

ナリク語の辞書作成の経過報告 NO.1
—ナリク語の数学—

クレイグ・フォルカー

**A Lingmaam 1: A Ikakating wan a ling a Nalik
Nalik Dictionary Project 1: Nalik Mathematics**

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概 要

著者は、目下、バプア・ニュー・ギニアのニュー・アイルランドで使用されているナリク語の最初の辞書を作成中である。本稿では、その辞書に記載する数学用語について論じる。今日、ナリク語の話者の間では、一般的に、トク・ピシン語に見られる英語の計算方が採用されている。一方、ナリク語に固有な計算法としては、現在も一部で使用されている5進法と10進法の混交計算法と、かつて、儀式に限定して使用されていた計算法がある。また、ナリク語で教育が行われるようになった現在、近代の数学概念を表す用語が新たに造り出されている。

Pan a doring angkare

A buk di wokpizin wan a ling a Nalik di varaal naambre. A varumarei ang a doring pan a ling a Nalik di varaal naambre, ka dodor wan a ikakating wan a ling a Nalik. Tanin a mun Nalik kavaras di giu a mun vakating sin a ling a mono, singsaxei xa roxin a zanun ikakating sin a Nalik nanga zaait. Naan a ikakating pan a vitmit ma a zangaafllu. Mumu xa roxin a zanun ikakating sin a maimaai xa ravarak. Kun aze nare di varumara a varaviraaing wan a funaliknaat pan a ling a Nalik, nare di waan famaravaas a ikakating ku tanin pan a ling a bina. Talaai di rexazing a ikakating pan a ling a bina.

Abstract

The first dictionary of the Nalik language of New Ireland, Papua New Guinea is currently being prepared. This first report of work in progress discusses Nalik mathematics terminology. Today most Naliks use English-Tok Pisin numbers, but there is also an indigenous counting system which uses a mixed base five and base ten system. In the past there was also a sacred counting system used for ceremonial purposes. With the introduction of vernacular education in Nalik, terms have been coined to express modern mathematical concepts.

1. Introduction

1.1. The Nalik language

The Nalik language is spoken on New Ireland, an island in the Bismarck Archipelago of northeastern Papua New Guinea (see Map 1 Nalik-speaking New Ireland). With a population of less than four million, Papua New Guinea has more separate languages than any other country, 849 (Grimes 1988: 688), so that each Papua New Guinean language has an average of about four thousand seven hundred speakers. According to data from the 1990 national census, between 3,500 and 4,300 people live in the area where Nalik is spoken (Papua New Guinea National Statistical Office 1992). Considerable numbers of Naliks live outside this area and many non-Naliks have moved into the Nalik area, but if this is taken as an approximate number of Nalik speakers, the Nalik-speaking community is about average in size when compared with other Papua New Guinean languages. New Ireland is a long island with a high mountain range separating the east and west coasts. Nalik is spoken in sixteen villages on both coasts. In the area where Nalik is spoken, the average width of the island is only about eleven kilometres and the Nalik-speaking “band” of the island is about thirty-five kilometres long. Nalik is bounded on the north by the Kara language and to the south by Kuot, the only non-Austronesian language on New Ireland.

Nalik belongs to the Oceanic branch of the Austronesian language family, a branch which includes most languages in the Bismarck Archipelago, many coastal New Guinea languages, and the indigenous languages of southern Melanesia, Fiji, and Polynesia. Within the Oceanic languages, Nalik is a member of the New Ireland-Tolai group of languages, which includes almost all the languages of New Ireland and most of the

languages of East New Britain (see Map 1 Languages of New Ireland and eastern New Britain). As Ross (1988) has shown, the New Ireland-Tolai languages most closely related to Nalik are the four languages to its north: Kara and Tigak on the New Ireland mainland, Tiang on Dyaul Island, and Lavongai (or Tungak) on Lavongai (or New Hanover) Island. These five languages are known as the Lavongai-Nalik language network.

There are four geographical dialects among the villages speaking Nalik proper: Southern East Coast, Northern East Coast, West Coast, and Laefu. Of the four the Northern East Coast dialect is most different from the other three, but there is only relatively minor variation among these geographical dialects. There is however considerable variation within each geographical dialect between speakers of different generations and with differing ties to traditional culture (see Volker 1994).

Between the villages which are clearly Kara and those which are clearly Nalik, there are the two west coast villages of Panemeka and Panagai and the east coast village of Lakuramau. While the speech of the eight hundred inhabitants of these villages is clearly closely related to Nalik, it is unintelligible to speakers of Nalik proper. Further research is needed to decide whether the speech of these villages should be regarded as a dialect (or dialects) of Nalik or a separate language (or languages). Because of the uncertain status of the speech of these villages, data from these villages have not been included in this study.

Nalik society is vigorously multilingual and there are no living monolingual Nalik speakers. Many persons have a knowledge of neighbouring languages and many older Naliks have a good command of the Kuanua language of the Tolai people of East New Britain, which was used for many years as a church lingua franca by the Methodist mission. All Nalik-speakers today have an active knowledge of Tok Pisin (New Guinea Pidgin English). Indeed, for many children Tok Pisin is the dominant language, even at home (see Volker 1993). Another language in increasing use is English. Today English-medium primary school education has become universal among Naliks and in a few ethnically mixed families English is a home language. Many innovative grammatical forms used by younger speakers show influence from Tok Pisin and, to a lesser extent, English (see Volker 1994:306-314).

1.2. The Nalik Dictionary Project.

Until recently Nalik has been poorly documented. Data from Nalik were included in several comparative works aimed at describing the relationships among various languages in the region, the most comprehensive of which was Ross(1988). Data from Nalik was also including in Lean’s(1985) comparative description of Papua New Guinean counting systems. The first attempt at a comprehensive description of Nalik grammar, however, was Volker(1994). In preparation for this, an orthography for Nalik was established(see Figure 1(Nalik orthography)), which was used in the first book published in the language, *Saaule Nakmai* (1991).

