} -\mathbf{high} \\ +\mathbf{low} \\ +\mathbf{back} \\ -\mathbf{round} \end{array} \right]
 \end{array}
 \rightarrow
 \begin{array}{l}
 \emptyset / \text{_____} [a] \\
 \emptyset / \text{_____} \left[ \begin{array}{l} -\mathbf{high} \\ +\mathbf{low} \\ +\mathbf{back} \\ -\mathbf{round} \end{array} \right]
 \end{array}$$

As can be seen from the illustrated morphological rule above, the sound [a] will be deleted when the suffix for IT IS form /-a/ is attached to the stem which has underlying form ends with the sound [a]. The phonological process which occurs in this rule is apocope where there is an elision of the sound [a] at the end of the word. The writers assume that in this language, the complex structure of the identical vowels (VV) violates the rule of this language which leads to the deletion of one vowel.

3.3.3. To make the postpositional word 'IN' with the suffix /-pi/

There are two variations of the sound change in Kamano language when the suffix attachment of postpositional IN /-pi/ conducted. The details of the variations are explained below.

a. The sound change occurs to the underlying form ends with the sound [n]

$$\begin{array}{l}
 /non/ \\
 /nazan/ \\
 /tin/ \\
 /tfen/ \\
 /pran/
 \end{array}
 + \quad /-pi/ \quad \rightarrow \quad \begin{array}{l}
 [nompi] \\
 [nazampi] \\
 [timpi] \\
 [tfempi] \\
 [prampi]
 \end{array}$$
  

$$\begin{array}{l}
 [n] \\
 \left[ \begin{array}{l} +\mathbf{nasal} \\ +\mathbf{cor} \\ -\mathbf{ant} \end{array} \right]
 \end{array}
 \rightarrow
 \begin{array}{l}
 [m] / \text{_____} [p] \\
 [+ant] / \text{_____} \left[ \begin{array}{l} +\mathbf{cons} \\ -\mathbf{son} \\ +\mathbf{ant} \\ -\mathbf{cor} \\ -\mathbf{cont} \\ -\mathbf{voiced} \end{array} \right]
 \end{array}$$

When the stem ends with the sound [n], the sound [n] is changed into sound [m] when the suffix [-pi] is attached. The sound change occurs, according to phonological process which is recognized as the assimilation process of consonant and consonant. The assimilation in this case, is classified into the assimilation of place of articulation. Since the nasal sound of [n] has distinctive features of [+nasal], [+cor], and [-ant]. The sound [n] is influenced by the sound [p] from the suffix /-pi/ since the sound [p] has distinctive features of [+cons], [+ant], [-cor], [-son], [-cont], and [-voiced].

The sound [n] is influenced by the sound [p] from the [p]'s distinctive feature of anterior consonant. Where the place of articulation for anterior consonant occurs from the mid of the tongue to the front area includes lips (bilabial). Since sound [p] is bilabial consonant, the velar nasal [n] is influenced by the sound [p] and becomes the bilabial nasal [m]. Thus, the distinctive features of the sound [n], that is [-ant] is influenced by the sound [p] and changes into the distinctive features [+ant].

b. The sound change occurs to the underlying form ends with the vowel sound

$$\begin{array}{l}
 /hofa/ \\
 /mopa/ \\
 /kena/ \\
 /mona/ \\
 /hmpo/
 \end{array}
 + \quad /-pi/ \quad \rightarrow \quad \begin{array}{l}
 [hofafi] \\
 [mopafi] \\
 [kenafi] \\
 [monafi] \\
 [hmpofi]
 \end{array}$$
  

$$[p] \quad \rightarrow \quad [f] / V \text{_____}$$



$$\begin{bmatrix} +cons \\ -son \\ +ant \\ -cor \\ -cont \\ -voiced \end{bmatrix} \rightarrow [+cont]/ \begin{bmatrix} +syll \\ -cons \\ +cont \end{bmatrix} \text{---}$$

For the underlying forms which end with the vowel sounds in Kamano language, there is a sound change occurs. When the stem ends with vowels, the sound [p] in suffix [-pi] is changed into the sound [f]. In this case, the phonological process which occurs is assimilation of the *manner of articulation*. The distinctive features of vowel sound have [+cont] since vowel does not have any obstruent when it is being pronounced so that the air is still able to go through. The sound [p] in suffix /-pi/ has the distinctive features [+cons], [-son], [-cont], [+ant], [-cor], [-voiced]. The sound [p] is influenced by the characteristics of vowel, that is, the *manner of articulation* [cont] or continuant. The sound [p] which has distinctive feature [-cont] is changed into sound [f] which has distinctive features [+cont].

