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A Sociolinguistic survey of the Watut Languages

South Watut [mcy], Middle Watut [mpl], and North Watut [una]

John Carter, John Grummitt, Janell Masters, and Brian Paris

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Abstract

This survey of South Watut [mcy], Middle Watut [mpl] and North Watut [una] in central Morobe Province, Papua New Guinea was requested by SIL-PNG Morobe Regional Directors in November 2011. The Directors desired to know the level of the vitality of the Watut vernaculars and what would be required to meet the language development needs of the Watut communities. The first goal of the survey was therefore to determine whether the Watut vernaculars had strong vitality. The second goal was to determine whether the Watut communities had interest in vernacular language development and Bible translation. The third goal was to determine how many ethnolinguistic groups could be involved in the program and their willingness to work together.

We conclude that all three language communities would benefit from a language development program, but that various challenges exist for each. An excellent first step for such a program would be to conduct a workshop in Lae, a gathering point for all three communities and a town they call their own. Additionally, there is sufficient unity between the three Watut Valley languages to indicate that they would likely be willing to cooperate in such a program.

If a program involving all three proves impractical, we recommend that a program be initiated in North Watut. Middle Watut is a second possibility, but a lack of ethnolinguistic unity could prove difficult. The geography of the South Watut area is prohibitive and their population more scattered; therefore a program is least feasible there.

Contents

1 Introduction

This survey was requested by the SIL-Papua New Guinea (PNG) Morobe Regional Directors in November 2011. The directors wanted a recommendation, based on vernacular vitality, as to whether a vernacular language development project was indicated for the Watut area. The directors also wanted to know what type of project would likely be most effective in the Watut area. Therefore, the first goal of the survey is to determine whether the Watut vernaculars have strong vitality. The second goal is to determine whether the Watut communities have interest in vernacular language development. The third goal is to determine how many ethnolinguistic groups could be involved in the project and whether they would be willing to work together.

The survey was conducted from 10–22 February, 2012, by John Carter, John Grummitt, Janell Masters and Brian Paris. The team began at the southern end of the research area, traveling to Dangal by helicopter. They travelled north, on foot and downriver by motorised canoe, surveying villages and hamlets speaking South Watut [mcy], Middle Watut [mpl], and North Watut [una].[1] The fieldwork was made possible by the support of the Papua New Guinea government, SIL-PNG, and the participation and hospitality of the communities of the Watut River Valley, to whom the survey team extends thanks.

The team's plans included visiting the following 12 villages: Dangal, Gumots, Wawas, Maralangko, Zinimb, Babuaf, Marauna, Bencheng, Dungutung, Morom, Uruf, and Mafanazo.[2] Difficult terrain and incomplete information caused us to bypass Gumots (called Bulaprik locally),[3] though we took a wordlist in Bubuparum, a self-proclaimed hamlet of Gumots. We did not visit Maralangko or Zinimb for the same reasons and chose to visit a hamlet of Morom called Onom due to the claim that the majority of the population belonging to Morom was in Onom. Finally, we visited Singono, a hamlet of Babuaf, because of its geographic distance from the latter.[4] Thus, the list of locations where some work was done—in the order visited—is Dangal, Bubuparum (hamlet of Gumots), Wawas, Madzim (the main hamlet of Babuaf), Marauna, Bencheng, Dungutung, Onom (hamlet of Morom), Uruf, Singono (hamlet of Babuaf) and Mafanazo.[5]

2 Background information

2.1 Language name and classification

Table 1 presents information about the vernaculars surveyed, according to the 16th edition of *Ethnologue: Languages of the world* (Lewis, 2009).

[1] ISO codes for languages mentioned in this report will only be included at the first mention of each. See table 1 for source of ISO codes.

[2] See appendix A for a complete list of locations and their relatedness.

[3] Reports on Gumots varied, but generally agreed that it was an area, rather than a village. According to some, a village called Bulaprik is the primary village within the Gumots area, and we treat the two as synonymous in this report.

[4] See section 4.4 for a detailed description of the team's travels and the decisions and circumstances which guided them.

[5] See table 9 in section 4.4 for a description of what work was completed where.

Table 1. *Ethnologue* classification of vernaculars relevant to this survey

Variety	ISO code	Classification	Dialects	Alternate names
Watut, South	[mcy]	Austronesian, Malayo-Polynesian, Central-Eastern, Eastern Malayo-Polynesian, Oceanic, Western Oceanic, North New Guinea, Huon Gulf, Markham, Watut	Maralango (Maralangko), Dangal (Danggal)	
Watut, Middle	[mpl]		none reported	Maraliinan, Maralinan, Silisili, Watut
Watut, North	[una]		Holzecht[6] says North Watut combines with Silisili and Maralinan (dialects of Middle Watut) to form one language, North Watut.	Onank, Unangg, Unank, Watut

2.2 Language locations

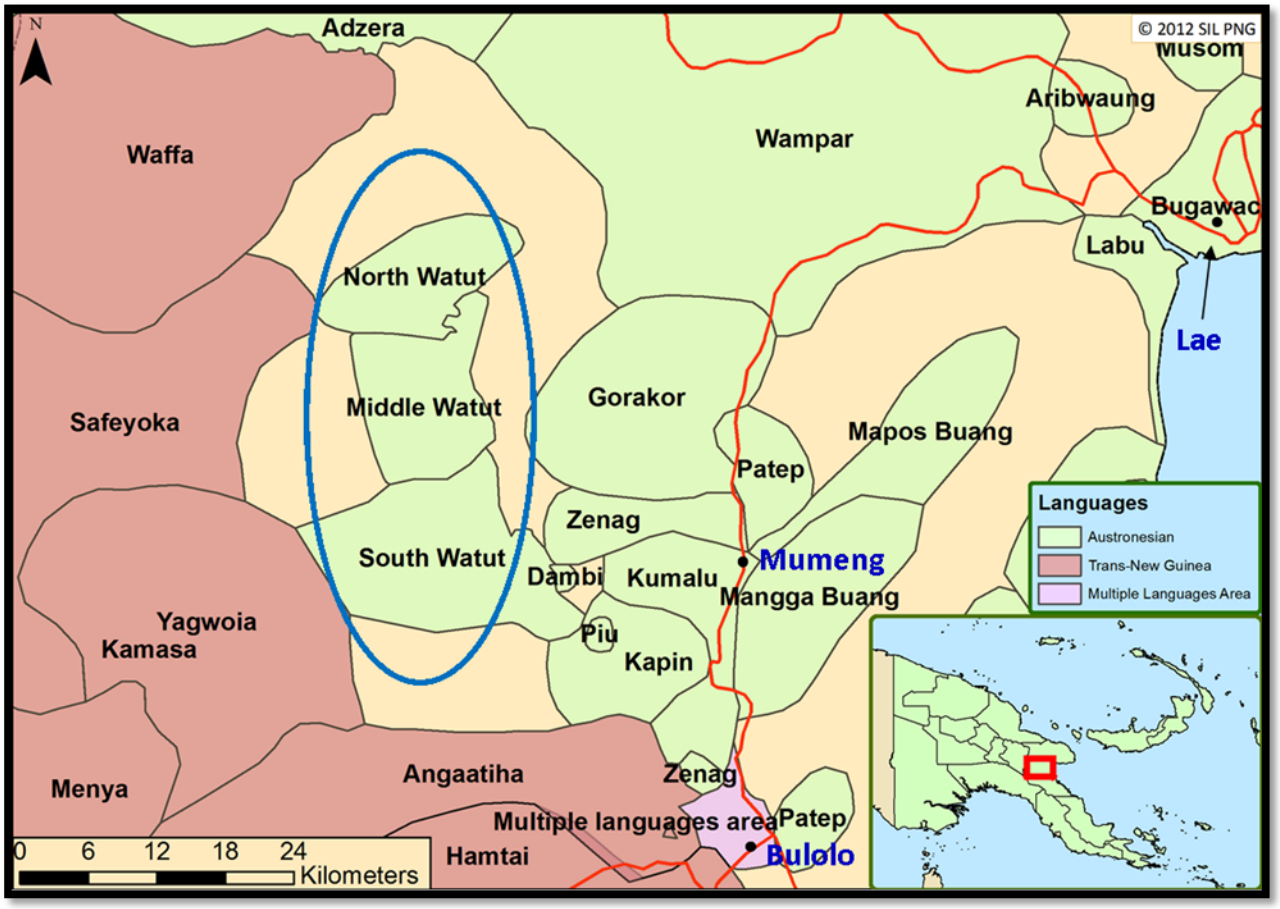
The Watut varieties are used by communities along the Watut River Valley in Morobe Province, Papua New Guinea (PNG). The Watut River runs mainly south-north some 40 kilometres east of the border with Eastern Highlands Province and roughly 60 kilometres west of Lae. The Watut empties into the Markham River near Nadzab Airfield. The source for maps 1–5 is SIL-PNG, 2012.