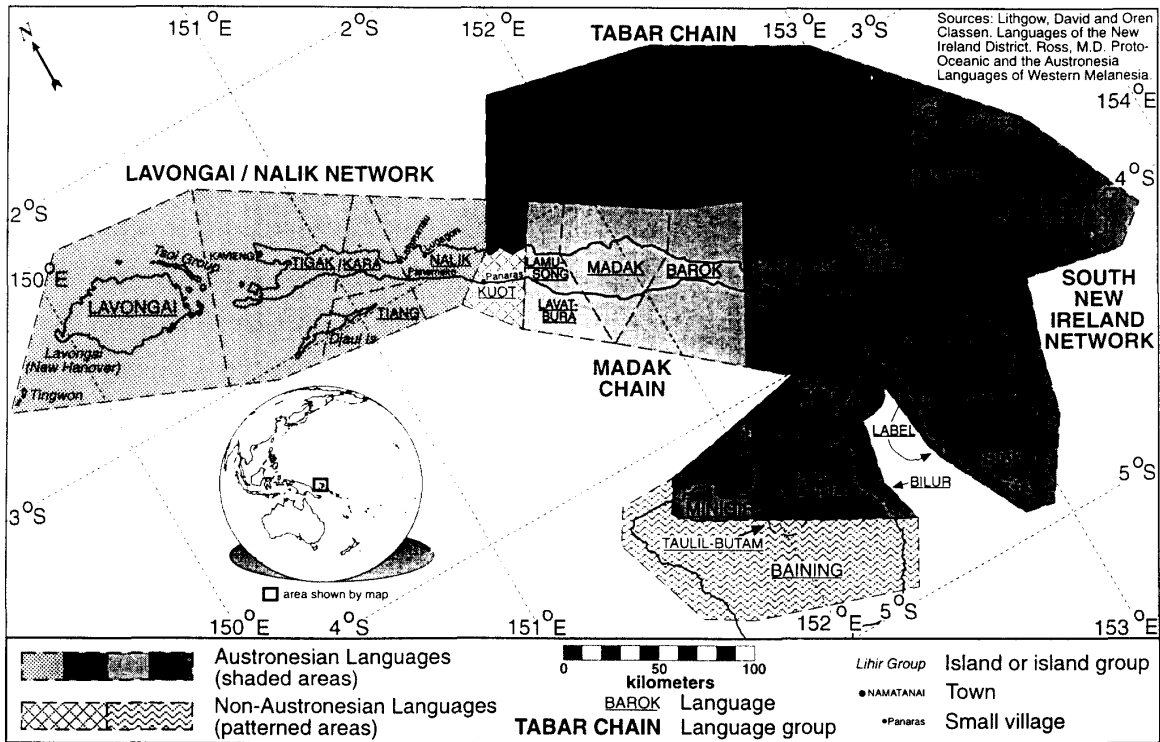
Consonants			Vowels		
p	-t	k	'	i	u
b	d	g		e	o
				a	aa
f	s				
v	z	x		ai	au
					ao
m	n	ng		ei	oi
				aau	
	l	r			
w	y				

v = /b/, x = /ɖ/, ng = /ŋ/, ' = /ɽ/

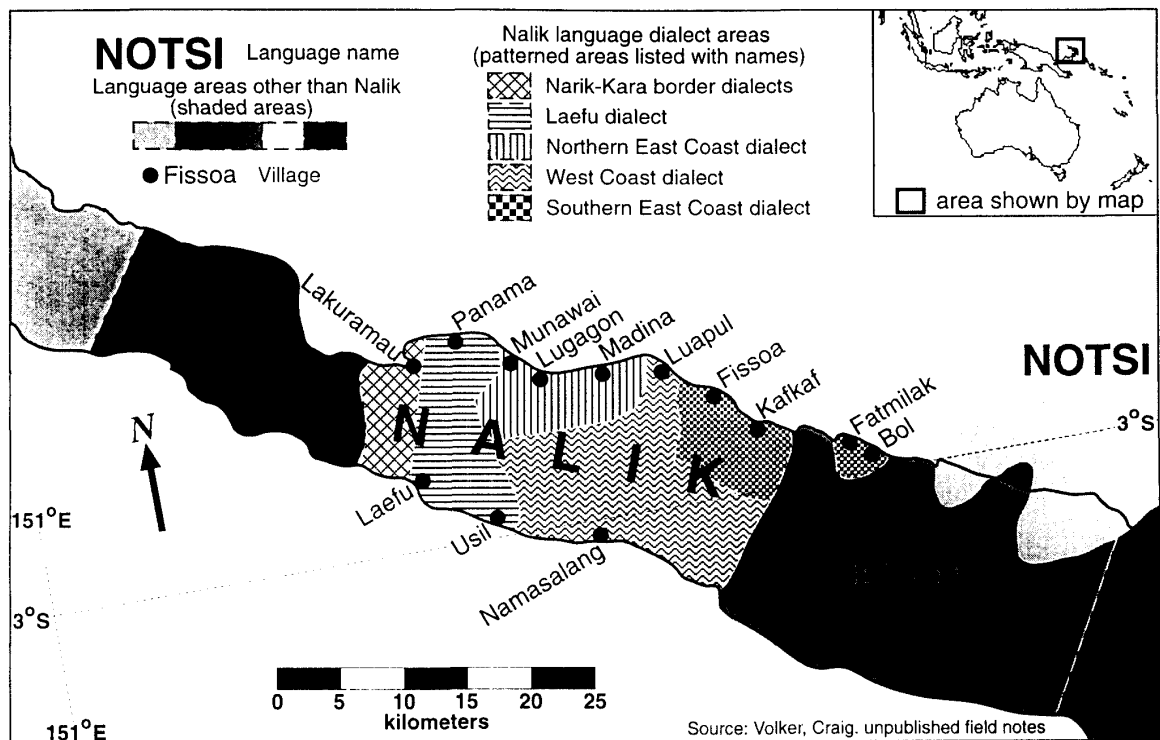
Figure 1. Nalik orthography

Under the Australian colonial government public schools were all English-medium. In recent years the New Ireland provincial government has begun changing the educational system so that communities may choose to have their children start their education in their own language before changing over to English. With the introduction of a Nalik orthography, materials for Nalik literacy classes have been written(Lawe 1990) and Nalik Language Schools for young children have been founded in several Nalik villages. Both because of this and because classical forms of Nalik are in danger of being lost, Nalik clan orators (*maimai*) have given their support to a long-term project to write the first Nalik dictionary.

