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CHAPTER 4

Phonology of Inland Terengganu Malay

4.1 Introduction

This chapter describes the phonology of ITM, primarily based on the variety spoken in Kampung Dusun. Given the considerable variation across different subvarieties of ITM (see Collins 1983a), the specific subvariety described here is referred to as "Dusun". The description begins by examining the segment inventory of Dusun in §4.2, followed by discussions on syllable structure in §4.3 and word structure in §4.4. Permitted consonant clusters, consonant sequences and vowel sequences are presented from §4.5 to §4.7. §4.8 discusses the stress pattern in Dusun. §4.9 summarises this chapter.

When comparing the phonology of Dusun to that of KM and CTM, it becomes evident that there are both shared similarities and notable differences. At the segment level, the consonant inventory of Dusun is identical to that of KM and CTM with twenty native phonemes, but the vowel system of Dusun presents distinct features. Moreover, differences can be observed in the phonotactic constraints on the distribution of segments, as will be discussed in detail throughout this chapter. Some important comparative findings regarding the phonologies of the NEPMs are summarised in §4.10.

4.2 Segment inventory

4.2.1 Consonant system

4.2.1.1 Consonant inventory

The consonant inventory of Dusun is presented in Table 4.1. There are twenty native consonants, consisting of nine stops, four nasals, three fricatives, two liquids and two glides.

Table 4.1: Consonant inventory of Dusun

		Labial	Dental	Alveolar	Palatal	Velar	Glottal
Stops	voiceless	p	t			k	ʔ
	voiced	b		d		g	
Nasals		m		n	ɲ	ŋ	
Fricatives	voiceless			s		x	h
	voiced			(z)			
Affricates	voiceless				c		
	voiced				j		
Liquids				l		ɣ	
Glides		w			y		

(c = IPA /c͡ç/, j = IPA /ɟ͡ʝ/, y = IPA /j/)

Asymmetry in the phonetic values of the dental-alveolar stops is also displayed in Dusun, with the voiceless stop articulated as dental [t̪] and its voiced counterpart as alveolar [d]. /ɣ/ is also treated as a liquid rather than a fricative.

The voiced alveolar fricative /z/ is taken as a marginal phoneme, as it is found in loanwords such as /zamaŋ/ 'epoch' < Arabic *zamān* (which also alternates with [jamãŋ]) and /bizɛ/ 'different' < Sanskrit *bheda* (presumably via SM *bɛza*). It cannot be taken as a free variation of /j/, as the realisation of /j/ does not show variation in other words.

4.2.1.2 Contrasts between consonants

Phonemic contrasts between similar consonants in Dusun are demonstrated by (near-)minimal pairs presented in Table 4.2. Contrasts found in

word-initial, -medial and -final positions are distinguished. The distribution of consonants in Dusun is discussed in §4.4.3.1.

Table 4.2: Contrasts between consonants in Dusun

Contrast	Pair	Gloss
Word-initially		
/p/ - /b/	/**p**adaŋ/	'suitable'
	/**b**adaŋ/	'body'
/b/ - /m/	/**b**ukɛ/	'open'
	/**m**ukɛ/	'face'
/t/ - /d/	/**t**əbəʊ/	'sugarcane'
	/**d**əbəʊ/	'dust'
/d/ - /n/	/**d**ai/	'forehead'
	/**n**aiʔ/	'to climb, to go up; to ride'
/c/ - /j/	/**c**aɣɛi/	'to search'
	/**j**aɣɛi/	'finger'
/j/ - /ɲ/	/**j**awɛ/	'Jawa'
	/**ɲ**awɛ/	'soul'
/k/ - /g/	/**k**alɛi/	'times'
	/**g**alɛi/	'to dig'
/k/ - /x/	/**k**usɛi/	'to share'
	/**x**usɛi/	'chair'
/g/ - /ɣ/ - /l/	/**g**ata/	'itchy'
	/**ɣ**ata/	'necklace'
	/**l**ata/	'floor'
/m/ - /n/	/**m**ikɛ/	'3PL'
	/**n**akɛ/	'jackfruit'
/l/ - /n/	/**l**amɛ/	'long (time)'
	/**n**amɛ/	'name'
Word-medially		
/p/ - /b/ - /m/	/li**p**ɔ/	'to throw'
	/li**b**ɔ/	'wide'
	/li**m**ɔ/	'lemon, citrus'
/t/ - /d/	/u**t**ɔŋ/	'debt'
	/u**d**ɔŋ/	'shrimp'

Contrast	Pair	Gloss
/d/ - /n/	/kə**d**a/	'shop'
	/kə**n**a/	'to know'
/c/ - /j/	/ka**c**ɔŋ/	'bean'
	/ka**j**ɔŋ/	'Kajang (toponym)'
/j/ - /ɲ/	/sə**j**aʔ/	'to evaporate'
	/sə**ɲ**aʔ/	'quiet'
/k/ - /g/- /ŋ/	/i**k**aʔ/	'to tie up'
	/i**g**aʔ/	'to catch'
	/i**ŋ**aʔ/	'to think'
/g/ - /ɣ/	/pə**g**ɔŋ/	'to hold'
	/pə**ɣ**ɔŋ/	'war'
/m/ - /n/	/tə**m**uŋ/	'to encounter'
	/tə**n**uŋ/	'to weave'
/n/ - /ŋ/	/ta**n**aŋ/	'to plant'
	/ta**ŋ**aŋ/	'hand'
/n/ - /ɲ/	/ku**n**iŋ/	'yellow'
	/ku**ɲ**iʔ/	'turmeric'
/l/ - /n/	/pə**l**əʊh/	'sweat'
	/pə**n**əʊh/	'full'
/l/ - /ɣ/	/bə**l**ah/	'ten'
	/bə**ɣ**ah/	'husked rice'
/s/ - /h/	/a**s**aʔ/	'smoke'
	/a**h**aʔ/	'Sunday'
/y/ - /w/	/la**y**ɔ/	'to sail'
	/la**w**ɔ/	'beautiful'
Word-finally		
/ʔ/ - Ø	/iku**ʔ**/	'to follow'
	/iku/	'tail; CLF'
/ŋ/ - Ø	/panda**ŋ**/	'pandan'
	/panda/	'clever'
/h/ - Ø	/ɣama**h**/	'to squeeze'
	/ɣama/	'many'
/ʔ/ - /h/	/cucəʊ**ʔ**/	'to skewer'
	/cucəʊ**h**/	'to light up'

Contrast	Pair	Gloss
/ʔ/ - /ŋ/	/tulɔ**ʔ**/	'to push'
	/tulɔ**ŋ**/	'bone'
/h/ - /ŋ/	/buka**h**/	'to bundle'
	/buka**ŋ**/	'NEG'

Initial geminates are also attested in Dusun. Table 4.3 lists (near-) minimal pairs contrasting a singleton and a geminate in word-initial position.

Table 4.3: Contrasts between singletons and geminates in Dusun

Contrast	Pair	Gloss
/p/ - /pp/	/**p**alɛ/	'nutmeg'
	/**pp**alɛ/	'head'
/b/ - /bb/	/**b**au/	'smell'
	/**bb**au/	'smelly'
/t/ - /tt/	/**t**upaʔ/	'compact'
	/**tt**upaʔ/	'k.o. rice cake'
/d/ - /dd/	/**d**iɣɛi/	'self'
	/**dd**iɣɛi/	'to stand'
/c/ - /cc/	/**c**abɔŋ/	'branch'
	/**cc**abɔŋ/	'branched'
/j/ - /jj/	/**j**alaŋ/	'road'
	/**jj**alaŋ/	'to walk'
/k/ - /kk/	/**k**alɛi/	'times'
	/**kk**alɛi/	'most'
/g/ - /gg/	/**g**ajɛi/	'wage'
	/**gg**ajɛi/	'saw (n.)'
/m/ - /mm/	/**m**asɔʔ/	'ripe'
	/**mm**asɔʔ/	'to cook'
/n/ - /nn/	/**n**akɛ/	'jackfruit'
	/**nn**aɣɛ/	'tower'
/ɲ/ - /ɲɲ/	/**ɲ**awɛ/	'soul'
	/**ɲɲ**awɛ/	'to breathe'
/s/ - /ss/	/**s**alɔh/	'mistake'
	/**ss**alɔh/	'to make mistake'

Contrast	Pair	Gloss
/l/ - /ll/	/**l**aŋiʔ/	'sky'
	/**ll**aŋiʔ/	'palate'
/ɣ/ - /ɣɣ/	/**ɣ**ahɔŋ/	'jaw'
	/**ɣɣ**ahaŋ/	'molar tooth'

Among the twenty phonemic consonants in Dusun, the glottals /ʔ, h/ and the glides /w, y/ do not occur as geminates. As in KM and CTM, no clear contrast between /ŋ/ and /ŋŋ/ is found in Dusun, as the velar nasal /ŋ/ mostly occurs in a geminated form /ŋŋ/, e.g., /ŋŋali/ 'to flow' and /ŋŋakəʊ/ 'to confess'. There is also no clear contrast between initial /x/ and /xx/, which appear to have a complementary distribution. In careful speech, /xx-/ is attested before /a, ə/ whereas /x-/ is attested before /i, u/, but there is more variation in natural speech production. As will be discussed in more detail in §7.5.2.3, /xx-/ originates from the assimilation of earlier $^{+}$kɣ- clusters, which was then reduced to /x-/ before the high vowels /i, u/, as in the following examples: Sanskrit *karaṇa* > SM *kərani* > /xxaniŋ/ 'clerk', Portuguese *carreta* > SM *kərɛta* > $^{+}$xxɛta > /xitɛ/ 'car', and Arabic *kursiyy* > SM *kərusi* > $^{+}$xxusi > /xusɛi/ 'chair' (cf. CTM /xxaniŋ/, /xxɛtə/ and /xxusi/). The velar liquid /ɣ/ and its geminate counterpart /ɣɣ/ have been reduced in a similar way. Before the high vowels /i, u/, $^{+}$ɣɣ- was reduced to /ɣ-/, and $^{+}$ɣ- was reduced to Ø. Compare Dusun /ɣudɛi/ 'drill' with SM *gərudi* (presumably via $^{+}$ɣɣudi), /iŋaŋ/ 'light' with SM *riŋan*, and /usɛ/ 'deer' with SM *rusa*.