In map 1 the Watut language areas are circled in blue. The three towns most important to the communities are Lae, Mumeng and Bulolo (labeled in blue).

The Watut languages are the westernmost Austronesian languages in this area, and are bordered by Trans-New Guinea languages to the west. There is, however, virtually no contact with these groups due to geographical barriers and travel patterns north-south along the river (see map 2 for the river's route).

[6] We believe this *Ethnologue* spelling is an incorrect version of 'Holzknecht'.

Map 1. Watut languages in context



Note 1: This map and those below are a composite of data from numerous sources. The data from one source do not always match perfectly with that of another. For example, some of our GPS points show on the east side on the river just north of Dangal in maps below even though we never crossed the river there.

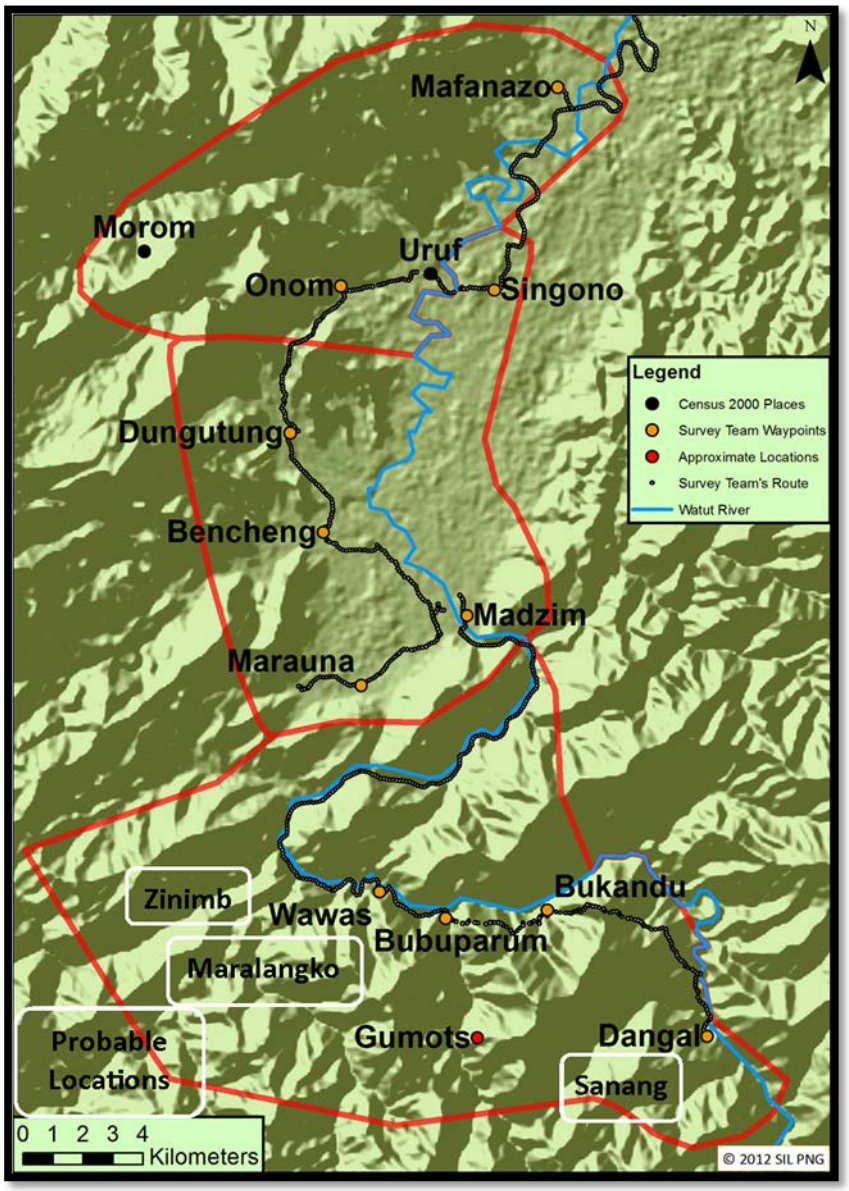
Note 2: These maps are not based upon land claims, nor should they be used to make such claims. Borders are intended to represent sociolinguistic groupings only.

Note 3: Spellings and locations are not always accurate, and the team can only vouch for the accuracy of those locations we visited. See appendix A.

There are thirteen villages in the Watut language subgroup, and they have many variant names in the literature. This document uses 2000 Census spellings (National Statistical Office 2002) throughout for clarity, but tables of alternate names are provided in appendix A. The 13 Watut villages are: Sanang, Dangal, Gumots, Wawas, Maralangko, Zinimb, Babuaf, Marauna, Bencheng, Dungutung, Morom, Uruf, and Mafanazo.

In the South Watut area the villages are in or surrounded by mountains, and the Watut River follows a narrow, twisting route, its precipitous descent resulting in many rapids. As the river enters the Middle Watut area it breaks out of the mountains and slows, and villages here and in North Watut are located in flat areas bordering the river, with the exception of Morom. The valley broadens, and the river, now meandering, is often surrounded by swampy areas, fading to *kunai* hills, then to steep, forested mountains behind. This geography can be visualized using map 2.

Map 2. Terrain and the team's route



Note 1: The location of Gumots was estimated using input from several sources.

Note 2: Locations marked 'approximate locations' are based on scanty evidence, but we believe it helpful to suggest where we think they are because the census points representing them are inaccurate.

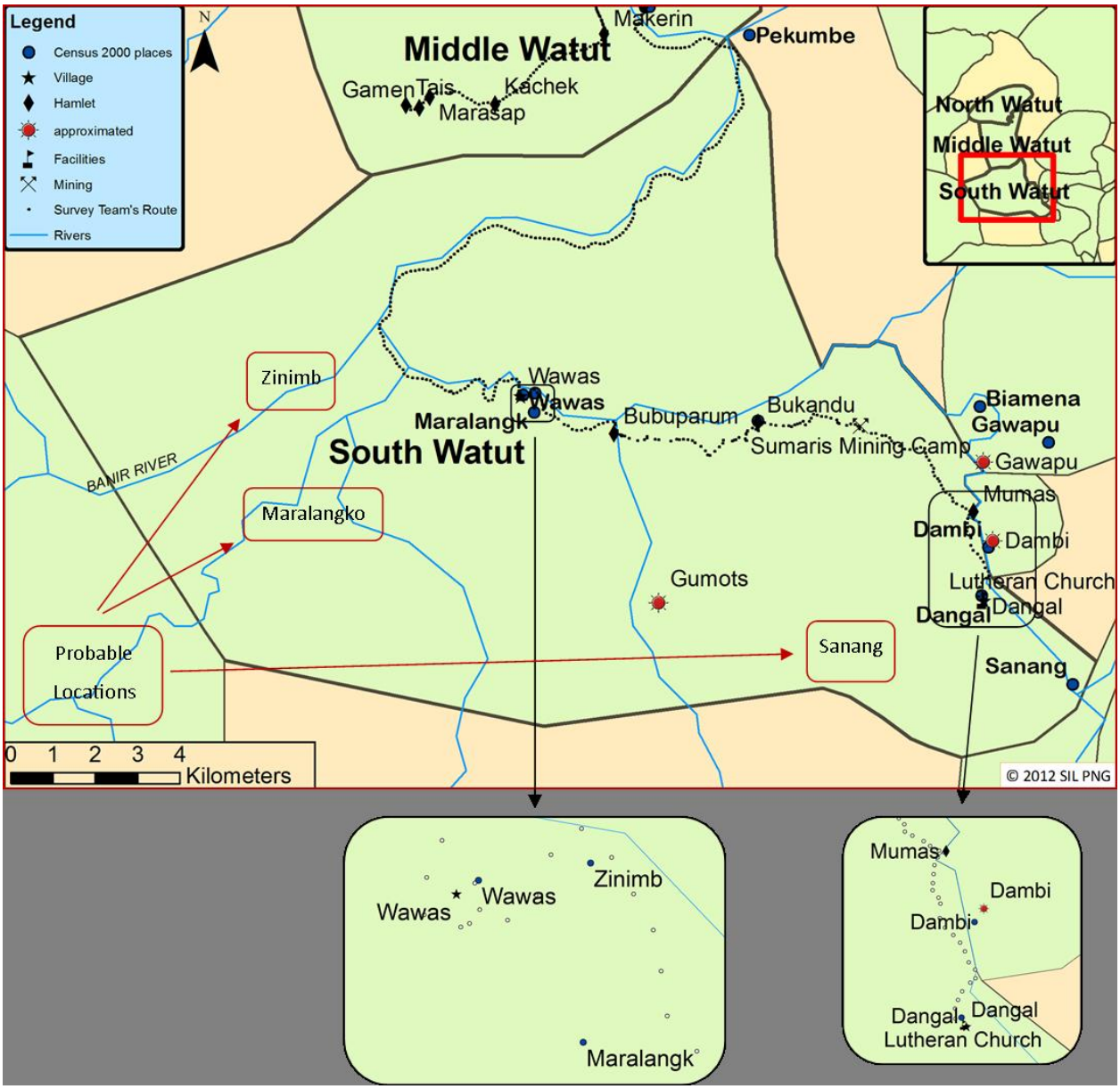
Note 3: Though there are other rivers in this area, only the Watut is depicted for clarity.