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Map 1. Languages of New Ireland and eastern New Britain



Map 2. Nalik-Speaking New Ireland

1.3. Use of mathematical terms today

This first report of work in progress in the Nalik Dictionary Project discusses Nalik mathematical terms and includes a glossary of their English and Tok Pisin equivalents. Many of these terms are no longer in general use, particularly among children and young adults. Instead, most speakers today use Tok Pisin numerals (which differ only slightly from those in English) even when speaking in Nalik. Indeed, many younger speakers do not know any indigenous Nalik numbers above three. The main reason for this is that almost all younger persons have received their formal education in English-medium schools where much emphasis is placed on Western mathematics skills, and many have received little or no traditional education in Nalik. Moreover, Nalik terms for larger numerals can be rather long and cumbersome in comparison with their English/Tok Pisin equivalents, e.g., Nalik *ka zangaaflu vara zuai ma ka zangaaflu va ru ma zaxei xa lok uru* compared with English *two hundred twenty-one*. However, with the recent introduction of formal education in Nalik for younger children, there has been a renewed interest in expressing mathematical concepts using Nalik.

2. A vakating/Cardinal numbers

As Lean (1985:29-30) showed in his survey of New Ireland counting systems, Nalik, like the other Lavongai-Nalik languages, has a counting system with elements of both a base five and a base ten system. There are separate terms for the numbers one through five, as shown in Figure 2 (Numerals from one to five).

1	<i>azaxei</i>	
2	<i>uru</i>	(<i>urua</i> in the Southern East Coast and West Coast dialects)
3	<i>orol</i>	
4	<i>orolavaat</i>	(<i>urulavaat</i> for some speakers)
5	<i>kavitmit</i>	(<i>oplima</i> in the Southern East Coast dialect)

Figure 2. Numerals from one to five

The different Southern East Coast and Northern East Coast words for “five” are interesting. As in many Oceanic languages, the Southern East Coast dialect word for five, *oplima*, is a reflex of the Proto Oceanic word for “hand”, **lima*. The link between a hand with its five fingers and the numeral “five” is obvious. While the form of the Northern East Coast dialect word for “five”, *kavitmit*, is not related to the actual Proto

Oceanic word for“hand”, it is still related to the concept of“hand”; *mit* means“hand” while *kavit* means“no”, so that *kavitmit* can be analysed literally as“no hand”. This reflects New Ireland body language in which counting begins with an open hand. Beginning with the small finger, one finger is lowered for each number, so that to indicate “five” the hand is completely closed and there is literally “no hand”.

The terms used to count from six to nine are shown in Figure 3 (Numerals from six to nine). These are based on five, using *ka-vizik* “it goes down” plus a number from one to four. Again this reflects New Ireland body language as these numbers are five plus one to four additional fingers being lowered.

6	<i>ka-vizik-saxei</i>	(it goes down-one)
7	<i>ka-vizik-uru (a)</i>	(it goes down-two)
8	<i>ka-vizik-tal</i>	(it goes down-paucal)
9	<i>ka-vizik-faat</i>	(it goes down-four)

Figure 3. Numbers from six to nine

In counting, items are often counted in groups of eight, which are called a *viu* literally“dog”, e.g.,

- (1) *Ga roxin a yai a viu uru.*
 I have ART tree ART dog two
 “I have sixteen trees (two groups of eight)”

For numbers above ten it is also possible to use multiples of five, i.e., *kavitmit uru*“ten (two fives)” or *kavitmit orol* “fifteen (three fives)”. Normally, however, numbers above nine use a system based on multiples of ten, *sanaflu*. Multiples of ten are formed by using the pattern *ka* [it] + *zanaflu* [ten] + *va (ra)* [reciprocal marker] + a number from two to ninety, as shown in Figure 4 (Multiples of ten from ten to ninety).

10	<i>sanaflu</i>	
20	<i>sanaflu va (ra) uru(a)</i>	(10×2)
30	<i>sanaflu va (ra) orol</i>	(10×3)
40	<i>(ka) sanaflu vara lavaat</i>	(10×4)
	<i>(dizanaflu vara lavaat for some speakers)</i>	
50	<i>ka zanaflu va vitmit</i>	(10×5)
60	<i>ka zanaflu va viziksaxei</i>	(10×(5+1))
70	<i>ka zanaflu va vizikuru</i>	(10×(5+2))
80	<i>ka zanaflu va viziktal</i>	(10×(5+3))
90	<i>ka zanaflu va vizikfaat</i>	(10×(5+4))

Figure 4. Numbers in tens from ten to ninety

After the multiple of ten, units are indicated by using *ma* “and” together with the appropriate number, e.g., *ka zanaflu va vizikfaat ma orol* “ninety-three” (literally it is ten made nine and three’).

One hundred is formed using the same pattern with *zuai* “squared” indicating the multiple of ten, e.g.,

- (2) *ka zanaflu vara zuai*
it ten REC squared
“one hundred”

Multiples of one hundred are expressed with the appropriate number following the term for one hundred, e.g.,

- (3) *ka zanaflu vara zuai uru*
it ten REC squared two
“two hundred” (i.e., 100×2)

To express “one thousand” the phrase for “one hundred” is multiplied by ten again using *xa wut* “it comes to” together with the causative prefix *fa-* (or *pa-*) added to *lok* “to be present”:

- (4) *ka zangaaflu vara zuai ma xa wut pa-lok*
it ten REC squared and it come CAU-be.present
zangaaflu vara zuai
ten REC squared
“one thousand”

Another use of *lok* is with numbers greater than one hundred that also include units and multiples of ten. Here *ka lok* “it is present” is added before the multiplier, e.g.,

- (5) *ka zanaflu vara zuai ma ka zanaflu*
it ten REC squared and it ten
va ru ma zaxei xa lok uru
REC two and one it present two
“two hundred twenty-one” (i.e., $((102 \times 2) + (10 \times 2) + 1)$)

The use of such long and cumbersome numbers is undoubtedly a contributing reason why most Nalik speakers today prefer the Tok Pisin/English counting system with its much shorter expressions.