At the phonological level, geminates in Dusun are analysed as a subtype of consonant clusters. Variations between forms with geminate clusters and forms with a non-geminate clusters are also attested in Dusun, as in examples like /tmakɔ/~/mmakɔ/ 'tobacco' and /smayɔŋ/~/mmayɔŋ/ 'to pray'.

4.2.1.3 Phonetic realisations of consonants

Similar to KM and CTM, the glottal fricative /h/ and the velar fricative /x/ exhibit variable phonetic realisations in Dusun, which are summarised in Table 4.4. Other consonants are realised fairly consistently.

Table 4.4: Phonetic realisations of some consonant phonemes in Dusun

Phoneme	Realisation	Environment	Example		Gloss
/h/	[ç]~[h]	i__#	/nipi**h**/	[nĩpi**ç**]~[nĩpi**h**]	'thin'
			/piti**h**/	[piti**ç**]~[piti**h**]	'money'
	[h]	elsewhere	/ata**h**/	[ata**h**]	'top'
			/kabu**h**/	[kabu**h**]	'fog'
			/putɛi**h**/	[putæe̯**h**]	'white'
			/jatəʊ**h**/	[jatɐo̯**h**]	'to fall'
/x/	[x]~[k]	#__	/**x**usi/	[**x**usi]~[**k**usi]	'chair'
			/**xx**ətah/	[**xx**ətah]~[**kk**ətah]	'paper'

Word-final /h/ following a high front vowel /i/ is often realised as a voiceless palatal fricative [ç]. It is noteworthy that final-syllable /i/ in Dusun has a tendency to be diphthongised in closed syllables (see more detail in §4.2.2.3); accordingly, /-ih/ can be realised as [-iç]~[-ɪi̯ç] following non-nasal onsets and as [-ĩç]~[-ɛ̃ĩç] following nasal onsets. For example, /pitih/ is realised as [pitiç]~[pitɪi̯ç] 'money' and /manih/ as [mãnĩç]~[mãnɛ̃ĩç] 'sweet'.

The velar fricative /x/ and its geminated form /xx/ tend to merge with the velar stop /k/ or /kk/ in word-initial position, which is primarily observed in the speech of younger speakers. Examples include /xusɛi/ [xusɛi]~ [kusɛi] 'chair', /xxəjɛ/ [xxəjɛ]~[kkəjɛ] 'work' and /xxətah/ [xxətah]~[kkətah] 'paper'.

4.2.2 Vowel system

4.2.2.1 Vowel inventory

The vowel inventory of Dusun consists of ten monophthongs and two diphthongs. The ten monophthongs include six oral vowels and four nasal vowels, as presented in Table 4.5.

Table 4.5: Inventory of monophthongs in Dusun

	Front	Central	Back
High	i, ĩ		u, ũ
Mid	ɛ	ə	ɔ, ɔ̃
Low		a, ã	

In addition to the three basic vowels /a, i, u/ and a schwa, there is only one set of mid vowels /ɛ, ɔ/ in Dusun, as opposed to KM and CTM which contrast mid-low vowels with mid-high vowels. The four nasal vowels /ã, ĩ, ũ, ɔ̃/ have limited presence, and no clear minimal pairs contrasting a nasal vowel and a corresponding oral vowel have been identified. Yet, these nasal vowels are considered phonemic for two reasons: first, they occur independent of nasal contexts, as in /duʔ**ã**/ 'to pray', /kəcĩʔ/ 'small', /bus**ũ**ʔ/ 'rotten' and /hɔ̃/ 'AFF', which means that they are not allophonic variations of oral vowels. Second, they show consistent pronunciation without variation.

In contrast to phonemic nasal vowels, nasalised vowels are prevalent in Dusun due to the process of progressive nasal spreading. Nasality can also spread over glides and glottals, affecting more than one vowel (see §2.2.2.1 for a similar phenomenon explained for KM). For instance, /naiʔ/ 'to climb' and /ŋŋuwaʔ/ 'to yawn' are articulated as [nãĩʔ] and [ŋŋũwãʔ] with both vowels carrying nasality. Additionally, the presence of nasal consonants and vowel nasalisation can affect the height of some vowels, as will be discussed in §4.2.2.3.

Dusun has two phonemic diphthongs /ɛi/ and /əʊ/. There is a larger number of phonetically distinctive diphthongs, but based on their complementary distributions, some are analysed as possible realisations of the high vowels /i, u/, and some as allophones of the same diphthong phoneme. The current analysis is motivated in §4.2.2.3.

4.2.2.2 Contrasts between vowels

The phonemic status of Dusun vowels is demonstrated by minimal or near-minimal pairs presented in Table 4.6. Contrasts found in penultimate and final syllables are distinguished. Phonotactic constraints on vowel distributions are discussed in §4.4.3.2.

Table 4.6: Contrasts between oral vowels in Dusun

Contrast	Pair	Gloss
Penultimate syllables		
/a/ - /i/ - /u/	/ma**ɣ**ɔh/	'angry'
	/mi**ɣ**ɔh/	'red'
	/mu**ɣ**ɔh/	'cheap'
/a/ - /ə/	/p**a**ta/	'beach'
	/p**ə**ta/	'bitter bean'
/i/ - /ə/	/b**i**lɛ/	'when'
	/b**ə**lɛ/	'to breed'
/u/ - /ə/	/b**u**nɔŋ/	'to swim'
	/b**ə**nɔŋ/	'thread'
Final syllables		
/a/ - /i/	/mas**a**ŋ/	'sour'
	/mas**i**ŋ/	'salty'
/a/ - /u/ - /ɛi/	/tup**a**/	'squirrel'
	/tup**u**/	'dull'
	/tup**ɛi**/	'cap, hat'
/a/ - /ɛ/	/pət**a**/	'bitter bean'
	/pət**ɛ**/	'map'
/a/ - /ɔ/	/pak**a**/	'to wear; to use'
	/pak**ɔ**/	'expert'
/i/ - /u/ - /ɔ/	/uk**i**/	'to carve'
	/uk**u**/	'to measure'
	/uk**ɔ**/	'to scratch'
/i/ - /ɛ/	/kat**i**/	'bed'
	/kat**ɛ**/	'to say'
/i/ - /ɔ/ - /əʊ/	/pas**i**/	'sand'
	/pas**ɔ**/	'market'
	/pas**əʊ**/	'flower pot'
/u/ - /ɛ/	/but**u**/	'bottle'
	/but**ɛ**/	'blind'
/ɛ/ - /ɔ/	/lim**ɛ**/	'five'
	/lim**ɔ**/	'lemon, citrus'
/ɛi/ - /i/	/tap**ɛi**/	'but'
	/tap**i**/	'to come forward'

Contrast	Pair	Gloss
/ɛi/ - /ɛ/	/mat**ɛi**/	'to die'
	/mat**ɛ**/	'eye'
/ɛi/ - /ɔ/	/pag**ɛi**/	'morning'
	/pag**ɔ**/	'fence'
/əʊ/ - /a/	/təb**əʊ**/	'sugarcane'
	/təb**a**/	'thick'
/əʊ/ - /u/	/dəb**əʊ**/	'dust'
	/dəb**u**/	'splash'
/əʊ/ - /ɛ/	/kay**əʊ**/	'wood'
	/kay**ɛ**/	'rich'
/ɛi/ - /əʊ/	/at**ɛi**/	'liver'
	/at**əʊ**/	'ghost'

4.2.2.3 Phonetic realisations of vowels

The vowels in Dusun exhibit complex variations in their phonetic realisations. Both allophonic and free variations exist. This section provides a more detailed description of these vowel variations.

4.2.2.3.1 The low vowel

The low vowel /a/ has a fairly consistent realisation as [a], except when following a nasal consonant, in which case it is nasalised as [ã]. For instance, /m**a**k**a**n/ 'to eat' and /p**a**n**a**h/ 'warm' are realised as [m**ã**k**a**n] and [p**a**n**ã**h] respectively.

4.2.2.3.2 The mid vowels

The mid front unrounded vowel /ɛ/ is usually realised as [ɛ]. When following a nasal consonant, it is nasalised and raised. The result of raising can be as high as [ĩ] in careful speech, although in connected speech it is often [ẽ]. The allophonic variations of /ɛ/ are illustrated in Table 4.7.