Maps 3, 4, and 5 show each language area in detail. As noted above, our data and previously gathered data did not always align perfectly. For example, Mumas, a hamlet of Dangal, is on the west side of the river, not the east as is shown in the inset of map 3.

Also as noted, census points do not necessarily correspond to the current locations of villages. In map 3, for example, the census points of Zinimb and Maralangko are depicted close to Wawas, but they are probably located in the red rectangles designated 'probable locations'.

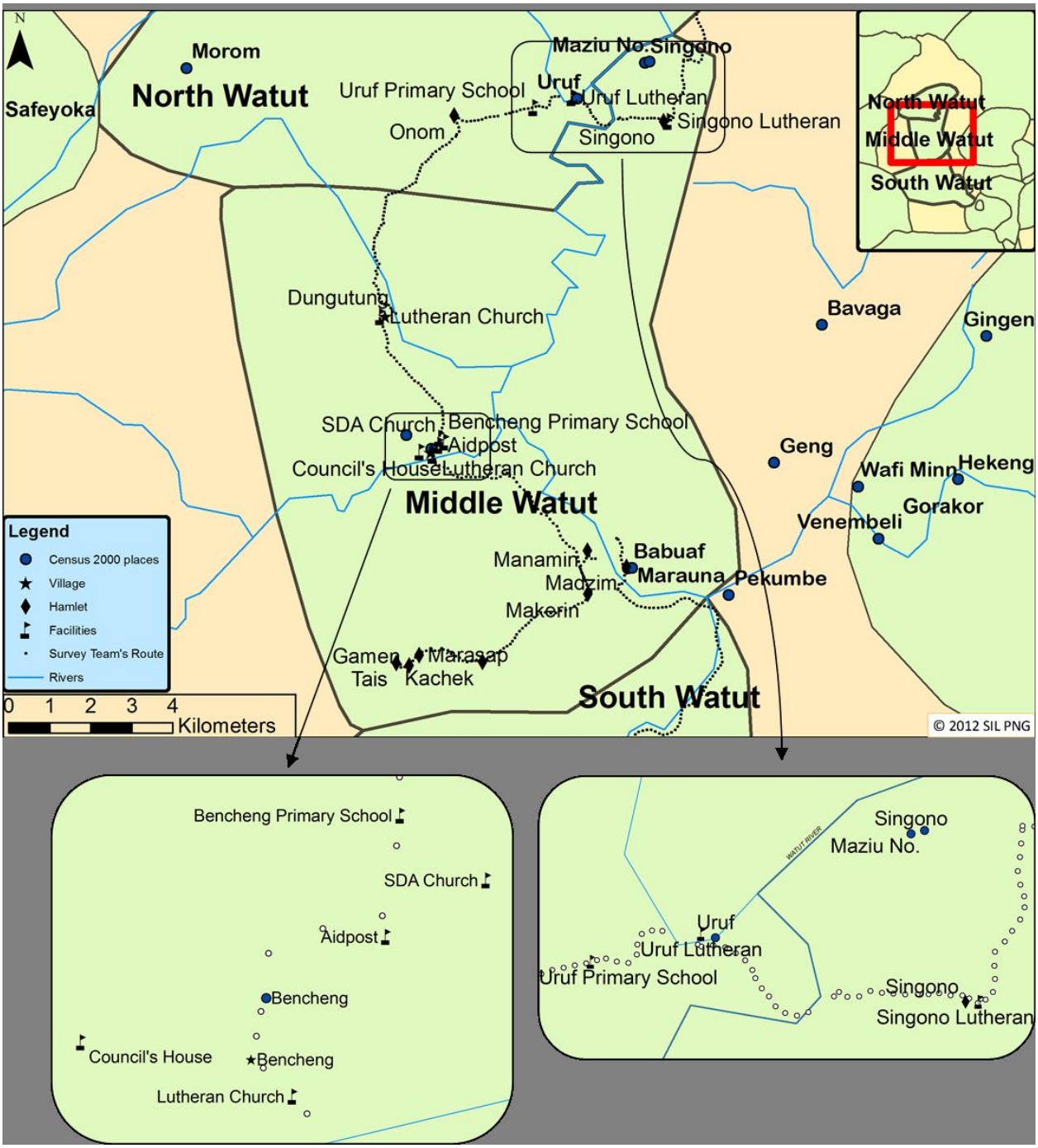
From Wawas to the Middle Watut area the team travelled by motorised canoe on the river. The points marking our route accurately depict the course of the Watut River today along this stretch.

Map 3. South Watut



Several of the Middle Watut villages are spread out in a series of hamlets. These include Babuaf, extending from Madzim all the way to Singono, and Marauna, which is spread out between Tais and Manamin.

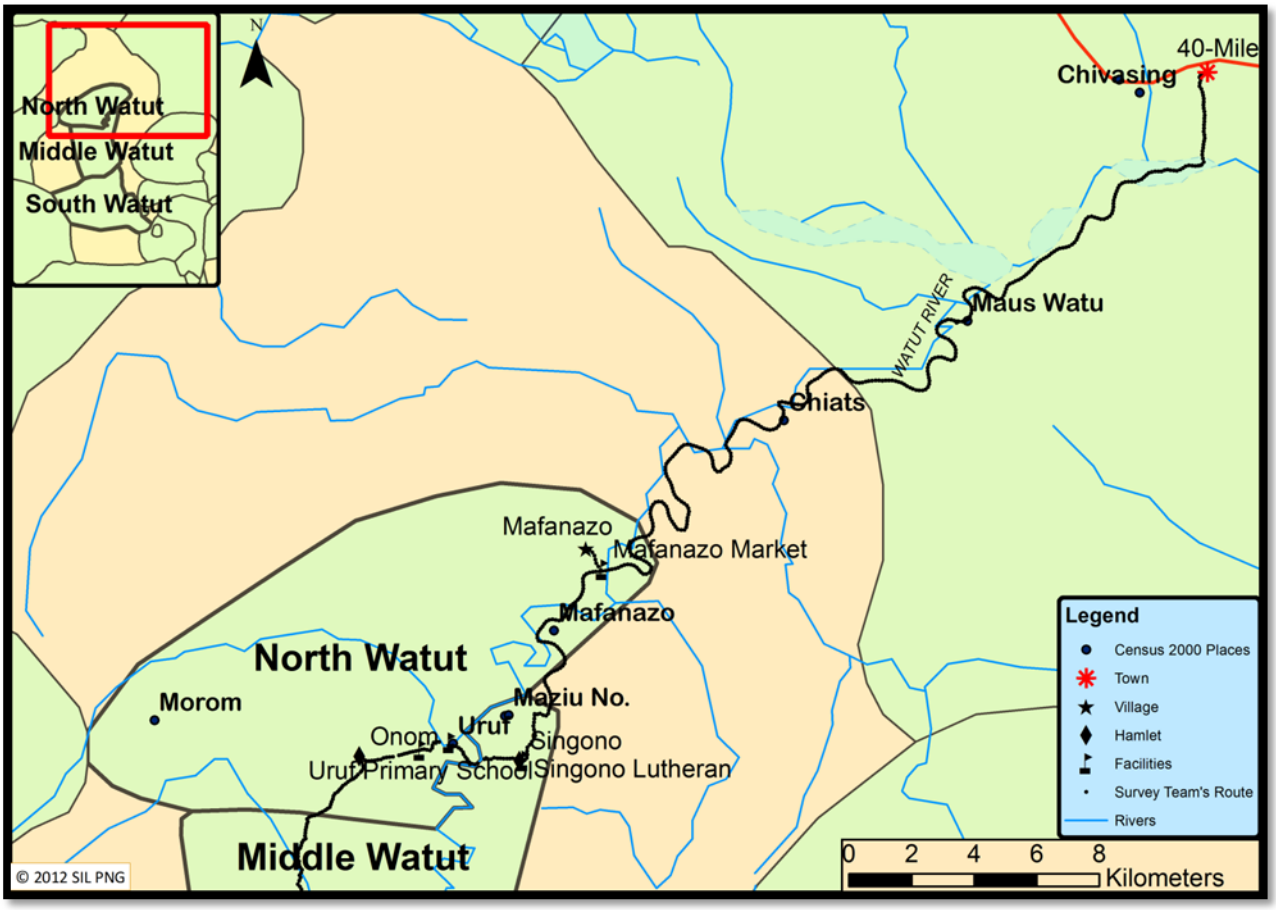
Map 4. Middle Watut



Note: Two dialects exist in Dungutung, one as linguistically similar to North Watut as to Middle Watut. It was reported, however, that the predominant dialect in Dungutung is the one more similar to other Middle Watut varieties, and that it is this dialect that all children are presently learning. Dungutung is therefore shown to be in Middle Watut.