3. A *ikakating*/Ordinal numbers

Ordinal numbers can be formed in Nalik by affixing the causative prefix *fa-* and the transitive suffix *-ing* to the cardinal numbers described above. As with other words which permit the use of the prefix *fa-*, when a cardinal number begins with a vowel, that vowel is dropped, e.g., *faruing* “second” from *uru* “two” and *faroling* “third” from *orol* “three”. Today these ordinal numbers have been replaced by their English and Tok Pisin counterparts in the speech of most Nalik speakers.

4. A *ikakating sin a maimaai*/Sacred counting system

In addition to the ordinary system for counting things discussed above, clan leaders in the past used a special system for counting items used in a sacred context such as a *malagan* (final memorial) ceremony (see Figure 5 (Sacred counting system)). According to Nalik oral history, this sacred counting system was the original Nalik counting system, while the non-sacred counting system already discussed above is a relatively recent innovation that originated in Fissoa and gradually spread to other villages

because of events during a time in Nalik history when Fissoa was a dominant force in the area and many Fissoa families settled in other villages.

Today this sacred counting system has fallen into disuse and is unknown even to many clan leaders and orators. Those who still recall these numerals are unable to provide details of numbers above ten. The numbers from one to ten are shown in Figure 5 (Sacred counting system).

1	<i>hihep</i>	6	<i>dipiran</i>
2	<i>kimbo</i>	7	<i>wira</i>
3	<i>yaangi</i>	8	<i>kalangga</i>
4	<i>kapkap</i>	9	<i>ikula</i>
5	<i>pakaraat</i>	10	<i>lavaatazaar</i>

Figure 5. Sacred counting system

The most striking difference between this sacred counting system and the ordinary counting system is that numbers from six to nine are not bimorphemic words based on five. This makes it the only strictly base ten counting system reported for any northern New Ireland language.

This system also differs in that at least two of the numerals have marked intonation patterns. *Hihep* “one” is pronounced with a falling intonation on the first syllable, while both *hihep* and *lavaatazaar* “ten” must be pronounced with a rising intonation on the last syllable. These are the only recorded instances of individual words in Nalik requiring obligatory tone.

The sacred nature of these numerals is reflected in the fact that at least two are also nouns with a spiritual significance. *Kapkap* “four” is the name of a malagan symbol meaning “knowledge”, while *dipiran* “six” means “the Lord” (from *di* “great” and *piran* “leader”).

5. A ikakating sin a xulmu/Ancestral abstract counting system

Another numeral system no longer known by most Nalik speakers is a system once used for pure mathematics, i.e., for counting abstract numbers rather than actual physical items. The numerals used for the numerals from one to ten are shown in Figure 6 (Abstract numerals).

1	<i>saxe</i>	6	<i>isaxa</i>
2	<i>marua</i>	7	<i>sagurua</i>
3	<i>mangtal</i>	8	<i>singtal</i>
4	<i>mangfaat</i>	9	<i>singfaat</i>
5	<i>malima</i>	10	<i>sangaflu</i>

Figure 6. Abstract numerals

As with the cardinal numerals, the abstract numerals from six to nine are formed using a base five system. A base (*i-* or *si*) is followed by the last syllable of the abstract numerals for two to four. No living speakers seem to have knowledge of these abstract numerals above ten, so it is not possible to ascertain if abstract numbers larger than ten followed a base ten system as the cardinal numbers do.

6. A ikakating pan a gbal/Fractions

Although English expressions learnt in primary school are usually used today for fractions, some older speakers do remember an indigenous Nalik system. In this system “one half” is expressed by either *ta korovang* or *a gbal*, while other fractions are expressed by *a vang* “a part” followed by an appropriate number. Nalik expressions for fractions from one-half to one-tenth are shown in Figure 7 (Fractions).

<i>ta korovang</i> or <i>a gbal</i>	“one half’
<i>a vang kital</i>	“one-third’
<i>a vang talavaat</i>	“one fourth’
<i>a vang pitmit</i>	“one fifth’
<i>a vang piziksaxa</i>	“one sixth’
<i>a vang pizikuru</i>	“one seventh’
<i>a vang piziktul</i>	“one eighth’
<i>a vang pizikfaat</i>	“one ninth’
<i>a vang singaflu</i>	“one tenth’

Figure 7. Fractions

7. A ngava/Measurements

Nalik has a number of expressions used with or as units of measurement. In addition, several expressions have been recently coined as translations of modern units of measurement in the metric system.

In counting money the colloquial expression *a falusing* “covering” is used as an

equivalent of ten kina. This dates from the practice in the colonial period of paying workers with one hundred one shilling (today ten toea) coins wrapped together.

The international metric system of measurement is taught in primary school and today measurements are usually expressed with English or Tok Pisin expressions. Where the unit of measurement is known from context, the expression *braaving i pana* “the length of (it)” may be used, e.g.,

- (6) *a yarus a braav-ing i pan a orol*
 ART rope ART long-NOM DUR NTM ART three
 “a rope three (metres) long’

Several indigenous terms of measurement are also used. One is *raba vaal* “sago thatch section”. The length of one section of thatch sewn together can differ, but it is usually between one and two metres. The size of houses is often described in terms of *raba*, e.g.,

- (7) *Naan a raba faal uru wa-na.*
 it ART sago.thatch house two OBL-POSS:3SG
 “It’s two thatch sections big.”