Table 4.7: Phonetic realisations of /ɛ/ in Dusun

Phoneme	Realisation	Environment	Example		Gloss
/ɛ/	[ĩ]~[ẽ]	C[+nasal]__	/manɛ/	[mãnĩ]~[mãnẽ]	'where'
			/limɛ/	[limĩ]~[limẽ]	'five'
			/buŋɛ/	[buŋĩ]~[buŋẽ]	'flower'
			/taɲɛ/	[taɲĩ]~[taɲẽ]	'to ask'
	[ɛ]	C[-nasal]__	/matɛ/	[mãtɛ]	'eye'
			/usɛ/	[usɛ]	'deer'
			/gulɛ/	[gulɛ]	'sugar'
			/diyɛ/	[diyɛ]	'3sG'

The mid back round vowel /ɔ/ is lowered to [ɑ] when preceding a velar nasal /ŋ/; in essence, /ɔŋ/ is phonetically realised as [ɑŋ]. A phonemic contrast between /aŋ/ and /ɔŋ/ is thus in fact a contrast between [aŋ] and [ɑŋ] at the phonetic level, as can be seen from the following minimal pairs:

(1) a. /utaŋ/ [utaŋ] 'forest; rattan'
/utɔŋ/ [utɑŋ] 'debt'
b. /piŋgaŋ/ [piŋgaŋ] 'plate'
/piŋgɔŋ/ [piŋgɑŋ] 'waist'
c. /padaŋ/ [padaŋ] 'to fit'
/padɔŋ/ [padɑŋ] 'field'

These two "a"-like sounds have been reported in some subvarieties of ITM, transcribed as [æ] vs. [a] (Collins 1983a: 32–37). In Dusun, the phonetic values of these two sounds are [a] vs. [ɑ]. The low back vowel [ɑ] is taken as an allophone of /ɔ/ before a velar nasal, and a phonetic realisation of ˣ[ɔŋ] is never found. When following a nasal onset, /ɔ/ is also nasalised, and /ɔŋ/ is realised as [ɑ̃ŋ]. In other contexts, /ɔ/ is realised as [ɔ]. The allophonic variations of /ɔ/ are summarised in Table 4.8.

Table 4.8: Phonetic realisations of /ɔ/ in Dusun

Phoneme	Realisation	Environment	Example		Gloss
/ɔ/	[ɑ]	__ŋ#	/utɔŋ/	[utɑŋ]	'debt'
			/blakɔŋ/	[blakɑŋ]	'back'
			/musɔŋ/	[mũsɑŋ]	'civet cat'
	[ɑ̃]	C[+nasal]__ŋ#	/mimɔŋ/	[mĩmɑ̃ŋ]	'indeed'
			/bunɔŋ/	[bunɑ̃ŋ]	'to swim'
			/pinɔŋ/	[pinɑ̃ŋ]	'areca nut'
	[ɔ̃]	C[+nasal]__Ø, ʔ, h#	/dəŋɔ/	[dəŋɔ̃]	'to hear'
			/anɔʔ/	[anɔ̃ʔ]	'child'
			/timɔh/	[timɔ̃h]	'tin'
	[ɔ]	elsewhere	/bakɔ/	[bakɔ]	'to burn'
			/kapɔʔ/	[kapɔʔ]	'axe'
			/daɣɔh/	[daɣɔh]	'blood'

4.2.2.3.3 The high vowels

The high vowels /i, u/ exhibit various realisations in different environments, conditioned by a number of factors including their position in a word, the presence of an onset and coda, as well as the nasality of the onset.

In non-final syllables, /i, u/ are consistently realised as [i, u] unless following a nasal onset, which nasalises the subsequent vowel. For example, /**i**ku/ 'tail' and /k**u**bɔ/ 'buffalo' are realised as [**i**ku] and [k**u**bɔ], but /nn**i**kɔh/ 'to marry' and /m**u**dɛ/ 'young' are realised as [nn**ĩ**kɔh] and [m**ũ**dɛ].

In final syllables, there is more variation in the realisations of the high vowels, which tend to be diphthongised. However, this tendency only occurs in final closed syllables with an onset. For instance, the final-syllable /i/ in /kul**i**ʔ/ 'skin' and /u/ in /mul**u**ʔ/ 'month' can be realised as [i]~[ɪ̯] and [u]~[ʊ̯] respectively, varying across speakers. Therefore, /kuliʔ/ 'skin' can be phonetically realised as [kuliʔ]~[kulɪ̯ʔ], and /muluʔ/ 'month' as [mũluʔ]~ [mũlʊ̯ʔ]. When the onset of the final syllable is a nasal, as in /kamiŋ/ '1PL.EXCL' or /bunuh/ 'to kill', diphthongisation of high vowels results in [ɛ̃ɪ̯] and [ɔ̃ʊ̯] respectively, exhibiting the centralisation effect of

nasal onsets, as compared to [ɪ̯] and [ʊ̯] (Beddor 1983; Beddor et al. 1986). /kamiŋ/ '1PL.EXCL' is often pronounced as [kamɛ̃ɪ̯̃ŋ], and /bunuh/ 'to kill' as [bunə̃ʊ̯̃h], but [kamĩŋ] and [bunũh] are also heard. When the final syllable is onsetless, as in /kaiŋ/ 'cloth' and /jauh/ 'far', the high vowels are never diphthongised. Table 4.9 illustrates the tendency of diphthongisation of /i/ and /u/ in final closed syllables.

Table 4.9: Diphthongisation of high vowels in final closed syllables in Dusun

Phoneme	Realisation	Environment	Example		Gloss
/i/	[i]~[ɪ̯]	C[-nasal]__C#	/kuliʔ/	[kuliʔ]~[kulɪ̯ʔ]	'skin'
			/ssəkiŋ/	[ssəkiŋ]~[ssəkɪ̯ŋ]	'poor'
			/nipih/	[nĩpiç]~[nĩpɪ̯ç]	'thin'
	[ĩ]~[ɛ̃ɪ̯̃]	C[+nasal]__C#	/tumiʔ/	[tumĩʔ]~[tumɛ̃ɪ̯̃ʔ]	'heel'
			/kamiŋ/	[kamĩŋ]~[kamɛ̃ɪ̯̃ŋ]	'1PL.EXCL'
			/bənih/	[bənĩh]~[bənɛ̃ɪ̯̃h]	'seed'
	[i]	Ø__C#	/jaiʔ/	[jaiʔ]	'to sew'
			/kaiŋ/	[kaiŋ]	'cloth'
/u/	[u]~[ʊ̯]	C[-nasal]__C#	/cukuʔ/	[cukuʔ]~[cukʊ̯ʔ]	'enough'
			/kəbuŋ/	[kəbuŋ]~[kəbʊ̯ŋ]	'farm'
			/tikuh/	[tikuh]~[tikʊ̯h]	'mouse'
	[ũ]~[ə̃ʊ̯̃]	C[+nasal]__C#	/səmuʔ/	[səmũʔ]~[səmə̃ʊ̯̃ʔ]	'ant'
			/tənuŋ/	[tənũŋ]~[tənə̃ʊ̯̃ŋ]	'to weave'
			/bunuh/	[bunũh]~[bunə̃ʊ̯̃h]	'to kill'
	[u]	Ø__C#	/tauŋ/	[tauŋ]	'year'
			/jauh/	[jauh]	'far'

Diphthongisation also fails to occur in final open syllables. High vowels in this position are always realised as monophthongs, e.g., /kati/ [kati] 'bed' and /sayu/ [sayu] 'vegetable'. They are nasalised when following a nasal onset, e.g., /bani/ [banĩ] 'buttress root', /cumi/ [cumĩ] 'beautiful', /umu/ [umũ] 'age' and /timu/ [timũ] 'east'.

4.2.2.3.4 The diphthongs

The two phonemic diphthongs /ɛi/ and /əʊ/ in Dusun only occur in final syllables (see §4.4.3.2). They display allophonic variations, conditioned by the coda of the syllable.

In open syllables, /ɛi/ and /əʊ/ are realised as [ɛi̯] and [əʊ̯], e.g., /apɛi/ [apɛi̯] 'fire' and /buləʊ/ [buləʊ̯] 'feather'. In closed syllables, they are lowered to [æɛ̯] and [ɐɔ̯] respectively, as in /tasɛiʔ/ [tasæɛ̯ʔ] 'lake' and /tujəʊh/ [tujɐɔ̯h] 'seven'. No minimal pairs contrasting [ɛi̯] with [ɐɔ̯] or [əʊ̯] with [ɐɔ̯] are found, as these two sets of diphthongs show clear complementary distributions. The following minimal pairs in (2) thus do not only contrast final open syllables with closed syllables, but also have different nuclei in final syllables.