The survey team travelled by canoe on the Watut and Markham Rivers from near Singono to Mafanazo, then on to a docking point near 40-Mile. Our track along this stretch as shown in map 5 is the current route of these rivers, with the exception of the short side trip into Mafanazo village and the final leg north into 40-Mile.

Map 5. North Watut



2.3 Population

Calculating accurate 2012 population data for this survey was problematic for a number of reasons. Our usual method is to use 2000 National Census data (National Statistical Office, 2002). However, our findings brought some of the census data into question.

First, it was clear that some of our census points did not correspond to villages that our informants recognised. Gumots, for example, was reported to be an area rather than a village, and the extent of the area represented by the name Gumots seemed to vary according to each informant.[7] Secondly, as described in section 4.4, we were unable to visit the villages of Maralangko and Zinimb.

Our usual method of calculating current figures from 2000 census data is to use the provincial growth rate to extrapolate population figures. The 2000 growth rate estimate for Morobe Province is one

[7]See appendix A for a complete list of locations.

of the highest in the country at 3.5%. Though this may be accurate for the province as a whole, our observations did not substantiate this. Many communities have grown very little, if at all.

Our Walkabout Questionnaire (see appendix D.5), though not aimed at measuring population, gave us data that enabled us to make more accurate population estimates for villages we visited. Our methodology for this was to first assume that population per household would remain fairly consistent between 2000 and 2012 even if the population figures themselves changed significantly. Having calculated an average population per household from 2000 data, we then applied this figure to the number of households we recorded on our Walkabout Questionnaire. These calculations can be seen in table 2.

Table 2. Watut population estimates

Lang. Area	**Census Points**	**2000 Pop.**	**2000 HH**	**2000 Ave. Per HH**	**2012 Pop. Est. Before Survey**	**2012 HH Visited**	**2012 Population Estimates from 2012 Survey**		
South Watut	Sanang	144	24	6	218	not visited	154[a]		732
	Dangal	244	52	4.69	340	42	197		
	Gumots	121	21	5.76	169	not found	129[a]		
	Wawas	135	27	5.00	188	29	145		
	Zinimb	51	13	3.92	71	not visited	55[a]		
	Maralangko	49	12	4.08	68	not visited	52[a]		
Middle Watut	Babuaf[c]	105	18	5.83	146	22	128		1705
	Marauna	568	118	4.81	791	46x3[b]	664		
	Bencheng	466	91	5.12	649	55x2[b]	563		
	Dungutung	397	84	4.73	553	37x2[b]	350		
North Watut	Morom[d]	55	24	2.29[e]	77	12[f]	27	139	634
	Onom[d]	?	?	4.87[g]	none	23	112		
	Uruf	172	35	4.91	240	41	201		
	Mafanazo	204	43	4.74	284	62	294		
						2012 Estimated TOTAL			3071

[a] As these communities were either not found or visited, these estimates were calculated by taking the present population of Wawas and discovering its population increase (1.07%) from its population in 2000. The rate for Dangal (a decrease) is believed to be unusual for other South Watut villages due to the departure of the men to work, therefore it is not figured in.

[b] Where a village was large, we sampled every second or third household. Totals are therefore multiplied accordingly.

[c] Babuaf in its entirety turned out to be four hamlets spread across several kilometres. We assume therefore that the figure in 2000 census data indicated as Babuaf is in fact the main hamlet of Madzim and that is where our Walkabout Questionnaire data is from.

[d] Census point Morom is located on a mountain ridge. Some 20–30 years ago, the community began to move down to the valley, settling at present-day Onom, which we visited. These two villages thus represent one community.

[e] This figure is markedly lower than the rest of the valley but as the motivation for movement from Morom to Onom was to allow children to attend school in Uruf, it makes sense that those households that remain in Morom would be smaller.

[f] We did not visit these 12 households but our informant gave us Walkabout Questionnaire data from which we derived this.

[g] As we do not have census data for Onom, this figure is the average for the Watut Valley communities.

2.4 Historical understandings of language classifications, boundaries and vitality

There are a number of works dealing with the Watut River area languages, some of which are not published. In 1989, Holzknecht published a study of the Watut area that far surpasses, in detail and validity, the work of previous scholars. Holzknecht's study includes an extensive literature review. The present discussion is therefore limited to key works that show a progressive understanding (to the outsider) of the Watut language communities. As stated in section 2.2, census spellings are used for village names throughout this document. This practice is maintained in this section, even though census names and spellings often differ from those used by authors of the works discussed. In direct quotations, census spellings are written in square brackets to indicate departure from the source. Otherwise, no indication is given that the names have been modified to match census spellings. The list of village names in table 17 in appendix A specifies the alternate names found in the literature.

1963: Fischer classifies the Watut varieties, naming them according to their relative geographic positions (north, middle and south), a system later adopted by Holzknecht (1989:18–20). Fischer's classification of Watut villages into these three varieties is shown in table 3.

Table 3. Fischer's linguistic classification

Language group	**Villages**
Südgruppe	Wawas, Gumots, Dangal, Maralangko, Zinimb
Mittelgruppe	Bencheng, Marauna, Babuaf
Nordgruppe	Dungutung, Uruf, Morom, Mafanazo, Unangg

In addition to classifying the Watut varieties, Fischer presents a lexicostatistical comparison between Watut and neighbouring languages Wampar [lbq] and Adzera [adz]. For the comparison, he uses unpublished, 100-item Wampar and Adzera wordlists obtained from Stürzenhofecker and Holzknecht (Fischer 1963:280). The Middle Watut list is his own, obtained from Bencheng (ibid., 207, 281). Fischer finds that Watut is 79% similar to Wampar and 60% similar to Adzera. He notes that 55% of the words on those three lists are exactly the same. Later, he decides to make a second comparison using 128-item wordlists (with words added for plants, animals, and cultural terms). In this comparison, Watut is 75% similar with Wampar and 62% similar with Adzera (ibid., 283).

1965: Hooley reports his findings from a survey of communities along the southern part of the Watut River. Concerning villages in the Watut area he says, "Although there are said to be about six dialects represented in these villages, they all claim to understand each other," and he concludes that literature developed in one variety might serve many of the communities (Hooley 1965:6). His initial impressions about language and dialect boundaries are further investigated in Landweer and Reitmaier's 1990 survey (Landweer and Reitmaier 1990), discussed below, so no further comment is given here.

1971: Hooley analyses Austronesian language data he and K. McElhanon collected throughout Morobe Province. This includes 100-item and 128-item wordlists taken in the Watut area in Dangal, Maralangko, Bencheng, Dungutung and Babuaf (1971:80–82). Hooley considers vernaculars with 77% similarity to be dialects of one language and vernaculars with 28% similarity members of a family (ibid., 91). Based on these criteria, he classifies the vernaculars spoken at Bencheng, Babuaf and Dungutung as dialects of one language which he calls 'Silisili', the name he also uses for Bencheng village (ibid., 95). He finds this language to be 60–70% cognate[8] with the Dangal and Maralangko languages (ibid., 86). Hooley groups Silisili, Dangal and Maralangko in what he calls the Lower Watut Subfamily (ibid., 96). Hooley also finds that Silisili is 62% cognate with Adzera and 75% cognate with Wampar.

[8]In this section the word *cognate* is used to refer to apparent cognates.

1988: Ross classifies the Silisili, Maralangko and Dangal languages as being members of the Lower Markham network in the Markham family, a subgroup of the Huon Gulf family (1988:132–133). For his classification, he relies on Hooley's data (Hooley, 1971). Ross examines intra-clausal morphosyntax to distinguish languages and dialects but arrives at the same classification as Hooley (ibid., 3).