Other traditional units are derived from a human body. Perhaps the most common is *ngavav*, the distance between a person’s outstretched hands. It is often translated as “fathom” and is equivalent to about two metres, e.g.,

- (8) *a ngavav azaxei*
 ART fathom one
 “one fathom”

In the example above the expression for “fathom” is a noun. But usually it is used as a verb “to measure the number of fathoms”. The numeral following the verb *ngavav* is made into a noun by the nominalising suffix *-ing* and incorporated into the verbal complex (i.e., it is not preceded by the article *a*) and often *ngavav* is shortened to *nguv*, e.g.,

- (9) *Azere braav-ing sin a xadio ?*
what long-NOM of ART bamboo
Ga nguv azaxei-ing be.
I measure.in.fathoms one-NOM only
“What’s the length of the bamboo ? ”
“I’ve measured it to be only one fathom long.”

Length can also be measured in terms of arm lengths, *mit*, e.g.,

- (10) *Naan a mit uru.*
it ART arm two
“It’s two arms long.”

Today *mit* has been suggested as an equivalent for “metre” in Nalik-medium schools, so that at least in a school context the example above could mean “It’s two metres long”.

In carpentry short lengths were traditionally described in terms of *mbele* “finger-widths” (literally, “spear”), e.g.,

- (11) *Naan a mbele orol.*
it ART spear three
“It’s three finger-widths long.”

Today *mbele*, which many young people today often pronounce as *mbala*, has been suggested as an equivalent for “centimetre” so that the example above could mean “it’s three centimetres long” in a school setting.

Traditionally, long distances were described in terms of *vi* “points of land”. This use is still heard in love songs. Today *vi* has been suggested as an equivalent for “kilometre”, e.g.,

- (12) *A lus l-a biru Lamakot wan Madina*
 ART measurement LOC-ART between L. OBL M.
a vi xa zangaafu va-ru.
 ART point 3 ten CAU-two
 “The distance between Lamakot and Madina is twenty kilometres.”

English	Nalik	Traditional or coined ?
centimetre,	<i>a mbele, a mbala</i>	coined (from “finger”, “spear”)
fathom	<i>a ngavav, ka nguv</i>	traditional
kilometre	<i>a vi</i>	coined (from “point of land”)
length	<i>a braaving i pan a</i>	traditional
metre,	<i>a mit</i>	coined (from “arm length”)
sago thatch section	<i>a raba faal</i>	traditional

Figure 8. Some expressions of length

8. A doring i wan a katfaraxumuling/Arithmetic terminology

Although expressions for mathematical functions existed in pre-contact Nalik society, abstract mathematics did not play the important role that it plays in today’s modern society. This, together with universal bilingualism and a century of education in other languages, has meant that Nalik people today do not normally express mathematic reasoning in their own language. Now that moves are underway to provide the first three years of formal education in Nalik, there is again a need for Nalik equivalents of basic mathematic functions. The following terms have been revived or coined by traditional Nalik leaders for use in vernacular schools.

In all mathematical operations, “equals” can be expressed either by *balis* “to become” or by adding the causative prefix *fa-* to *balos* “meet” while addition can be expressed by *ma* “and”, e.g.,

- (13) *Uru ma uru xa va-balos orolavaat.*
 two and two 3 CAU-meet four
 “Two plus two equals four.”

Subtraction can be expressed by *wakpizin* ‘throw away’, e.g.,

- (14) *Orolavaat ka wakpizin uru ka va-balos uru.*
 four 3 throw.away two 3 CAU-meet two
 “Four subtract two equals two.”

Multiplication can be expressed by affixing the causative prefix *fa-* and the nominalising suffix *-ing* to the multiplier, with the multiplied number expressed as the direct object of this nominalised verb, e.g.,

- (15) *Va-ru-ing oral ka balis kaviziksaxei.*
 CAU-two-TR three 3 become six
 “Two times three is six.”

Division can be expressed by *vatavaraking* ‘distribute, share’, e.g.,

- (16) *Uru xa vatavarak-ing xaviziksaxei ka va-balos orol.*
 two 3 distribute-TR six 3 CAU-meet three
 “Six divided by two equals three.”

English	Nalik	Literal meaning ?
divided by	<i>vatavaraking</i>	“distribute,share”
equals	<i>balis</i>	“to become”
multiplied by α	<i>fa-α-ing</i>	“make (it) α ”
plus	<i>ma</i>	“and”
subtract	<i>wakpizin</i>	“throw away”

Figure 9 Arithmetic terminology

9. A doring pan a ikakating Nalik-Inggris-Pisin Nalik-English-Tok Pisin glossary of terms related to mathematics

The following glossary follows the anticipated format of the Nalik Dictionary. Grammatical information, such as the part of speech of an entry, is written in small capitals, usually directly before or directly following the headword. Tok Pisin equivalents are in square brackets following the English equivalents. Examples of usage,

idioms, and derived forms follow the information given about the headword itself. Alphabetisation follows English and Tok Pisin conventions except in the following pairs of spellings caused by phonologically predictable alteration: **f/v**, **f/p**, **r/t**, and **x/k**. In these cases the word is listed under the first of the pair with the second pronunciation listed as an alternative (i.e., **xapkap** and **kapkap** are listed together under **xapkap** with **kapkap** as an alternate spelling and pronunciation).

a a, the [TP wanpela]

azaxei (*NUMBER*) one, a [TP wanpela]

(*KA*) **balis** (*NO DO*) **1. become** [TP kamap] ; **2. equals** [TP wokim] **Varuing oral ka balis kaviziksaxei.** Two times three equals six.

(*KA*) **balos** meet [TP bung] **fabalos/vabalos** equals [TP wokim] **Uru ma uru xa vabalos orolavaat.** Two plus two equals four.

braaf (*ADJ*) long; [TP long] (*NOM*) braaving length [TP long] **A zere braaving sin a xadio ? A braaving i pan a orol.** What's the length of the bamboo ? It's three (metres) long.

Dipiran -> **piran**

fa- a causative prefix. For words beginning with this prefix go to the next syllable, e.g., for **fabalos** go to **balos**. [TP Dispela i minim "mekim". Long painim hap tok i stat wantaim **fa-** yu mas lukim narapela hap bilong dispela tok. Olsem painim **fabalos** aninit long **balos**.]