(2)	a.	/kucɛi/	[kucɛi̯]	'lock'
		/kucɛiŋ/	[kucæɛ̯ŋ]	'cat'
	b.	/buwɛi/	[buwɛi̯]	'to give'
		/buwɛih/	[buwæɛ̯h]	'foam'
	c.	/kaləʊ/	[kaləʊ̯]	'if'
		/kaləʊŋ/	[kaɐɔ̯ŋ]	'to throw'
	d.	/buləʊ/	[buləʊ̯]	'feather'
		/buləʊh/	[buɐɔ̯h]	'bamboo'

Diphthongs in Dusun do not usually occur after nasal onsets except in a few special cases, e.g., the deictics /nɛiŋ/ 'DEM.PROX' and /sinɛiŋ/ 'here', as well as the personal pronoun /məʊŋ/ '2SG'.[22] The phonetic realisations of diphthongs in these words are lowered and nasalised, i.e., [nãɛ̯̃ŋ], [sinãɛ̯̃ŋ] and [mɐ̃ɔ̯̃ŋ] respectively.

Table 4.10 summarises the phonetic realisations of diphthongs in Dusun.

[22] In these cases, the diphthongs are always followed by a velar nasal /ŋ/. Diphthongs never occur in an open syllable with a nasal onset, see §4.3.

Table 4.10: Phonetic realisations of diphthongs in Dusun

Phoneme	Realisation	Environment	Example		Gloss
/ɛi/	[ɛi̯]	__#	/atɛ**i**/	[atɛi̯]	'liver'
			/mmipɛ**i**/	[mmĩpɛi̯]	'to dream'
	[æɛ̯]	__C#	/tasɛ**i**ʔ/	[tasæɛ̯ʔ]	'lake'
			/kucɛ**i**ŋ/	[kucæɛ̯ŋ]	'cat'
			/putɛ**i**h/	[putæɛ̯h]	'white'
	[æ̃ɛ̯̃]	C[+nasal]__C#	/nɛ**i**ŋ/	[næ̃ɛ̯̃ŋ]	'this'
			/sinɛ**i**ŋ/	[sinæ̃ɛ̯̃ŋ]	'here'
/əʊ/	[əʊ̯]	__#	/batə**ʊ**/	[batəʊ̯]	'stone'
			/abə**ʊ**/	[abəʊ̯]	'ash'
	[ɐɔ̯]	__C#	/tandə**ʊ**ʔ/	[tandɐɔ̯ʔ]	'horn'
			/idə**ʊ**ŋ/	[idɐɔ̯ŋ]	'nose'
			/tujə**ʊ**h/	[tujɐɔ̯h]	'seven'
	[ɐ̃ɔ̯̃]	C[+nasal]__C#	/mə**ʊ**ŋ/	[mɐ̃ɔ̯̃ŋ]	'2SG'

4.2.2.3.5 The nasal vowels

Nasal vowels in Dusun do not show variation in their phonetic realisations, and they are consistently pronounced with nasality. Some examples of words with a nasal vowel are given in (3).

(3) /duʔ**ã**/ 'to pray'
/suʔ**ã**/ 'to question'
/sikĩʔ/ '(a) little'
/kəcĩʔ/ 'small'
/matɛ kaĩ/ 'fish hook'
/busũʔ/ 'smelly'
/clabũʔ/ 'plop' (an ideophone)
/hɔ̃/ 'AFF'
/kisɔ̃ʔ/ 'to scoot over'

4.3 Syllable structure

Syllables in Dusun have a template of (C)(C)V(C). Only a nucleus V is obligatory, and diphthongs take the slot of one V. In onset position, a consonant cluster CC is allowed, whereas a coda can only be a simple C. Possible syllable types in Dusun are presented in Table 4.11.

Table 4.11: Overview of syllable types in Dusun

Onset	Nucleus	Coda
	V	
	V	C
C	V	
C	V	C
CC	V	
CC	V	C

Table 4.12 summarises the distribution of consonants in Dusun at the syllable level.

Table 4.12: Distribution of consonants in Dusun at the syllable level

Position	p	b	t	d	c	j	k	g	ʔ	m	n	ɲ	ŋ	s	x	h	l	ɣ	w	y
onset	+	+	+	+	+	+	+	+	(+)	+	+	+	+	+	+	+	+	+	+	+
coda	-	-	-	-	-	-	-	-	+	(+)	(+)	(+)	+	(+)	-	+	-	-	-	-

(+ : attested, - : not attested, (+) : attested but restricted)

Distributional constraints on single consonants in Dusun are similar to those in KM and CTM, but there are some important differences. In onset position, while a glottal stop is never phonemic in the native lexicon of KM and CTM, there are two instances of an onset glottal stop in Dusun, as in /ma.ʔa.mɛ/ 'butterfly' and /ma.ta.ʔa.ɣɛi/ 'sun' (which are apparently native, reflecting an earlier full reduplicated form or a compound, cf. SM *rama-rama* and *mata-hari*).[23] In coda position, only nasals and the glottals

[23] Alternatively, the underlying forms of these words may be analysed as /ma.a.mɛ/

/ʔ, h/ are permitted. Similar to KM and CTM, when /m, n, ɲ/ occur as a coda in Dusun, they only appear in word-medial position, and they are always followed by a homorganic voiced stop to form a consonant sequence /-m.b-, -n.d-, -ɲ.j-/. Importantly, the voiceless alveolar sibilant /s/ is also attested as a coda in Dusun, occurring in a penultimate syllable and immediately followed by another consonant, as seen in words like /məs.tɛ/~/mis.tɛ/ 'mangosteen', /is.na/ 'Monday' and /mis.kiŋ/ 'poor'. There are two reasons to analyse /s/ as the coda of the penultimate syllable instead of part of a complex onset of the final syllable. First, a complex onset is never found in word-medial position in other words; treating ˣst-, ˣsn- and ˣsk- as onset clusters would alter the basic disyllabic template in Dusun (see §4.4). Second, /mis.kiŋ/ 'poor' has a variant /ssə.kiŋ/ 'poor', which suggests that the sibilant belongs to the first syllable. It is worth mentioning that two of the three examples provided are ultimately loanwords: /isna/ 'Monday' < Arabic *ithnain* and /miskiŋ/ 'poor' < Arabic *miskīn* (cf. SM *isnin* and *miskin*). The origin of /məs.tɛ/~/mis.tɛ/ 'mangosteen' is not clear.[24] Therefore, the presence of a coda /s/ in the penultimate syllable might be a foreign feature, but no conclusion can be drawn yet, hence it was indicated by (+) in Table 4.12. Word-medial consonant sequences -C.C- are discussed further in §4.6.

Combinations of consonants in CC clusters in onset position will be discussed in §4.5. Just as in KM and CTM, CC clusters in Dusun can consist of either two identical segments C_xC_x or two dissimilar segments C_xC_y.

The distributional patterns of vowels at the syllable level are fairly complex, as summarised in Table 4.13.

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and /ma.ta.a.ɣɛi/, whereby the glottal stop between two [a] at the phonetic level derives from a rule of glottal stop epenthesis between two identical vowels, e.g., /maamɛ/ → [mãʔãmĩ]~[mãʔãmẽ] (for the raising of final /ɛ/ following a nasal onset, see §4.2.2.3.2). However, this analysis is also not optimal as no other words in Dusun exhibit glottal stop epenthesis. These words thus represent idiosyncratic cases regardless of the phonemic status of the glottal stop.

[24] It is not listed as a loanword in Jones (2007), and it has cognates in KM (/ssətɔ/) and in CTM (/ssətə/), which would reflect an earlier form ⁺mista.

Table 4.13: Distribution of oral vowels in Dusun at the syllable level

Syllable type	a	i	u	ɛ	ɔ	ə	ɛi	əʊ
V	+	+	+	+	+	-	-	-
VC	+	+	+	-	+	-	-	-
CV	+	+	+	+	+	+	+	+
CVC	+	+	+	-	+	+	+	+
CCV	+	+	+	-	-	+	-	-
CCVC	+	+	+	-	-	+	-	-

(+ : attested, - : not attested)

Only /a, i, u/ can occur with all types of syllables. The mid vowels /ɛ, ɔ/ and the diphthongs /ɛi, əʊ/ do not occur in syllables with a complex onset, as they typically appear in final syllables at the word level (see §4.4.3.2), whereas CCV(C) syllables are restricted to non-final positions. Furthermore, the mid front vowel /ɛ/ only occurs in open syllables (C)V, and neither the schwa /ə/ nor the diphthongs /ɛi, əʊ/ are permitted in onsetless syllables V(C).[25] The distribution of diphthongs is also conditioned by the nasality of the onset. As mentioned earlier, diphthongs do not usually occur following a nasal onset except in a few function words, e.g., /nɛiŋ/ 'DEM.PROX', /sinɛiŋ/ 'here' and /məʊŋ/ '2SG', where they are surrounded by two nasals.

Nasal vowels in Dusun are also often followed by a glottal stop /ʔ/, as in /kəcĩʔ/ 'small', /sikĩʔ/ '(a) little' and /busũʔ/ 'smelly'. Some exceptions include /matɛ kaĩ/ 'fish hook' and /duʔã/ 'to pray' < Arabic *duʿāʾ*.

[25] Words like /buwɛi/ 'to give', /buwɛih/ 'foam' and /iyəʊ/ 'shark' could potentially be analysed as /bu.ɛi/, /bu.ɛih/ and /i.əʊ/ respectively, placing the diphthongs /ɛi, əʊ/ in onsetless syllables. However, the phonemic status of intervocalic glides following a high vowel is argued for based on independent evidence, namely the alternation between forms like /wɛi/~/buwɛi/ 'to give', see §4.4.3.1. The incompatibility of diphthongs with onsetless syllables can be explained from a diachronic perspective, as these diphthongs reflect earlier high vowels, and the diphthongisation process only took place in syllables with an onset, see §7.4.4.2.