1989: Holzknecht's Ph. D. thesis concludes that Hooley's classification is based on less than satisfactory data (1989:10). She similarly questions the validity of Fischer's methodology and concludes that his "data is neither detailed nor extensive enough to allow any real genetic or subgrouping hypotheses to be formed" (ibid., 9). Her own classification of Watut villages, based on more extensive language data, is shown in table 4. Holzknecht was unable to visit a village in either the South Watut or Middle Watut areas, so her language data for these communities were collected from speakers in or near Lae (ibid., 14). It was reported to her that South Watut speakers and many North Watut speakers are able to speak the Middle Watut variety, but Middle Watut speakers are not able to speak the North or South varieties. Instead, Tok Pisin is used for communication by Middle Watut speakers with speakers of other Watut varieties (ibid., 33–34).

Table 4. Watut villages according to Holzknecht (1989:33–34)

Language	Villages
South Watut	one variety is spoken in Dangal.[a] Wawas, Gumots, and Wanza settlement near Nadzab airport; a second variety is spoken in Maralangko and Zinimb
Middle Watut	Babuaf, Marauna, Bencheng, some in Dungutung
North Watut	Uruf, Mafanazo, Morom, Dungutung

[a] In addition, "A small group of so-called Kukukuku people, originally from Gumi village and speakers of the Angan Hamtai language, live in [Dangal] village" (Holzknecht 1989:31).

Holzknecht says, "In some instances, there is a definite indication that speech differences are being exaggerated, if not invented, to mark the in-group from the out-group" (ibid., 47). This suggests that there may be social as well as linguistic reasons for separate bodies of literature to be produced for various Watut communities.[9]

Holzknecht compares the Watut languages with neighbouring Markham languages and believes differences between them are significant enough to isolate the Watut languages as a distinct group:

> The Watut group of three languages is more conservative phonologically and morphosyntactically …than the other groups of languages, retaining features from Proto Markham which have been lost or changed in the other languages. Hence they constitute a group more through their morphosyntactic innovations than their phonological or lexical innovations (ibid., 183).

This finding suggests it may be difficult for the Watut communities to work with neighbouring language communities in language development. One of Holzknecht's particular objections to Fischer's work is that his cognate percentages between Adzera, Wampar and Watut are "very high" (ibid., 9). Although Holzknecht, having used the comparative method, does not present percentages which can be compared to Fischer's, she believes these three languages are less closely related than Fischer's figures would suggest (ibid., 207).

Differences between the Watut group and neighbouring languages are likely great enough to preclude their participation in joint language development. Holzknecht does actually show that both North Watut and Middle Watut share certain phonological features with Wampur [waz], (and that Middle Watut shares certain phonological features with Wampar [lbq]) (ibid., 188). There does not seem

[9] See Holzknecht (1989) for a discussion of phonological differences (pp. 54–55, 63–68) and morphosyntactic differences (pp. 94–163) between the Watut languages.

to be a linguistic case, however, for joint language development work to be done between the Watuts and neighbouring languages.

1990: Landweer and Reitmaier complete a sociolinguistic survey of Middle Watut. They say there are four Middle Watut villages: Babuaf, Marauna, Bencheng and Dungutung (1990:4). Regarding languages spoken in the region, they report the following: "[an informant] from [Bencheng] indicated that originally every clan spoke a different 'language' and traditionally lived in separate locations" (ibid., 2). Table 5 presents language information reported to the team by the informant.

Table 5. Languages reported by the informant during 1990 Middle Watut survey

Language	**Village(s)**	**Clan(s)**
Tsangkak	Gumots, Wawas, Maralangko	
Madzim	Babuaf	Warang, Efafago, 2/3 of Molago
Dzoents	Marauna	1/3 of Molago
Tsang	Bencheng	Molago, Laedzig, Baich, Bolal, Dofung
Bolal, Wagong	Dungutung	
Waroh	Uruf, Morom, Mafanazo	

Landweer and Reitmaier conclude that "This data from [the informant] substantiates the impression expressed by Hooley (1965:6) that the villages represent 'about six dialects'" (ibid., 3). Landweer and Reitmaier also say they classify the vernaculars of Babuaf, Marauna, Bencheng and Dungutung as "Mid Watut," following Fischer, and Holzknecht (ibid.). They say,

> From statements made by people in [Babuaf], [Marauna] and [Bencheng] we gather that historically each of the various clans was located in individual villages in the surrounding mountains. Then, beginning with the Lutheran missionization the clans either gathered themselves or were gathered in composite villages, down in the valley. This process was further encouraged (forced?) during World War II. It may be that the distinctive dialect situation referred to earlier is an artefact remaining from the time when the clans lived in separate mountain hamlets. (Landweer and Reitmaier 1990:4)

Our similar findings regarding the connection between languages and origins in the Watut Valley and implications for language development are discussed in section 7.1.

The 1990 team collected a Tsang[10] vernacular wordlist in Bencheng, a Bolal list in Dungutung, a Wagong list in Dungutung, and lists in Marauna and Babuaf. Their lexicostatistical analysis showed 85–96% apparent cognates between Tsang and the other lists. Tsang and Wagong respectively shared 57% and 80% apparent cognates with a North Watut wordlist from Holzknecht (ibid., 13). The team notes that "in spite of…precautions, the wordlists appear to be to some extent a mixture of all the varieties spoken in the area" (ibid., 12). Perhaps Fischer encountered a similar difficulty, resulting in the cognate counts which Holzknecht felt were high.

In regard to vitality of the Middle Watut vernaculars, the 1990 team concluded that there is "continuing use (though mixed) of the vernacular in the domains of home, cultural and social events, but primary use of other languages in the domains of church, education, and outside commercial enterprise" (ibid., 17). The team recommended that a vernacular language development program be started in the area.

[10] Note that some spellings of the dialects reported by the 1990 team differ from the spellings used in this report.

2.5 Clause structure, phonology and grammar of the Watut vernaculars

Detailed linguistic description and analysis of the Watut vernaculars has been carried out by previous researchers. As it was not possible for us to undertake comparable research on this survey, any impressions we could give about clause structure, phonology and grammar based on our data would be less authoritative than previous work. We therefore do not analyse our data in these areas but refer the reader to other published works.

According to Fischer (1963:224), the basic clause structure of the three Watut vernaculars is SVO. In this work, Fischer analyses more complex clause structures and discusses differences between the Watut varieties. Holzknecht (1989) examines clause structure in greater detail and also compares clause structures of the Watut vernaculars with those of neighbouring languages.

Holzknecht provides phoneme charts for the Watut vernaculars using a combination of IPA and other symbols (ibid., 53–55). Her data are presented here using all IPA symbols. Her symbol [r] represents both the trill and the lateral approximate [l], which she finds are used in free variation in all three Watut languages.[11] North Watut and Middle Watut have five vowels: [i] [u] [e] [o] and [a]. South Watut has four, lacking [o]. Consonants are presented in tables 6, 7, and 8. Holzknecht notes that "prenasalisation is phonemically significant in all the Markham languages," and lists prenasalised stops separately, as seen in tables 6, 7, and 8 (ibid., 2).

Table 6. Holzknecht's South Watut consonant phonemes (1989:54)

	Bilabial	Labiodental	Alveolar	Palatal	Velar	Glottal
Plosive	[p] [b] [^{m}b]		[t] [d] [^{n}d]		[k] [g] [^{ŋ}g]	[ʔ]
Nasal	[m]		[n]		[ŋ]	
Trill			[r]			
Flap						
Fricative		[f]	[s]			
Affricate			[t͡s] [d͡z] [^{n}d͡z]			
Glide	[w]			[j]		

[11]Our own finding through recording wordlists is that this free variation also includes [ɾ].

Table 7. Holzknecht's Middle Watut consonant phonemes (1989:54)

	Bilabial	Labiodental	Alveolar	Palatal	Velar	Glottal
Plosive	[p][ᵐp][b][ᵐb]		[t] [ⁿt] [d] [ⁿd]		[k] [ŋk] [g] [ᵑg]	
Nasal	[m]		[n]		[ŋ]	
Trill			[r]			
Flap						
Fricative		[f]	[s]			
Affricate			[t͡s][ⁿt͡s][d͡z][ⁿd͡z]			
Glide	[w]			[j]		

Table 8. Holzknecht's North Watut consonant phonemes (1989:55)

	Bilabial	Labiodental	Alveolar	Palatal	Velar	Glottal
Plosive	[p] [ᵐp][b]		[t] [ⁿt] [d]		[k] [ᵑk] [g]	[ʔ]
Nasal	[m]		[n]		[ŋ]	
Trill			[r]			
Flap						
Fricative			[s]			[h]
Affricate			[t͡s] [ⁿt͡s] [d͡z]			
Glide	[w]			[j]		

This is a rough sketch of the phonology. Holzknecht gives more detail in her work, such as a discussion of free variation noticed during her study.