(*A*) **falazing** 1. wrapper [TP karamap] ; 2. (*COLL*) ten kina [TP tenpela kina]

(*KA*) **fatarak/vatarak** (*NO DO*) split (up) [TP brukim] **Di na vaan fatarak ko.** We'll go our separate ways. **fatavaraking** divide, share, distribute [TP brukim] **Uru xa vatavaraking avaziksaxa ka vabalos orol.** Six divided by two equals three.

(A) **gbal** 1. half; 2. portion; [TP hap]

hihep (*SACRED NUMBER*) one [TP wanpela]

ikakating -> **kot**

ikula (*SACRED NUMBER*) nine [TP nain]

isaxa (*ABSTRACT NUMBER*) six [TP sikis]

kalangga (*SACRED NUMBER*) eight [TP et]

kakat -> **kot**

kavitmit ne/**oplima** se (*NUMBER*) five, group of five [TP faiv, faivpela samting wantaim] **kavitmit orol** three fives, fifteen; (**kavitmit** literally “no hand”; **oplima** from POC *lima “hand”)

kavizik- -> **vizik**

kimbo (*SACRED NUMBER*) two [TP tu(pela)]

(KA) **kot** 1. count [TP kaunim] ; 2. read [TP ritim] (*red*) **kakat** (*nom*)
ikakating 1. counting [TP kaunim]; 2. ordinal numbers [TP ol namba] **a ikakating sin a maimaai** sacred counting system [TP kaunim bilong ol maimai]
a ikakating sin a xulmu ancestral abstract counting system [TP kaunim o namba bilong ol tumbuna] **a ikakating pan a korovang** fractions [TP namba bilong brukim samting] **a doring ikakating** numbers used when counting [TP ol namba bilong kaunim] **a doring ikakating a zaan usfaa** numbers used to count things [TP ol namba bilong kaunim ol samting] (A) **vakating** cardinal numbers [TP ol namba] (A) **katfaraxumuling** mathematics [TP wok namba]

lavaatazaar (*SACRED NUMBER*) ten [TP ten]

- (A) **Lavu** ancestral home in the interior jungle [TP ples tumbuna long bikbus] **a doring Lavu** ancestral speech, classical Nalik [TP tok tumbuna bilong ol Nalik]
- (KA) **lok** (*NO DO*) to be present [TP i stap] **falok/palok** used in multiples of one hundred [TP hamas handret] **ka zangaafu vara zuai ma xa wut palok zangaafu vara zuai** two hundred
- (A) **lus** arm length [TP han] **Naan a lus uru**. It's two arms long.
- ma** (*CONJUNCTION*) 1. and; 2. plus; [TP na] **Uru ma uru xa vabalos orolavaat**. Two plus two equals four.
- malima** (*ABSTRACT NUMBER*) five [TP faiv]
- malimasiksaxa** (*ABSTRACT NUMBER*) six [TP sikis]
- mangfaat** (*ABSTRACT NUMBER*) four [TP fo]
- mangtal** (*ABSTRACT NUMBER*) three [TP tri]
- maurua** (*ABSTRACT NUMBER*) two [TP tu]
- (A) **mbele/mbala** (*YOUTH*) 1. spear, arrow [TP spia] ; 2. finger width, centimetre (*coined*) [TP pinga, sentimita] **Naan a mbele orol**. It's three centimetres long.
- (A) **mit** (*-NUM*) 1. hand [TP han] ; 2. half fathom, metre (*coined*) [TP mita] **A mit ka viziktul**. It's eight metres long.
- (KA) **ngav/nguv** (*YOUTH*) **to measure the number of fathoms** [TP mitaim namba bilong param] . The number following **ngav** has the suffix **-ing**: **Ga nguv azaxeing be**. I've measured it to be only one fathom long.

(A) **ngavav** fathom (the distance between a person's outstretched hands) [TP param]

a ngavav azaxei one fathom

oplima -> **kavitmit**

orol (*NUMBER*) **three** [TP tri]

faroling third [TP namba tri] . Same pattern used for all ordinal numbers: **fa-** + cardinal number + **-ing**

orolavaat (*NUMBER*) **four** [TP fo(pela)]

pakaraat (*SACRED NUMBER*) **five** [TP faiv]

(A) **piran/piraan** 1. great man, gentleman, leader [TP bikman]; 2. **Piran/Piraan** (*-NUM*) the Lord [TP Bikpela]

Dipiran (*-NUM*) 1. the Lord [TP Bikpela]; 2. **dipiran** (*SACRED NUMBER*) **six** [TP sikis]

(KA) **pizin** send (someone to do something) [TP salim (man long wokim samting)]

pizin a yai send someone to throw away sticks and branches (KA) **pukpizin/pakpizin** turn upside down [TP apim, kapsaitim] (KA) **wakpizin** 1. throw away, take away [TP tromwe, rausim] **Ga wakpizin a vanganing ka raksaat.**

I'll throw out the food that's spoiled.; 2. subtract [TP tekewe] **Orolavaat ka wakpizin uru ka vablos uru.** Four subtract two equals two.

(A) **raba** sago thatch [TP rup saksak] **rabafaal** sago thatch section between one and two metres long [TP lip saksak] (The size of houses is often described in terms of raba, e.g., **Naan a rabafaal uru wana.** It's two thatch sections big.)

sakare (*ABSTRACT NUMBER*) one [TP wan]

sanaaflu (*NUMBER*) ten [TP ten(pela)] . (Ka) **zanaflu va(ra)** unit of tens [TP namba i makim tenpela] :

sanafu varalavaat forty [TP fopela ten, foti]

sanafu varaorol thirty [TP tripela ten, tirti]

sanaflu vara'uru twenty [TP tupela ten, twenti]
ka zanaflu vavitmit fifty [TP faifpela ten, fifti]
ka zanaflu vavizikfaat ninety [TP nainpela ten, nainti]
ka zanaflu vaviziksaxei sixty [TP sikspela ten, siksti]
ka zanaflu vaviziktal eighty [TP etpela ten, eti]
ka zanaflu vavizikuru seventy [TP sevenpela ten, seventi]
ka zanaflu vara zuai hundred [TP handert] **ka zanaflu vara zuai uru**
 two hundred

sangaafllu (*ABSTRACT NUMBER*) **ten** [TP ten]

saxe (*ABSTRACT NUMBER*) **one** [TP wan]

sigurua (*ABSTRACT NUMBER*) **seven** [TP seven]

singaaflluvaaru (*ABSTRACT NUMBER*) **twenty** [TP tupela ten]

singfaat (*ABSTRACT NUMBER*) **nine** [TP nain]

sintal (*ABSTRACT NUMBER*) **eight** [TP et]

uru ne/urua se (*NUMBER*) **two** [TP tu(pela)]

faruing double, second [TP dabolim, tutaim] **Varuing oral ka**
balis kaviziksaxei. Two times three is six.