4.4 Word Structure

The majority of words in Dusun, whether morphologically simple or derivative, have a canonical disyllabic shape with a (C)(C)V(C).(C)V(C) template. A small number of morphologically simple monosyllables are also found in the corpus. As in KM and CTM, words with more than two syllables in Dusun are typically borrowed.

The phonological structure of simple words and derivatives in Dusun are examined in §4.4.1 and §4.4.2 respectively. Phoneme distributions at the word level are presented in 4.4.3.

4.4.1 Structure of simple words

Simple words in Dusun can be mono-, di-, tri- and quadri-syllabic.

Table 4.14 presents possible syllable types in monosyllables, which have a (C)(C)V(C) shape. Monosyllables with a ˣCCV shape are not attested, and V(C) syllable types are only found in interjections. While a handful of content words can be monosyllabic, monosyllables are more commonly function words, such as the personal pronoun /məʊŋ/ '2SG', prepositions /ŋaŋ/ 'with' and /də/ 'LOC', as well as the negator /dɔʔ/ 'NEG'.

Table 4.14: Monosyllabic simple words in Dusun

Syllable type	Example	Gloss
V	/a/	'INTERJ'
VC	/ɛh/	'INTERJ'
CV	/gɛi/	'to go'
CVC	/nɔʔ/	'to want'
CCVC	/mbuh/	'to blow'

The majority of simple words in Dusun consist of two syllables and follow a (C)(C)V(C).(C)V(C) template. Any C is optional, but syllables with a complex onset CC can occur word-initially. All other possible combinations of two syllables, except for ˣV.VC and ˣCCV.VC, are attested and presented in Table 4.15.

Table 4.15: Disyllabic simple words in Dusun

Syllable type	Example	Gloss
V.V	/a.i/	'water'
V.CV	/i.ku/	'tail; CLF'
V.CVC	/i.gaʔ/	'to catch'
VC.CVC	/am.bɛiʔ/	'to take'
CV.V	/da.i/	'forehead'
CV.VC	/ta.uŋ/	'year'
CV.CV	/pa.si/	'sand'
CV.CVC	/da.ɣɔh/	'blood'
CVC.CV	/jaŋ.ga/	'awkward'
CVC.CVC	/pin.dɛiʔ/	'short'
CCV.V	/pɣa.u/	'canoe'
CCV.CV	/ŋŋa.jɛ/	'deliberately'
CCV.CVC	/nna.tɔŋ/	'animal'
CCVC.CV	/blaɲ.jɛ/	'expense; bride price'
CCVC.CVC	/jɣəm.bəʊŋ/	'to clash'

Simple words with more than two syllables are less common in Dusun. As previously noted, there is one idiosyncratic trisyllabic native word, namely /maʔamɛ/ 'butterfly'. Other trisyllabic or quadrisyllabic words are typically loanwords, as shown in Table 4.16.

Table 4.16: Simple words with more than two syllables in Dusun

Syllable type	Example	Gloss	Origin
V.CV.CV	/u.ta.ɣɛ/	'north'	< Sanskrit
V.CV.CVC	/a.ɣə.naʔ/	'rabbit'	< Arabic
CV.CV.CV	/ba.si.ka/	'bicycle'	< English
CV.CV.CVC	/ma.jə.ɣiŋ/	'margarine'	< English
CVC.CV.CVC	/ləm.pu.yaŋ/	'ginger plant'	
CCV.CV.VC	/stu.ka.iŋ/	'stocking'	< English
CV.CV.CV.CVC	/ta.lɛ.bi.sɛiŋ/	'television'	< English

/utaɣɛ/ 'north' and /aɣənaʔ/ 'rabbit' are ultimately borrowed from Sanskrit and Arabic, presumably having entered ITM via SM (cf. SM *utara* and *arnab*). Some clear English loanwords are also trisyllabic or quadrisyllabic, e.g., /basika/ 'bicycle' (cf. SM *basikal*), /majəɣiŋ/ 'margarine', /stukaiŋ/ 'stocking' and /talɛ-bisɛiŋ/ 'television' (also /tibi/). /ləmpuyaŋ/ 'ginger plant' is also likely borrowed, as suggested by the unexpected /-m.p-/ sequence (see §4.6), but the source remains unclear.

4.4.2 Structure of derivatives

Dusun has a smaller inventory of affixes compared to KM and CTM (see §5.3.1). Derivatives are typically disyllabic and prefixed, as shown in Table 4.17. All prefixed disyllables have an initial CC cluster, and they share the maximal template CCVC.CVC with simple words.

Table 4.17: Disyllabic derivatives in Dusun

Syllable type	Example	Morphological structure	Gloss	
CCV.V	/bɣa.i/	*bɣ-ai*	(INTR-water)	'watery'
CCV.VC	/ssa.iŋ/	*s-saiŋ*	(INTR-friend)	'to befriend'
CCV.CV	/tba.kɔ/	*t-bakɔ*	(NVOL-burn)	'to be burnt'
CCV.CVC	/jja.laŋ/	*j-jalaŋ*	(INTR-road)	'to walk'
CCVC.CV	/ttiŋ.ga/	*t-tiŋga*	(NVOL-leave)	'to be left behind'
CCVC.CVC	/ŋŋam.baʔ/	*NN$_1$-ambaʔ*	(IPFV-chase)	'chasing'

As in KM and CTM, there are some examples of prefixed trisyllables with *bə-* 'INTR; MID' in Dusun, all of which have bases with initial non-geminate clusters, typically consisting of an obstruent and a liquid, as shown in (4).

(4)

/bə.tɣa.bu/	*bə-tɣabu*	(MID-scattered)	'cluttered'
/bə.gli.sɔh/	*bə-glisɔh*	(MID-anxious)	'anxious'
/bə.cla.bũʔ/	*bə-clabũʔ*	(INTR-plop)	'to make a plop sound'
/bə.sli.muʔ/	*bə-slimuʔ*	(INTR-blanket)	'to cover (oneself) with a blanket'

Other trisyllabic derivatives in Dusun are often historically suffixed with a nominaliser *-aŋ* (cf. KM *-ɛ* and CTM *-aŋ*), as seen in (5). However, there are

only a few instances with this suffix, and the suffixing process is not active at the synchronic level. For example, *manis-aŋ* 'palm sugar' cannot be synchronically derived from *manih* 'sweet'. Following Collins (1983a: 57), I consider words with the *-aŋ* suffix as loanwords.

(5)	/u.ku.maŋ/	*ukum-aŋ*	(penalise-NMLS)	'penalty'
	/ma.ka.naŋ/	*makan-aŋ*	(eat-NMLS)	'food'
	/ma.ni.saŋ/	*manis-aŋ*	(sweet-NMLS)	'palm sugar'

A similar conclusion can be drawn for derivatives with more than three syllables, which seem to be historically circumfixed with *pə- -aŋ* (cf. KM *pə- -ɛ*, CTM *pə- -aŋ* and SM *pər- -an*), as in (6). These words also cannot be synchronically derived, as the hypothetical bases ˣmɔhɔn, ˣkapuŋ and ˣjaɲji are not attested.[26]

(6)	/pə.mɔ.hɔ.naŋ/	*pə-mɔhɔn-aŋ*	(NMLS-apply-NMLS)	'application'
	/pə.ka.pu.ŋan/	*pə-kapuŋ-aŋ*	(NMLS-village-NMLS)	'settlement'
	/pə.jaɲ.ji.aŋ/	*pə-jaɲji-aŋ*	(NMLS-agree-NMLS)	'agreement'

I conclude that as far as native words are considered, both simple words and derivatives in Dusun are canonically disyllabic. Additionally, a small number of morphologically simple monosyllables and trisyllables, as well as some prefixed trisyllables, are also attested.

4.4.3 Phoneme distribution at the word level

The following distributional patterns are summarised primarily based on the canonical disyllabic template, and the phonotactic constraints on the segment distributions apply to both simple words and derivatives.

4.4.3.1 Distribution of consonants

Distributional patterns of consonants at the word level in Dusun are comparable to those in KM and CTM, as displayed in Table 4.18.

[26] The native word for 'to apply' is /mitɔʔ/, and the attested forms for 'village' and 'to promise' are /kapəʊŋ/ and /jaɲjɛi/ with diphthongs.