3 Purpose and goals

The primary purpose of this survey is to recommend whether a vernacular language development program would be indicated for the Watut area. If a program is indicated, then the secondary purpose is to suggest which ethnolinguistic communities would be involved in the program and whether they might work together.

In regard to the primary purpose, two major factors guide our recommendation. First, vitality of one or more Watut vernaculars has to be high to indicate that the community would benefit long-term from vernacular scripture. Second, success of a program requires community support, so the community must be interested in developing their vernacular. These considerations lead us to the first two of our goals:

1. Determine whether the Watut vernaculars have high vitality.
2. Determine whether the Watut communities have interest in vernacular language development.

For Watut communities that are found to have strong vernacular vitality and interest in vernacular development, we recommend that a project be initiated. Our secondary purpose is to specify which ethnolinguistic groups could be involved, and whether or not they could work together. Because some village communities may share a common ethnolinguistic identity, our third goal is:

3. Determine how many ethnolinguistic groups could be involved in the program and assess their willingness to work together.

This enables us to specify whether one joint program could meet all the language development needs in the area, or whether groups need to work separately.

4 Methodology

Methodology will be discussed in terms of the three goals listed in the previous section. For each goal, research questions and corresponding indicators will be identified. We will mention the tools used to evaluate the indicators, followed by further discussion of tools in sections 4.4 and 4.5. Names of fieldworkers and a discussion of villages visited are also presented in section 4.4.

4.1 Goal 1: Determine whether the Watut vernaculars have strong vitality

Five research questions inform the first goal. They are listed below with corresponding indicators.

1 Do language use patterns suggest that language shift is occurring or likely to occur?

The presence of language shift in a community indicates that the community's vernacular is not likely to be used far into the future. Three indicators will show us that shift is not taking place, supporting a view that the vitality is strong:

- Children are fluent in the vernacular and use it in most domains.
- Parents use primarily the vernacular to socialise their children.
- The community uses the vernacular in most or all domains.

These indicators, if present, would show that vitality of the vernacular is strong. The indicators were assessed using probes on a questionnaire.

2 Do intra- and extra-community attitudes support continued use of the vernacular?

A community's language use is a reflection of its own and its influential neighbours' language attitudes (Landweer 2012:168–169). Positive attitudes towards use of the vernacular suggest continued use of the vernacular and strong vitality. A possible influence on language use choices is institutional support (Fasold 1984:221). For this reason we also consider language use in the church and in schools, the primary institutions at the local level in PNG. We identify the following indicators regarding the second research question:

- The community want their children to be fluent in the vernacular and to use it.
- From the perspective of teachers and pastors, the community likes to help outsiders learn and use their vernacular.
- Where they exist, churches use the vernacular.
- Where they exist, elementary schools use the vernacular.[12]

In communities where current vernacular vitality is strong, these indicators reveal forces that would promote continued use of the vernacular in the future. The first indicator was assessed using probes on a questionnaire. The second indicator was assessed using guided interviews with teachers and pastors. The third and fourth indicators were assessed using a combination of guided interviews with teachers and pastors, observation in churches and schools, and a participatory tool evaluating domains of language use in churches.

[12]See section 5.4.1 for a brief explanation of the Papua New Guinea educational system.

3 Does the language use of immigrants and returning migrants support continued use of the vernacular?

Immigrants and returning migrants may introduce outside languages to the community or facilitate language shift. Therefore, to help assess vernacular vitality we will look at the following indicators:

- Spouses of immigrants and returning migrants use the vernacular with their children; or immigrants and migrants constitute an insignificant percentage of the population.
- The community believe immigrants and returning migrants should use the vernacular.

These indicators not only suggest that immigrants and returning migrants pose no threat to vitality, but may indicate that other factors motivate immigrants and returning migrants to use the vernacular as opposed to other languages in their repertoire. This would suggest the vitality of the vernacular is strong (Landweer 2012:166–167). Assessment of these indicators was made using one probe on the Main Questionnaire and a house-by-house reporting tool called the Walkabout Questionnaire.

4 Does the community's distance from urban centres foster continued vitality?

This research question looks at opportunity for shift whereas others look at attitude (often evidenced by behaviour). It was assessed using the following indicator:

- Travel to Lae, Mumeng and Bulolo does not provide a majority of the community with great opportunity to shift their language (refer to map 1 in section 2.2).

Extremes in patterns of travel to Lae, Mumeng and Bulolo could be predictive in terms of vitality. If few community members travel to these places and they do so rarely, there is little opportunity for language shift. If most community members travel to these places and do so often, there is greater potential for language shift. Between these extremes, conclusions are harder to draw, but our description of the situation may still inform our overall assessment of vitality (Landweer 2012:164). This indicator was evaluated using probes on the Main Questionnaire.

5 Do economic endeavours weaken the vernacular?

If a community feel they need to use a language other than their vernacular to be economically successful, they may favour use of that language over the vernacular. This is especially true if they have ample employment opportunity in contexts where the vernacular is not used (Landweer 2012:169). These considerations lead to the following indicator:

- The need and opportunity to use a language other than the vernacular at work does not affect a large portion of the population.

Our description of the community's economic situation (in regard to language use) may inform our overall assessment of vitality. This indicator was evaluated using probes on the Main Questionnaire.

4.2 Goal 2: Determine whether the Watut communities have interest in vernacular language development

A community's interest in receiving the benefits of a project is hard to differentiate from the community's interest in committing resources to a project. During the survey, we made only general references to the kinds of responsibilities typically undertaken by communities in language development projects in Papua New Guinea. This is because no project has yet been proposed for the Watut area. Because of these difficulties, no separate probes were used for gauging interest. Instead, we expected relevant information to come to light through formal survey tools addressing other research questions as well as informal conversations recorded in team members' personal observation notebooks. We'll report our impressions from these findings to meet the second goal.

4.3 Goal 3: Determine how many ethnolinguistic groups could be involved in the program, and their willingness to work together

Addressing this goal, we have four research questions, each with its own indicator(s):

1 Which communities share a common origin?

Village communities which share an origin story have a shared identity and would likely work together in language development. Thus, the indicator for this research question is:

- Communities share an origin story.

Origin stories were related using a brief guided interview as part of the Main Questionnaire.

2 *Which communities have the same name for their language or report speaking the same langua*ge?

In reporting language names, communities have the opportunity to identify themselves in their own ethnolinguistic terms by differentiating or grouping themselves with the terminology of others. In addition, this indicator provides helpful terminology for comparison of speech varieties:

- Communities report sharing a language.

Communities that report sharing a language are likely to have a common identity at some level and therefore are likely to be willing to work together in language development. This was assessed using a participatory tool.

3 Which communities' vernaculars are closely related irrespective of the labels they use?

Communities who report speaking the same language likely feel they are affirming a shared identity. It is conceivable, therefore, that communities could share a language but label it with different names for the sake of maintaining separate identities. Therefore, it is important for us to ask separately about speech similarity, which is one purpose of the following indicator:

- Communities report having similar speech varieties.

This indicator encourages communities to report language relatedness separately from considerations of identity. It also gives communities the ability to differentiate dialects within their language (though not using the term 'dialect'). This was assessed using a participatory tool.

The second indicator examines speech similarity from an outside perspective:

- Cognate percentages derived from the lexicostatistical analysis of wordlists are high.

This indicator was assessed using wordlists elicited in each village. Because a previous researcher has cautioned against it, explanation for the inclusion of this indicator is necessary. Holzknecht (1989) strongly advises against using lexicostatistical analysis as a means of evaluating linguistic relatedness in the Watut River Valley and surrounding areas. She says,

> …there are some features of Markham societies, and indeed of many Papua New Guinean societies, which diminish the usefulness of lexicostatistics as a research tool. One of these features is word taboo, another is the heavy borrowing from neighbouring languages, whether Austronesian or Papuan, which occurs in all Markham language communities….Because of these reservations about the validity and usefulness of lexicostatistics in the Markham situation, I have chosen not to use it as a methodological tool in my study. (1989:12)

Although Holzknecht's reservations are appropriate in a diachronic study, nothing except 'word taboo' is a concern for our synchronic study.[13] Comparing wordlists gives us etic evidence, albeit cursory, to

[13]Because of the nature of the survey, we did not collect data that would enable us to say whether or not word taboo is still in practice, and if it is, whether it has resulted in the proliferation of synonyms between communities.

compare to information reported by community insiders about ethnolinguistic groupings. We also were able to visit a majority of the villages in each language area and wanted to record and compare a sample of linguistic data in the whole range of villages, something that previous researchers have not done. In section 7.3, our lexicostatistical findings are considered in conjunction with Holzknecht's findings.