3.3.4. To make the postpositional form ‘ON’ with suffix /-te?/

/hofa/				[hofare?]
/mopa/				[mopare?]
/kena/				[kenare?]
/mona/	+	/-te?/	→	[monare?]
/ati/				[atire?]
/hmpo/				[hmpore?]

$$\begin{bmatrix} [t] \\ +cons \\ -son \\ +ant \\ +cor \\ -cont \\ -voiced \end{bmatrix} \rightarrow [r] / V \text{---}$$
  

$$\begin{bmatrix} +cons \\ -son \\ +ant \\ +cor \\ -cont \\ -voiced \end{bmatrix} \rightarrow [+cont]/ \begin{bmatrix} +syll \\ -cons \\ +cont \end{bmatrix} \text{---}$$

For the underlying forms which end with the vowel sounds in Kamano language, there is a sound change which occurs. When the suffix /-te?/ is attached to the stem which ends with vowels, the sound [t] in suffix /-te?/ is changed into the sound [r]. In this case, the phonological process which occurs is assimilation of the *manner of articulation*. The distinctive features of vowel sound have [+cont] since vowel does not have any obstruent when it is being pronounced so that the air is still able to go through. The sound [t] in suffix /-te?/ has the distinctive features [+cons], [-son], [-cont], [+ant], [+cor], [-voiced]. The sound [t] is influenced by the characteristics of vowel, that is, the *manner of articulation* [cont] or continuant. The sound [t] which has distinctive feature [-cont] is changed into sound [r] which has distinctive features [+cont].

3.3.5. To make the DUAL form with suffix /-tere/

/kfa/				[kfarere]
/ati/	+	/-tere/	→	[atirere]

$$[t] \rightarrow [r] / V \text{---}$$

$$\begin{bmatrix} +cons \\ -son \\ +ant \\ +cor \\ -cont \\ -voiced \end{bmatrix} \rightarrow [+cont] / \begin{bmatrix} +syll \\ -cons \\ +cont \end{bmatrix} \text{---}$$

For the underlying forms which end with the vowel sounds in Kamano language, there is a sound change which occurs. When the stem ends with the vowels is attached the suffix /-tere/, the sound [t] from the suffix /-tere/ will be changed into the sound [r]. In this case, the phonological process which occurs is assimilation of the *manner of articulation*. The distinctive features of vowel sound have [+cont] since the vowel does not have any obstruent when it is being pronounced so that the air is still able to go through. The sound [t] in suffix /-te?/ has the distinctive features [+cons], [-son], [-cont], [+ant], [+cor], [-voiced]. The sound [t] is influenced by the characteristics of the vowel, that is, the *manner of articulation* [cont] or continuant. The sound [t] which has distinctive feature [-cont] is changed into sound [f] which has distinctive features [+cont].

For the last two morphological rules presented, the writers assume that for the suffix which starts with the sound [t] is attached to the stem which has underlying form ends with the vowel sound. Then, the sound [t] will be changed into sound [r] because of the assimilation process where the distinctive features of vowel sound [+cont] influences the sound [t] which has distinctive feature [-cont].

#### 4. Conclusions

As can be seen from the presented explanation before, Kamano language, as the various languages existing in Papua New Guinea has a unique morphological rule where several languages use the position for the object as *prepositional*, this Kamano language uses *postpositional* form. Since, the postpositional is represented as suffix, not prefix. Furthermore, there is a regular distribution of sound change which occurs in Kamano language. From this study, the writers propose five morphological rules based on the Item and Process approach, namely, (1) the deletion of nasal sound [n]; (2) the substitution of glottal sound [ʔ] to the lateral sound [r]; (3) the deletion of vowel sound [a]; (4) the substitution of nasal sound [n] to the nasal sound [m]; (5) the substitution of plosive sound [t] to the lateral sound [r]. The phonological process occurs in this language mostly to the assimilation of place of articulation and manner of articulation.

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