Table 4.18: Distribution of consonants in Dusun at the word level

Position	p	b	t	d	c	j	k	g	ʔ	m	n	ɲ	ŋ	s	x	h	l	ɣ	w	y
initial	+	+	+	+	+	+	+	+	-	+	+	+	(+)	+	+	(+)	+	+	(+)	(+)
medial	+	+	+	+	+	+	+	+	-	+	+	+	+	+	-	+	+	+	+	+
final	-	-	-	-	-	-	-	-	+	-	-	-	+	-	-	+	-	-	-	-

(+ : attested, - : not attested, (+) : attested but uncommon)

Word-initially, a glottal stop is not phonemic. Word-initial /ŋ, h/ are typically found in function words, e.g., /ŋə/ 'ANAPH', /ŋaŋ/~/dəŋaŋ/ 'with; and' and /ŋaʔ/~/saŋaʔ/ 'very', /hɔʔ/~/haʔ/ 'REL' and /hɔ̃/ 'AFF'. There are only a few content words with initial /ŋ/ or /h/, i.e., /ŋaŋɛ/ 'to open wide', /hagɛ/ 'price', /hatɛ/ 'property' and /humbaŋ/ 'to throw'.[27] Initial glides /w, y/ are mostly restricted to shortened variants of some disyllables, as in /wɛi/~/buwɛi/ 'to give', /wɔh/~/buwɔh/ 'fruit' and /ya/~/iya/ 'ringgit (currency)', but they also occur in one disyllable /wayaʔ/ 'to tell'. Initial /x/ is attested but only when it is followed by a high vowel /i/ or /u/, e.g., /xitɛ/ 'car' and /xusɛi/ 'chair'; elsewhere it occurs geminated.

Word-medially, /ʔ/ and /x/ are not permitted. Unlike in KM and CTM, where a word-medial /-h-/ is only allowed between alike vowels, /-h-/ in Dusun is also found between two dissimilar vowels, e.g., /pahuŋ/ 'tree', /pahɛ/ 'thigh' and /lahi/~/lihi/ 'neck'.

Word-finally, only /ʔ, ŋ, h/ are allowed.

4.4.3.2 Distribution of vowels

The distribution of oral vowels in Dusun at the word level is presented in Table 4.19.

[27] /hagɛ/ 'price' and /hatɛ/ 'property' have variants /ɣəgɛ/ and /ɣətɛ/, which seem to be the more conservative pronunciations. /hagɛ/ and /hatɛ/ are probably the pronunciations under the influence of SM cognates *harga* and *harta*, ultimately from Sanskrit *argha* and *artha*. Initial /h/ in /humbaŋ/ 'to throw' is unexplained.

Table 4.19: Distribution of oral vowels in Dusun at the word level

Position	a	i	u	ɛ	ɔ	ə	ɛi	əʊ
penultimate	+	+	+	(-)	(-)	+	-	-
final	+	+	+	+	+	-	+	+

(+ : attested, - : not attested, (+): attested but uncommon)

In penultimate syllables, only /a, i, u, ə/ are generally allowed. However, some contracted forms and loanwords exhibit a deviant pattern. For instance, a mid vowel /ɔ/ is found in words like /mɔʔciʔ/ 'auntie' < *mɔʔ* 'mother' + *ciʔ* 'sister', and /wɔʔki/~/waʔki/ 'representative (n.)' < Arabic *wakīl*. A mid vowel /ɛ/ is attested in /lɛnɛiŋ/ 'now', derived from *kala* 'time' (< Sanskrit *kāla*) + *nɛiŋ* 'DEM.PROX'. Furthermore, while the schwa /ə/ is permitted in penultimate syllables, it does not occur word-initially. In final syllables, all oral vowels expect for the schwa /ə/ are allowed.

Nasal vowels are only attested in final syllables.

4.5 Consonant clusters

Table 4.20 presents attested consonant clusters C_1C_2 in Dusun, with C_1 indicated on the left on the vertical line, and C_2 on the top on the horizontal line. Clusters enclosed in parentheses are infrequent, either representing variants of other clusters or limited to loanwords.

C_1 and C_2 can be either identical or different, and all consonants except for the glottals /h, ʔ/ can occur in a consonant cluster. Non-geminate clusters in Dusun can be further classified into six groups based on their components: 1) obstruent + liquid; 2) obstruent + obstruent; 3) obstruent + nasal; 4) nasal + obstruent; 5) nasal + liquid; and 6) obstruent + glide. Examples for each type of clusters are given from (7) to (13).

Table 4.20: Attested consonant clusters in Dusun

C_1 \ C_2	p	b	t	d	c	j	k	g	m	n	ɲ	ŋ	s	x	l	ɣ	w	y
p	pp	-	-	pd	pc	-	-	pg	-	-	-	-	-	-	pl	pɣ	(pw)	
b	-	bb	bt	bd	-	bj	-	bg	-	-	-	-	-	-	bl	bɣ	bw	(by)
t	tp	tb	tt	-	-	tj	tk	tg	tm	tn	-	tŋ	ts	-	tl	tɣ	(tw)	-
d	-	-	-	dd	-	-	-	-	-	-	-	-	-	-	(dl)	dɣ	dw	-
c	cp	-	-	-	cc	-	ck	-	cm	-	-	-	-	-	cl	cɣ	(cw)	-
j	-	-	-	-	-	jj	-	-	jm	jn	-	-	-	-	jl	jɣ	-	-
k	-	-	-	kd	-	-	kk	-	-	kn	-	-	-	-	kl	(kɣ)	(kw)	-
g	-	-	-	-	-	-	-	gg	-	-	-	-	-	-	gl	(gɣ)	gw	-
m	-	mb	-	-	-	-	-	-	mm	-	-	-	-	-	ml	mɣ	-	-
n	-	-	-	-	-	-	-	-	-	nn	-	-	-	-	-	-	-	-
ɲ	-	-	-	-	-	-	-	-	-	-	ɲɲ	-	-	-	-	-	-	-
ŋ	-	-	-	-	-	-	-	-	-	-	-	ŋŋ	-	-	-	-	-	-
s	sp	sb	st	sd	sc	sj	sk	sg	sm	sn	-	-	ss	-	sl	sɣ	(sw)	-
x	-	-	-	-	-	-	-	-	-	-	-	-	-	xx	-	-	-	-
l	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ll	-	-	-
ɣ	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ɣɣ	-	-

(- : not attested, ( ) : attested but uncommon)

First, all segments except for the glottals and glides are attested in a geminate cluster, as exemplified in (7).

(7) Geminate clusters

/pp-/	/ppalɛ/	'head'
/bb-/	/bbalɔh/	'to fight'
/tt-/	/ttuwaʔ/	'warts'
/dd-/	/ddiɣɛi/	'to stand'
/cc-/	/ccayɛ/	'to believe'
/jj-/	/jjaɲjɛi/	'to promise'
/kk-/	/kkatɔʔ/	'frog'
/gg-/	/ggajɛi/	'saw (n.)'
/mm-/	/mmipɛi/	'to dream'
/nn-/	/nnatɔŋ/	'animal'

/ɲɲ-/	/ɲɲapəʊ/	'broom'
/ŋŋ-/	/ŋŋali/	'to flow'
/ss-/	/ssəjiʔ/	'mosque'
/xx-/	/xxətah/	'paper'
/ll-/	/llakɛi/	'male'
/ɣɣ-/	/ɣɣəbəʊʔ/	'cupboard'

Second, the most common non-geminate clusters consist of an obstruent followed by a liquid, as in the following examples:

(8) Obstruent + liquid

/pl-/	/plitɛ/	'lamp'
/pɣ-/	/pɣaŋa/	'behaviour'
/bl-/	/blakɛ/	'all'
/bɣ-/	/bɣətɛi/	'to stop'
/tl-/	/tliŋɛ/	'ear'
/tɣ-/	/tɣimɛ/	'to receive'
/dl-/	/dlimɛ/	'pomegranate'
/dɣ-/	/dɣakɛ/	'insubordinate'
/cl-/	/clabũʔ/	'plop'
/cɣ-/	/cɣəmiŋ/	'mirror'
/jl-/	/jlagɛ/	'soot'
/jɣ-/	/jɣənih/	'clear'
/kl-/	/kladɛi/	'taro'
/kɣ-/	/kɣaniŋ/	'clerk'
/gl-/	/glabɛ/	'spider'
/gɣ-/	/gɣəbɔŋ/	'(hair) spread out'
/sl-/	/sluwɔ/	'trousers'
/sɣ-/	/sɣatuh/	'one hundred'

As in KM and CTM, there is a tendency in Dusun to avoid a stop and a liquid in such combinations sharing the same place of articulation, but there are some exceptions. /dl-/ is attested in one instance /dlimɛ/ 'pomegranate'. /kɣ-/ and /gɣ-/ are recorded in younger speakers' speech, e.g., /kɣaniŋ/ 'clerk' and /gɣəbɔŋ/ '(hair) spread out', but these words are pronounced with /xx-/ and /ɣɣ-/ among older speakers, i.e., /xxaniŋ/ and /ɣɣəbɔŋ/. I take the pronunciation of /kɣ-/ and /gɣ-/ as a result of SM's influence (cf. SM *kərani* and *gərbaŋ*), hence marked by parentheses in Table 4.20.

The third type of clusters consists of an obstruent followed by another obstruent, which are much more common in Dusun than in KM and CTM, as illustrated in (9).