4 Which communities engage in joint social activities?

Communities that already cooperate in some domains are likely to be willing to work together in language development. This is examined by the fifth indicator:

- Communities engage in joint social activities.

This indicator was examined using a participatory tool. The tool reveals which communities might cooperate, whether or not they share a common ethnolinguistic identity.

4.4 Tools and sampling

Tools used on the survey are attached in appendix D, except for the Wordlist, which is in appendix C. The first tool is the Main Questionnaire. This was completed once in each village with a large group from the community consisting of whoever responded to our open invitation to participate. We tried to wait to begin the tool in each community until we had a representative sample of ages and genders as well as one or more community leaders. One surveyor asked the questions and one recorded the answers. While mostly employing the question-answer format typical of a questionnaire, the Main Questionnaire also incorporates a brief guided interview (about origin stories) and three participatory tools. The first participatory tool has two parts, one for each of the following two research questions.

- *Which communities have the same name for their language or report speaking the same language?*
- *Which communities' vernaculars are closely related irrespective of what labels they use?*

This tool is complex and is printed as a separate document from the Main Questionnaire (see appendix D.2). It is considered the second survey tool. The other two participatory tools—assessing joint social activities and language use in churches—are less complicated and are considered part of the Main Questionnaire.

The second survey tool, Ethnolinguistic Groupings, provides a visual way for a community to represent who speaks their vernacular and how well the community understand other vernaculars in the survey area.

The third survey tool is a guided observation schedule used during the Main Questionnaire. While two surveyors asked questions and recorded answers for the Main Questionnaire, a third surveyor observed the participants and recorded observations using this schedule. The purpose was to record information such as whether the atmosphere was friendly or hostile, the topics of side discussions, or points of confusion regarding the Main Questionnaire. Notes about what languages were being used for discussion were also made.

The fourth survey tool, the Teacher and Pastor Interview, was used as opportunity allowed. It was administered by one or two surveyors.

The fifth tool is the Walkabout Questionnaire, used to record information during a guided tour of the village. It contains a place to record a sampling of village houses and the number of houses that belong to immigrants or returning migrants whose children do not speak the local vernacular.

The sixth tool is an observation schedule which was placed in each team member's personal observation notebook. Every surveyor followed this schedule while recording language use and other observations relevant to the goals of the survey over the course of each village stay.

The seventh tool is a Church Observation Schedule. This was used to record vernacular language use observed in churches.

The final tool is the standard SIL-PNG 170-item Wordlist (1999).We elicited this list once[14] in each village from an individual or small group recommended for being middle-aged and fluent in the local vernacular, and whose parents were from the village in question.

Fieldwork was completed by John Carter, John Grummitt, Janell Masters and Brian Paris in February 2012. Table 9 lists villages visited and work completed in each village.

Table 9. Villages visited and work completed

Dates[a]	Village or Hamlet	Tasks completed						
		Wordlist	Main Questionnaire[b]	Walkabout Questionnaire	Teacher Interview	Pastor Interview	Church Observation	Informal Interview
10–*11*	Dangal	X	X	X				
11–*12*	Sumaris (mining camp)							
12	Bukandu							X
12–13	Bubuparum	X						X
13–14	Wawas	X	X	X				
14–15	Madzim	X	X	X	X			
15–16	Marauna	X	X	X		X	X	
16–17	Bencheng	X	X	X	X			
17–*18*	Dungutung	X[c]	X	X	X		X	
18–*19*	Onom	X	X	X				
19–20	Uruf	X	X	X	X		X	
20–21	Singono	[d]	X	X[e]	X			
21–22	Mafanazo	X	X	X	X			

[a] Dates italicised in red are weekends. We stayed overnight in every location included here except Bukandu, where we spent only an hour.
[b] Completing this involved three tools: the Main Questionnaire, the Ethnolinguistic Groups tool, and the observation schedule for the Main Questionnaire.
[c] Two wordlists were taken in Dungutung, one for each of the dialects spoken there.
[d] The residents of Singono informed us that a wordlist taken there would be identical to that taken in Madzim.
[e] Completed virtually in Madzim, and then double-checked with Singono residents.

The visits to Dangal, Wawas, Babuaf, Marauna, Bencheng, Dungutung, Uruf and Mafanazo were made as planned. We had also planned to visit Gumots, Maralangko and Zinimb in the South Watut area, but this was not possible. In Dangal and Sumaris, we were given mixed reports about the location of Gumots. While all agreed that Gumots is the name of a geographic area, some said it is also an alternate name for the village of Bulaprik (a name we had not heard prior to the survey) and others said there is no village called Gumots. Understanding that Bulaprik might correspond to Gumots, we said we wanted to visit Bulaprik. Our guide in Dangal said that journey would be too difficult for us, but encouraged us to postpone our decision until we reached Sumaris mining camp, where he said we would be staying

[14] Twice in Dungutung, where two dialects were reported. See table 9 below for other exceptions.

overnight. We had not heard of Sumaris prior to the survey and did not want to waste time staying there, but were too exhausted by the time we reached it to go further that day.

At Sumaris, we were told it would take more than a day to reach Bulaprik, and there is no place to stay overnight. Our guide was not willing to attempt that route, and we were persuaded to travel directly to Wawas instead. It seemed from reports by locals that if we wanted to visit Maralangko and Zinimb, we should do so from Wawas and not on the way.[15] We set out for Wawas shortly after sunrise and passed through the hamlet of Bukandu mid-morning. The Gumots census point is located at Bukandu, but the women present when we passed through reported that it was a hamlet of Dangal. They also said that the residents—members of a single family—had been in this location for several generations.

We continued on, but still had not reached Wawas by nightfall. After hiking three hours in the dark, we reached the small hamlet of Bubuparum, which the residents said belonged to Gumots.

In Bubuparum, we again discussed the possibility of visiting Maralangko and Zinimb. According to local residents' descriptions, both villages were deep in the mountains and we could not manage the journey after our previous two days of strenuous hiking, particularly as two team members had injured feet. Instead, we accepted the offer of a motorised canoe ride to Wawas.

On the way from Wawas to Madzim, we passed a village along the river which the skipper identified as Maralangko. We were confused by this, understanding that Maralangko was away from the Watut in the mountains, and later discovered that this was indeed the case, and that what we saw was only a hamlet of Maralangko. If we had known of its existence prior to the beginning of our boat ride we would have done work there, but as it was, our arrangement with the skipper did not allow for this.

From Wawas, our course proceeded as planned until after Dungutung, when we had planned to visit Morom. We were told the journey to Morom involves a difficult trek up a mountain and that most of the Morom community had relocated to a new village in the valley, Onom. When we arrived at Onom, the residents confirmed that few people were living in Morom and assured us that there are no differences in speech or identity between the two communities. Thus, we did the work in Onom.

The last departure from our plans was that between Uruf and Mafanazo we visited Singono. We heard consistent reports that Singono was a hamlet of Babuaf along with Madzim and others. However, Singono's size, geographic distance from the rest of Babuaf, and proximity to North Watut villages made us wonder if the ethnolinguistic situation might be different in Singono than Madzim. Thus, we added this visit.

Although there are other census points near the area we surveyed, when we checked the names with villages we visited, locals either didn't recognise them, said they were mining camps, or said they use completely different languages. We are therefore confident that, apart from Gumots, Maralangko and Zinimb, we visited all of the main Watut villages.

4.5 Critique

Overall, the methodology seems to have allowed us to accomplish our goals. There is one area of data collection which we overlooked in regard to the goal of assessing vitality. While we considered the possibility that immigrants and returning migrants might introduce languages other than local vernaculars to the communities and thus provide opportunity for shift, we did not consider the possibility that emigration might significantly be reducing the size of the populations using the Watut vernaculars. As indicated in section 2.3, a discrepancy between population estimates using our data versus 2000 census data leads us to believe that the Watut communities may not be increasing in size as was expected. Our including some simple probes to gauge the amount of emigration from each village would have given us a fuller picture of the projected language vitality for the Watut communities.

[15]These locations did indeed turn out to be downstream from Wawas, though up other river valleys to the south and west.

We give brief evaluations of most of the survey tools in sections 4.5.1–4.5.5. The observation schedules[16] for the Main Questionnaire and for church services[17] are not discussed here as our only suggested changes related to formatting issues. The Wordlist is discussed at length in section 8.