(A) **vang part** [TP hap] . Forms a fraction when followed by a number:

a vang kital one-third [TP i bruk long tripela hap]

a vang talavaat one-fourth [TP i bruk long fopela hap]

a vang pitmit one-fifth [TP i bruk long faivpela hap]

a vang piziksaxa one-sixth [TP i bruk long sikspela hap]

a vang pizikuru one-seventh [TP i bruk long sevenpela hap]

a vang piziktul one-eighth [TP i bruk long etpela hap]

a vang pizikfaat one-ninth [TP i bruk long nainpela hap]

a vang singaafllu one-tenth [TP i bruk long tenpela hap]

varazuai (*NUMBER*) **used to express multiples of one hundred** [TP *hamas handert*] :
ka zanaflu vara zuai one hundred

(A) **vi** 1. point of land, long distance [TP *poin*] 2. (coined) kilometre [TP *kilomita*]
A lus la biru Lemakot wan Madina a vi xa zangaafu varu. The distance between Lemakot and Madina is twenty kilometres.

(A) **viu** 1. dog [TP *dok*] 2. group of eight things [TP *etpela samting i bung*] **Ga roxin a yai a viu uru.** I have sixteen trees (two groups of eight).

(KA) **vizik** go down, descend [TP *go daun*]

kavizikfaat (*NUMBER*) nine [TP *nain*]; (literally “it goes down four’, a reference to the New Ireland way of counting by lowering one fingers)

kaviziksaxei (*NUMBER*) six [TP *sikis*]; (literally “it goes down one’)

kaviziktal (*NUMBER*) eight [TP *et(pela)*]; (literally “it goes down three’)

kavizikuru (*NE*)/**kavizikurua** (*SE*) (*NUMBER*) seven [TP *seven(pela)*]; (literally “it goes down two’)

wakpizin -> **pizin**

wira (*SACRED NUMBER*) seven [TP *seven*]

(KA) **wut** (*NO DO*) 1. come [TP *kam*]; 2. equals [TP *wokim*]

(A) **xapkap/kapkap** 1. malagan carving symbol symbolising wisdom [TP *mak bilong malagan i makim traipela save*] ; 2. (*SACRED NUMBER*) four [TP *fo(pela)*]

yaangi (*SACRED NUMBER*) **three** [TP *tri*]

9.1. A ling a Inglis ka plas favizik a ling a Nalik/English-Nalik finder list

The following finder lists are not complete English - Nalik or Tok Pisin - Nalik glossaries. They are only lists of the English and Tok Pisin equivalents of the Nalik words listed above. For detailed information about any Nalik entry, please refer to the appropriate entry above.

a **azaxei**

abstract counting system (ancestral) a **ikakating sin a xulmu**

ancestral home **Lavu**

ancestral speech a **doring Lavu**

ancestor **xulmu**

and **ma**

arm, arm length **lus**

arrow **mbele**

become **balis**

cardinal numbers **vakating**

centimetre **mbele**

classical Nalik a **doring Lavu**

come **wut**

count **kot**

counting **ikakating**

distance, great **vi**

distribute **fatavaraking**

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divide **fatavaraking**

dog **viu**

double **faruing** (-> **uru**)

eight **kalangga, kaviziktal** (-> **vizik**), **sintal, viu**

eighty **ka zanaflu vaviziktal** (-> **sanaaflu**)

equals **balis, fabalos, wut**

fathom **ngav, ngavav**

finger width **mbele**

fifty **ka zanaflu vavitmit** (-> **sanaaflu**)

five **kavitmit, malima, oplima, pakaraat**

four **mangfaat, orolavaat, xapkap**

forty **sanaflu varalavaat**

fractions **a ikakating pan a korovang, vang**

gentleman **piran**

go down **vizik**

great man **piran**

half **gbal**

hand **mit**

hundred **ka zanaflu vara zuai** (-> **sanaaflu**)

kilometre **vi**

kina: ten kina **falazing**

leader **piran**

length **braaving**

long **braaf**

Lord **Piran, Dipiran** (-> **piran**)

mathematics **katfaraxumuling**

meet **balos**

metre **mit**

ninety **ka zanaflu vavizikfaat** (-> **sanaaflu**)

numbers for counting abstractly **a doring ikakating**

numbers for counting items **a doring ikakating a zaan usfaa**

nine **ikula, singfaat, kavizikfaat** (-> **vizik**)

one **azaxei, hihep, sakare, saxe**

ordinal numbers **ikakating**

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part **vang**

plus **ma**

point (of land) **vi**

(to be) present **lok**

portion **gbal**

read **kot**

sacred counting system **a ikakating sin a maimaai**

sago thatch **raba**

sago thatch section between one and two metres long **rabafaal**

second **faruing** (-> **uru**)

send (someone to do something) **pizin**

seven **kavizikuru** (-> **vizik**), **sigurua**, **wira**

seventy **ka zanaflu vavizikuru** (-> **sanaaflu**)

share **fatavaraking**

six **isaxa**, **malimasiksaxa**, **dipiran**, **kaviziksaxei** (-> **vizik**)

sixty **ka zanaflu vaviziksaxei** (-> **sanaaflu**)

spear **mbele**

split (up) **fatarak**

subtract **wakpizin (-> pizin)**

take away **wakpizin (-> pizin)**

ten **lavaatazaar, sanaaflu, sangaafu**

the **a**

third **faroling (-> orol)**

thirty **sanaflu varaorol**

three **mangtal, orol, yaangi**

throw away **wakpizin (-> pizin)**

turn (upside down) **pukpizin (-> pizin)**

twenty **sanaflu vara'uru, singaafuvaru**

two **kimbo, maurua, uru**

wisdom **xapkap**

wrapper **falazing**

9.2. A ling a Pisin ka plas favizik a ling a Nalik/Tok Pisin-Nalik finder list

Dispela lista i no gat planti tok long mekim klia as mining bilong ol tok namba long tok Nalik. Dastawe i mobeta sapos yu painim moa tok aninit long hap we i gat ol tok Nalik i tanim i go long tok Inglis o Tok Pisin.