(9) Obstruent + obstruent

/pd-/	/pdiyɛ/	'who'
/pc-/	/pcumɛ/	'free'
/pg-/	/pguwaŋ/	'lawyer'
/bt-/	/btəmuŋ/	'to meet'
/bd-/	/bdiɣɛ/	'flag'
/bj-/	/bjəɣəʊʔ/	'soaking wet'
/bk-/	/bkabuh/	'foggy'
/bg-/	/bgəɣɔʔ/	'to depart'
/tp-/	/tpakɛ/	'be forced to'
/tb-/	/tbuwaŋ/	'hornet'
/tj-/	/tjatəʊh/	'to fall (unintentionally)'
/tk-/	/tkəjuʔ/	'to be startled'
/tg-/	/tgaɣɛ/	'southeast'
/ts-/	/tsakuʔ/	'to be hung'
/cp-/	/cpədɔʔ/	'cempedak'
/ck-/	/ckalɛiʔ/	'to smash'
/kd-/	/kdiyaŋ/	'later'
/sp-/	/spuləʊh/	'ten'
/sb-/	/sbəlah/	'eleven'
/st-/	/stəŋɔh/	'half'
/sd-/	/sdiɣɛi/	'on one's own'
/sc-/	/scawaŋ/	'a cup'
/sj-/	/sjabi/	'a pouch'
/sk-/	/skulɔh/	'school'
/sg-/	/sgəlah/	'a glass'

Three segments are most commonly attested as C_1 in this type of clusters, namely /b, t, s/, which often represent the prefix *b-* 'INTR; MID', *t-* 'NVOL' or the clitic *s=* 'a; one; same'. Stop + stop clusters usually consist of a voiceless stop and a voiced stop, or two voiceless stops, but there are some exceptions. The voiced stop /b-/ is sometimes followed by a voiceless stop, as in /btəmuŋ/ *b-təmuŋ* (MID-meet) 'to meet' and /bkabuh/ *b-kabuh* (INTR-fog) 'foggy', but these forms typically alternate with forms with a geminate

cluster, i.e., /ttəmuŋ/ and /kkabuh/. For the allomorphic realisations of prefixes, see §5.3.1.1.

The fourth type of clusters consists of an obstruent followed by a nasal, as listed (10).

(10) Obstruent + nasal

/tm-/	/tmakɔ/	'tobacco'
/tn-/	/tnagɛ/	'energy'
/tŋ-/	/tŋəlaŋ/	'to sink'
/cm-/	/cmuɣəʊ/	'jealous'
/jm-/	/jmalɔŋ/	'earth gnome'
/jn-/	/jnamɛ/	'brand'
/kn-/	/knuɣɛi/	'feast'
/sm-/	/smayɔŋ/	'to pray'
/sn-/	/snaɣa/	'list'

Some of these examples exhibit variation between a non-geminate cluster and a geminate cluster, as in /tmabɔ/~/mmakɔ/ 'tobacco' and /smayɔŋ/~/mmayɔŋ/ 'to pray'.

The fifth type of clusters, in which a nasal is followed by an obstruent, is only found as /mb-/, attested in two monosyllabic words in (11). ˣ/nd-/ or ˣ/ŋg-/ is not attested.

(11) Nasal + obstruent

/mb-/	/mbuh/	'to blow'
/mb-/	/mbuŋ/	'dew'

The combinations of a nasal and a liquid are found in /ml-/ and /mɣ-/, as illustrated by examples in (12).

(12) Nasal + liquid

/ml-/	/mlayəʊ/	'Malay'
/ml-/	/mlaɣɛ/	'traveller'
/mɣ-/	/mɣatɛ/	'prevalent'

The last type of clusters consists of an obstruent followed by a glide /w/ or /y/, as demonstrated in (13).

(13) Obstruent + glide

/pw-/	/pwasɛ/	'to fast'	< Sanskrit *upavāsa*	cf. SM *puasa*
/bw-/	/bwayɛ/	'crocodile'		
/tw-/	/twala/	'towel'	< Portuguese *toalha*	cf. SM *tuala*
/dw-/	/dwanɛ/	'where'		
/cw-/	/cwacɛ/	'climate'	< Sanskrit *svaccha*	cf. SM *cuaca*
/kw-/	/kwalɛi/	'wok'	< Tamil *kuvaḷai*	cf. SM *kuali*
/gw-/	/gwanɛ/	'how'		
/sw-/	/swaɣɛ/	'voice'	< Sanskrit *svara*	cf. SM *suara*
/by-/	/byasɛ/	'usual'	< Sanskrit *abhyāsa*	cf. SM *biasa*

This type of clusters is often found in loanwords, as indicated above, but it is also attested in at least three native words, namely /bwayɛ/ 'crocodile', /dwanɛ/ 'where' and /gwanɛ/ 'how' (cf. SM *buaya*, *di mana* and *bagai-mana*). This suggests that the pattern of a cluster comprising an obstruent followed by a glide is generally permissible in Dusun; these clusters are thus included in Table 4.20.

To summarise, Dusun attests a broader range of consonant clusters when compared to KM and CTM. Although the general patterns of clustering are similar, and the SSP can still be seen as playing a central role in governing permissible clusters, it appears to be applied with slightly more flexibility in Dusun. Notable exceptions include clusters consisting of a voiced stop and a voiceless stop, as found in derivatives such as /btəmuŋ/ *b-təmuŋ* (MID-meet) 'to meet' and /bkabuh/ *b-kabuh* (INTR-fog) 'foggy'. These clusters are nevertheless subject to regressive assimilation to become geminates, which also highlights the effect of the SSP.

4.6 Consonant sequences

The most common consonant sequences in Dusun are homorganic nasal + voiced stop sequences, namely /-m.b-, -n.d-, -ɲ.j-, -ŋ.g-/, as demonstrated by the examples in Table 4.21. Nasal + voiceless stop sequences are not allowed in native words.

Table 4.21: Homorganic nasal + voiced stop sequences in Dusun

Sequence	Example	Gloss
/-m.b-/	/tim.bu/	'to float'
	/am.bɛiʔ/	'to take'
/-n.d-/	/pan.da/	'clever'
	/mən.dɛ/	'what'
/-ɲ.j-/	/aɲ.jɛiŋ/	'dog'
	/blaɲ.jɛ/	'expense; bride price'
/-ŋ.g-/	/tiŋ.gɛi/	'tall'
	/tuŋ.gəʊ/	'to wait'

Dusun also permits sequences with a fricative /s/ followed by another consonant, as in /-s.t-/ in /məs.tɛ/~/mis.tɛ/ 'mangosteen', /-s.k-/ in /mis.kiŋ/ 'poor' and /-s.n-/ in /is.na/ 'Monday'. Such sequences are not attested in either KM or CTM, and as mentioned earlier in §4.3, they may have been borrowed.

Another type of sequences in Dusun consists of a glottal stop directly followed by another consonant, as listed in Table 4.22.

Table 4.22: /-ʔ.C-/ sequences in Dusun

Sequence	Example	Gloss	Origin
/-ʔ.p-/	/baʔ.pɛ/	'why'	< *buwaʔ* 'do' + †*apa* 'what'
/-ʔ.t-/	/saʔ.təʊ/	'Saturday'	< Arabic *sabt*
/-ʔ.d-/	/taʔ.dɛi/	'just now'	
/-ʔ.c-/	/mɔʔ.ciʔ/	'auntie'	< *mɔʔ* 'mother' + *ciʔ* 'sister'
/-ʔ.k-/	/biʔ.kɛi/	'to repair'	
/-ʔ.g-/	/kiʔ.gɛi/	'later'	
/-ʔ.m-/	/suʔ.mu/	'always'	< *s=* 'same' + *umu* 'age'
/-ʔ.n-/	/saʔ.nɛiŋ/	'just now'	< *saʔãʔ* 'second' + *nɛiŋ* 'DEM.PROX'
/-ʔ.s-/	/piʔ.sɛ/	'examination'	< Sanskrit *parīkṣā*

† indicates earlier forms which are no longer attested.

Several origins can be identified for words with this type of sequences: (historically) contracted forms, loanwords or historically suffixed forms.

The origins for contracted forms and loanwords are indicated in Table 4.22. /biʔkɛi/ 'to repair' is a historically suffixed form (cf. SM *baik-i* 'good-APPL'; /-ɛi/ in Dusun /biʔkɛi/ corresponds to SM *-i* 'APPL'. /taʔdɛi/ 'just now' and /kiʔgɛi/ 'later' have unexplained /-ʔ.d-/ and /-ʔ.g-/ sequences.

4.7 Vowel sequences

Table 4.23 presents the vowel sequences found in Dusun.

Table 4.23: Vowel sequences in Dusun

Sequence	Example	Gloss
/a.i/	/a.i/	'water'
/a.u/	/ta.u/	'to know'
/a.ĩ/	/matɛ ka.ĩ/	'fish hook'

In total there are only three recorded vowel sequences, all of which begin with the low vowel /a/. Among the vowels that are generally allowed in penultimate syllables (/a, i, u, ə/), the schwa /ə/ cannot be directly followed by another vowel. The high vowel /i/ and /u/ also do not occur as the first component in a vowel sequence, as potential sequences like ˣ/iV/ and ˣ/uV/ are analysed as having a corresponding phonemic glide, i.e., /iyV/ and /uwV/, as in /liyaʔ/ 'to see', /diyɛ/ '3SG', /buwaʔ/ 'to do' and /buwɛih/ 'foam'. This analysis is supported by alternations observed in words such as /waʔ/~/buwaʔ/ 'to do', /wɔh/~/buwɔh/ 'fruit' and /ya/~/iya/ 'ringgit (currency)', where the shortened monosyllabic forms preserve an initial glide. Other logical combinations of /a/ + another vowel, such as ˣ/aɛ/ and ˣ/aɔ/, are also not attested.

4.8 Stress

Stress is not phonemic in Dusun. In disyllabic words, stress is fairly consistently placed on the final syllable, whether that syllable is open or closed. This pattern is shown in the following examples:

(14)

Final open syllables		
/pata/	[paˈta]	‘beach’
/matɛ/	[mãˈtɛ]	‘eye’
/layɔ/	[laˈyɔ]	‘to sail’
/kati/	[kaˈti]	‘bed’
/kiɣɛi/	[kiˈɣɛi̯]	‘left (side)’
/batəʊ/	[baˈtəu̯]	‘stone’
Final closed syllables		
/sakiʔ/	[saˈkiʔ]~[saˈkɪi̯ʔ]	‘sick’
/muluʔ/	[mũˈluʔ]~[mũˈləu̯ʔ]	‘mouth’
/taɣɛiʔ/	[taˈɣæɛ̯ʔ]	‘to pull’
/katəʊʔ/	[kaˈtɐɔ̯ʔ]	‘to hit’
/awaŋ/	[aˈwaŋ]	‘cloud’
/bitɔŋ/	[biˈtɑŋ]	‘star’
/musɛiŋ/	[mũˈsæɛ̯ŋ]	‘season’
/idəʊŋ/	[iˈdɐɔ̯ŋ]	‘nose’
/tikuh/	[tiˈkuh]~[tiˈkəu̯h]	‘rat’
/miɣɔh/	[mĩˈɣɔh]	‘red’
/putɛih/	[puˈtæɛ̯h]	‘white’
/tujəʊh/	[tuˈjɐɔ̯h]	‘seven’

This pattern of stress placement aligns with the observation that more vowels are permitted in final syllables and that more phonemic contrasts are found in this position, suggesting a higher prominence of final syllables. The exclusive occurrence of diphthongs in final syllables is also likely connected to final-syllable stress. Diachronically, diphthongs in Dusun developed from earlier high vowels (/ɛi/ < *i and /əʊ/ < *u, see more in §7.4.4), and it is plausible that only stressed high vowels were diphthongised. Synchronically, the interaction between diphthongisation and stress further affects other high vowels in final closed syllables, as illustrated by examples such as /sakiʔ/ [saˈkiʔ]~[saˈkɪi̯ʔ] ‘sick’ and /muluʔ/ [muˈluʔ]~[muˈləu̯ʔ] ‘mouth’.[28]

Exceptions to the general pattern of stressing final syllables can be found in words with initial geminates, where the stress is often placed on the initial syllable. The following words are commonly pronounced with initial stress:

[28] Kerinci, another Malayic variety spoken in Sumatra, has diphthongs in final syllables with similar origins, which also cooccur with ultimate stress (Steinhauer & Usman 1978; Steinhauer 2002).

(15)	/llakɛi/	[ˈllakɛi̯]	‘male’
	/ŋŋali/	[ˈŋŋãli]	‘to flow’
	/nnatɔŋ/	[ˈnnãtɑŋ]	‘animal’
	/jjalaŋ/	[ˈjjalaŋ]	‘to walk’
	/ŋŋuaʔ/	[ˈŋŋũwãʔ]	‘to yawn’

However, the association between initial geminates and initial stress is not always consistent, as some other words with initial geminates may be pronounced with stress on the final syllables, e.g., /mmaɣɛiŋ/ [mmãˈɣæɛ̯ŋ] ‘yesterday’ and /ɲɲusuʔ/ [ɲɲũˈsuʔ]~[ɲɲũˈsəu̯ʔ] ‘to hide’.

To sum up, stress is not phonemic in Dusun, and the final syllable of disyllabic words is typically stressed. Words with initial geminates may have stress on the initial syllable, although this pattern is not always consistent.

4.9 Summary

This chapter has described the phonology of ITM spoken in Kampung Dusun and compared it with the phonologies of KM and CTM.

Dusun has a consonant inventory consisting of twenty native phonemic consonants and a vowel inventory of ten phonemic monophthongs, which include six oral vowels /a, i, u, ɛ, ɔ, ə/ and four nasal vowels /ã, ĩ, ũ, õ/. It also has two phonemic diphthongs /ɛi/ and /əʊ/. The phonetic realisations of oral vowels are particularly complex, with conditioning environments that involve the presence and nasality of the onset consonant, as well as the presence of the coda consonant. Following a nasal consonant, all oral vowels are nasalised phonetically. In addition, the mid front vowel /ɛ/ is raised to [ĩ]~[ẽ] when following nasals, and the mid back vowel /ɔ/ is lowered to [ɑ] when preceding a velar nasal /ŋ/. The high vowels /i, u/ have a tendency to be diphthongised in final closed syllables, and the diphthongs /ɛi, əʊ/ are lowered to [æɛ̯, ɐɔ̯] respectively in closed syllables. The nasal vowels, on the other hand, are consistently realised with nasality, although their presence is limited.

The basic syllable structure in Dusun is (C)(C)V(C). All segments can be an onset (with the glottal stop /ʔ/ having a restricted occurrence), whereas in coda position, only the glottals /ʔ, h/, the nasals /m, n, ɲ, ŋ/ and the fricative /s/ are permitted. A complex onset cluster CC can consist of either

two identical segments or dissimilar ones, and variation is sometimes observed between geminate and non-geminate clusters. All segments except for the glottals /ʔ, h/ can occur in a consonant cluster, but the glides /w, y/ only occur in non-geminate clusters. Attested non-geminate clusters generally comply with the SSP, but some exceptions exist, typically resulting from the process of prefixation. Regarding vowels, a nucleus V can be either a monophthong or a diphthong. Not all vowels can cooccur with an onset and/or a coda, as there are many restrictions on their distribution at the syllable level. The schwa and the diphthongs do not occur in onsetless syllables, and the mid front vowel /ɛ/ only appears in open syllables. Following a complex onset CC, only /a, i, u, ə/ are allowed. Nasal vowels often occur in closed syllables with a coda /ʔ/.

Words in Dusun typically follow a disyllabic structure with a (C)(C)V(C). (C)V(C) pattern, which applies to both morphologically simple words and derivatives. Additionally, a small number of monosyllabic simple words and trisyllabic derivatives are also attested. In word-initial position, /ʔ/ is not phonemic, and /ŋ, h, w, y/ also have limited presence. /ʔ, x/ do not occur in word-medial intervocalic position, and only /ʔ, h, ŋ/ are permitted in word-final position. Consonant clusters typically occur word-initially, except in a few instances of trisyllabic prefixed forms where they occur in penultimate onset position. In disyllabic words, only /a, i, u, ə/ are generally allowed in penultimate syllables, whereas the schwa is not permitted in final syllables. Most word-medial sequences are homorganic nasal + voiced stop sequences, but Dusun also allows some /-ʔ.C-/ sequences, as well as /-s.C-/ sequences in a few examples. In vowel sequences formed by two adjacent vowels, the first one can only be /a/.

Dusun does not have phonemic stress. Word stress is largely predictable, typically falling on the final syllable in disyllabic words. Ultimate stress can also be associated with the large inventory of vowels permitted in final syllables and the tendency for high vowels to diphthongise in this position.

4.10 Comparison of NEPM phonologies

So far, I have described the phonology of all three varieties of NEPMs, and it is evident that there are many strikingly similar features characterising NEPMs as a whole. As regards the consonant systems, the inventories are

identical across all three varieties, and consonants also have nearly identical distributions, revealing a clear left-oriented consonantal asymmetry in syllable structure and word structure (Ogloblin 2018: 330). There are many restrictions on the distribution of consonants at the right edge of a syllable and a word: only the glottals /ʔ, h/ and the nasals /m, n, ɲ, ŋ/ are permitted in coda position (and possibly also /s/ in Dusun), among which only /ʔ, ŋ, h/ are allowed in word-final position. In contrast, the majority of consonants are permitted at the beginning of a word. Consonant clusters also attested in word-initial position, and they include geminates, which are cross-linguistically quite rare. NEPMs also share many similarities in syllable and word shapes. The basic syllable template is (C)(C)V(C), and words are generally disyllabic with a (C)(C)V(C).(C)V(C) shape. Similar generalisations can also be drawn for the patterns of permitted consonant clusters and consonant sequences in all three varieties, albeit with minor differences.

The main phonological differences among these varieties are primarily found in their vowel systems, with ITM (Dusun) displaying several peculiarities in particular. Unlike KM and CTM, Dusun lacks a contrast between mid-low and mid-high vowels, and the mid-vowels /ɛ, ɔ/ are generally not allowed in penultimate syllables. Furthermore, Dusun has two phonemic diphthongs, which contrast with all vowels except for /ə/ in final syllables. Each variety also has its own phonotactic constraints on vowel distribution. For example, a schwa is not allowed in final syllables in KM and Dusun, but it is permitted in final open syllables in CTM. Nonetheless, all three varieties share the feature of having phonemic nasal vowels, with words containing nasal vowels often being cognates.

Many phonological similarities observed across NEPMs at the synchronic level can be attributed to their shared historical development. A detailed examination of the evolution of their phonological systems will be provided in Chapter 7.