apim **pukpizin (-> pizin)**

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bikman **piran**

Bikpela **Piran, Dipiran** (-> **piran**)

brukim **fatarak, fatavaraking**

bung **balos**

dabolim **faruing** (-> **uru**)

dok **viu**

et(pela) **kalangga, kaviziktal** (-> **vizik**), **sintal, viu**

eti **ka zanaflu vaviziktal** (-> **sanaaflu**)

faiv **kavitmit, malima, oplima, pakaraat**

fifti **ka zanaflu vavitmit** (-> **sanaaflu**)

fo **mangfaat, orolavaat, xapkap**

foti **sanaflu varalavaat**

go daun **vizik**

han **lus, mit**

handert **ka zanaflu vara zuai** (-> **sanaaflu**)

hap **gbal, vang**

kam **wut**

kamap **balis**

kapsaitim **pukpizin** (-> **pizin**)

karamap **falazing**

kaunim **kot, ikakating**

kaunim bilong ol maimai **a ikakating sin a maimaai**

kaunim bilong ol tumbuna **a ikakating sin a xulmu**

kilomita **vi**

kina, tenpela **falazing**

long **braaf, braaving**

mita **mit**

na **ma**

nain **ikula, singfaat, kavizikfaat** (-> **vizik**)

nainti **ka zanaflu vavizikfaat** (-> **sanaaflu**)

(ol) namba **ikakating, vakating**

namba bilong brukim samting **a ikakating pan a korovang**

namba bilong kaunim **a doring ikakating**

namba bilong kaunim ol samting **a doring ikakating a zaan usfaa**

ナリク語の辞書作成の経過報告 NO.1

namba tri **faroling** (-> **orol**)

param **ngav, ngavav**

pinga **mbele**

poin **vi**

rausim **wakpizin** (-> **pizin**)

ritim **kot**

saksak **raba**

saksak: lip saksak **rabafaal**

save **xapkap**

salim (man long wokim samting) **pizin**

sentimita **mbele**

seven **kavizikuru** (-> **vizik**), **sigurua, wira**

seventi **ka zanaflu vavizikuru** (-> **sanaaflu**)

sikis **isaxa, malimasiksaxa, dipiran, kaviziksaxei** (-> **vizik**)

siksti **ka zanaflu vaviziksaxei** (-> **sanaaflu**)

(i) stap **lok**

tekewe **wakpizin** (-> **pizin**)

ten **lavaatazaar, sanaaflu, sangaafu**

tirti **sanaflu varaorol**

tri **mangtal, orol, yaangi**

tromwe **wakpizin (-> pizin)**

tu **kimbo, maurua, uru**

tumbuna **xulmu; ples tumbuna Lavu; tok tumbuna a doring Lavu**

tutaim **faruing (-> uru)**

twenti **sanaflu vara'uru, singaafuvalu**

wan **sakare, saxe**

wanpela **azaxei, hihep**

wok namba **katfaraxumuling**

wokim **balis, fabalos, wut**

Appendices

Appendix 1. Abbreviations and explanations used in the glossary

(A)	noun (<i>a</i> is the Nalik nonspecific article)
(ADJ)	adjectival verb
(COINED)	a new meaning or word “coined” recently
(COLL.)	colloquial
(CONJUNCTION)	conjunction
(KA)	verb (<i>ka</i> is the third person preverbal marker)
NE	Northern East Coast dialect

(<i>NON-COUNT</i>)	noncountable noun. Nouns not marked (<i>NON-COUNT</i>) can be counted.
(<i>NO DO</i>)	cannot have a direct object (intransitive). Verbs without (<i>NO DO</i>) can have a direct object (they are transitive). Many verbs can have a direct object if an <i>-ing</i> ending is added.
(<i>NOM</i>)	noun formed from a verb (nominalised)
(<i>-NUM</i>)	inalienable, uses possessive forms with <i>-nago</i> , <i>-num</i> , <i>-na</i> , etc. Nouns not marked (<i>-NUM</i>) are alienable and use separate possessive words such as <i>surago</i> , <i>sunum</i> , <i>sina</i> , etc.
<i>POC</i>	Proto Oceanic
<i>SE</i>	Southern East Coast Dialect
<i>TP</i>	Tok Pisin
(<i>YOUTH</i>)	the way younger persons speak
->	go to, see

Appendix 2. Abbreviations used in the text

<i>ART</i>	article
<i>CAU</i>	causative
<i>DUR</i>	durative
<i>LOC</i>	locative
<i>NOM</i>	nominaliser
<i>NTM</i>	nonterm grammatical relation
<i>OBL</i>	oblique grammatical relation
<i>POSS</i>	inalienable possessive
<i>REC</i>	reciprocal
<i>SG</i>	singular
3	third person
-	syllable division
:	portmanteau morpheme

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Note/A Doring sin a Piran

Comments and suggestions for improvements on this study, particularly by Nalik speakers, are most welcome. Please write to:

Ga zaxot, ga na rexazing a inaxaaming sunum pan a doring angkare. Yaak ka roxin a zanun doring di raksaat famumut o yaak gu rexaas pan a doring a ling a bina, ka vit ga varaal pana arit. Adu gu na lis a doring surago, ka doxo marazaat mase. Lis akula:

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