4.5.1 Main questionnaire

One of the strengths of the Main Questionnaire is its concision. It took approximately an hour to complete, which meant that communities were willing to accommodate it into their schedules. This was especially important on this survey, as the advance notice we sent to the communities did not precede us, and the communities had not set time aside to meet with us. In one community members were especially busy as our visit coincided with the first of several days of lengthy community meetings. However, when told how long it would take, they were glad to accommodate us.

As evidence that the tool was logistically practical, many communities engaged us in lengthy question-and-answer sessions afterwards. We always invited people to ask questions, and some spent as long doing so as they had spent on the questionnaire itself. We were glad people were not so tired or pressed for time that they were reluctant to ask questions.

Another strength of the tool is its use of varied question styles. Some questions are broad enough to invite narrative-like answers, such as the opening question about origin stories. Other questions involve the completion of brief activities. Our impression is that this variation helped hold communities' interest. As evidence that people were interested, seven of the ten community groups ended the questionnaire with larger numbers of participants than at the start.

There are some specific changes we would make if we used the tool again. In some cases, the question in section 1 of the tool[18] about origin stories closed the group. This surprised us but, reflecting on community responses, we feel that reticence on the part of the community stemmed from asking for information which only certain members of the community can provide. When these individuals—usually elderly men—were not present, we encountered problems. We recommend altering the wording and placing it later in the questionnaire.

In section 2, we would position question 2.4 directly after 2.2. The current order makes interpretation of results for 2.4 difficult, as we discuss in detail in section 5.5.1. We also feel that question 2.4, being abstract, might invite interpretations and answers that differ from what we intend. We would consider describing concrete examples of speech events in which code switching occurs and ask for communities' feelings based on those examples.

In section 3 we felt that question 3.2.2 was worded awkwardly; we will modify this in the future. Question 3.2.6 would be more useful if followed up by asking for details about the conflicts mentioned if they involved communities in which we were interested.

Section 4 is a participatory tool about church language use. We believe it would be helpful next time to employ a key showing which colour chip stands for which language. Also, the part of the tool that concerns ideal future use of the vernacular seemed confusing to participants. Confusion centred around whether we were asking what the communities expect to happen or what they ideally want to happen. This does not affect our analysis where communities marked activities for future vernacular use. When they left them unmarked, however, we could not be sure whether they did so because they do not want to use the vernacular or because they do not think it plausible to use the vernacular.

Discussions in several communities suggest the latter is the case. For example, the Dangal community said they want their children to learn and use the local vernacular (implying church domains too), which contradicted the fact that they left activities unmarked. In Dungutung, the community was eager to say they would like to use the vernacular for Scripture, but there was disagreement over

[16]The observation schedule for the Main Questionnaire is included in appendix D.3.
[17]The Church Observation Schedule is found in appendix D.7.
[18] The Main Questionnaire is included in appendix D.1.

whether or not the vernacular would actually still be used in 2030. These and other instances suggest that communities tended to interpret the question to mean what they expect to happen, not what they ideally desire to happen.

Next time, we would consider eliminating this part of the tool and focusing on current vernacular use. We would elicit community attitudes by asking specific questions about the language use reported for each church domain.

In the final section, the first question sometimes elicited information about companies which had left the area long before. We would clarify next time that we are asking about companies currently present in the area.

4.5.2 Ethnolinguistic groups tool

This tool[19] seemed to readily engage the community and gave us exactly the kind of data we hoped for regarding linguistic and ethnolinguistic groupings. The one change we would make in the future is to bring more blank cards for village names and spend time at the start of the tool clarifying which villages are in the survey area. We had to eliminate data we obtained regarding one census point (Maziu No. 2) because many communities did not recognise the name. Some suggested an alternate name for the village, but we were never sure that this was indeed the same village. Spending time clarifying villages and names at the start of the tool in each community would ensure that we obtain consistent, useful data.

4.5.3 Teacher and pastor interviews

There is nothing we would change about this tool,[20] but our manner of administering it sometimes resulted in less data being gathered than was ideal. Some of the team found that they would have benefitted from training and practice in conducting guided interviews ahead of time. This kind of professional development would help a team to maximally benefit from the tool.

We also would make a point in the future to have two surveyors administer the tool: one to ask questions and one to record answers. This would allow a more natural flow of conversation. In addition, the quality of the data would be improved if the surveyors reviewed their notes immediately following the interview to flesh out anything that was abbreviated or left out during initial data recording.

4.5.4 Walkabout questionnaire

This tool[21] was more engaging for the surveyors and participants than it would have been if administered in a sit-down, question-and-answer format. The surveyors appreciated the chance to see the village and spend one-on-one time with a knowledgeable local participant.

The tool provides valuable information about immigrant children's language use that can be compared with reports given by the community group completing the Main Questionnaire. Whenever possible, the surveyor should ask parents themselves about their children's language use while administering the tool. This level of detail and accuracy is helpful and less tiring for community informants if spread out in this way.

There are two changes we would make to the tool in the future. The first change is that we would always ask where immigrants or returned migrants are from. The current format of the tool requires this information only if the children reportedly do not speak the local vernacular. In retrospect, we would

[19]This tool is included in appendix D.3.
[20]The interviews are found in appendix D.4.
[21]The Walkabout Questionnaire is included in appendix D.5.

have liked complete information to see whether immigrants and returned migrants were coming from the same language area or from different language areas to the local vernacular.

The second change is to clarify, when we ask whether children speak the local vernacular, what level of fluency is being reported. This could be anything from full fluency to knowing only a few key words in the vernacular, and it would be useful to us to know this level of detail.

A noteworthy observation about this tool is that it is sometimes not logistically feasible for the surveyor to visit all hamlets of a village. The community of Babuaf, for example, is comprised of several hamlets that are geographically too distant from the main village for the surveyor to walk to them while completing the tool. In this type of circumstance, the surveyor asked his or her informant to give a 'virtual' tour of the hamlet, describing how many houses are in it and which ones have immigrants or returned migrants. This request for a virtual tour proved to be no challenge for our informants. In fact, we were given a virtual tour of a Babuaf hamlet, Singono, which we later visited. The virtual report was checked in Singono and was found to be nearly perfect, giving us confidence that this method is a reliable alternative in situations where it is not possible to visit every hamlet.

4.5.5 Observation schedule for notebooks

Overall, the team found this to be a helpful tool[22] for guiding observations of language use during village stays. In the future, we would add a section specifically asking for observations of code switching. Also, we believe it would be valuable to create a collection of observation schedules for specific speech events we might encounter on a survey, such as a children's sporting event. We could utilise the schedules to record detailed observations of particular events, requesting informants to help us know which languages are being used and what is being said.

4.5.6 Language use observations

While designing tools for this survey the team became aware that we would be able to complete all of them quickly in each village where residents were able to gather upon our arrival. We debated the possibility of doing our work in more than one village in a day if circumstances made this possible. In the end we decided that being able to make language use observations would provide an important check on reported data, and made plans to stay a night in each village.

Though we kept to this plan, several hindrances rendered our observations less effective. On a few occasions, events (community meetings), weather (rain), or timing (everyone being in the garden) afforded little opportunity for taking notes. In other villages we were hindered from making general observations because we ended up spending most of our time with only the family in whose house we were staying. On at least one occasion one of the adults in the house was an immigrant. Houses with an immigrant were a minority in all villages visited, so observations in houses with immigrants were not representative of the entire population.

While an obvious solution to our troubles would be to make more observations of a higher standard, this is easier said than done. Though some situations can be manufactured to allow observations—for example, we took a frisbee on this survey and were able to observe the children playing—these are artificial to some extent. Getting quality observations is, therefore, to some degree a matter of chance.

It would have been helpful if, prior to our departure from each village, we confirmed that we had sufficient observations to serve as a check on the reported data from our Main Questionnaire. If observations were inadequate at that point, we could conceivably have remained until observations could be made.

[22]The observation schedule is included in appendix D.6.

5 Goal 1: Language vitality

Evaluation of the vitality of the Watut vernaculars, our first goal, is based on our findings regarding current language use and influences favouring or opposing sustained vitality. The purpose underlying this goal is for us to recommend whether or not a vernacular language development program is indicated for the Watut area. Where language use and underlying influences clearly favour strong and sustained vitality, or where they clearly favour low and decreasing vitality, drawing conclusions regarding a program is straightforward. As described in the following sections, the Watut area does not present such a clear case. Each community uses a mix of Tok Pisin and the local vernacular, and influences make predictions of future vitality difficult. Though we feel that, overall, factors favour the view that vitality is strong enough and likely enough to be sustained that the Watut area would benefit from a language development program, we describe the factors which play into both sides of the argument.

5.1 Findings regarding language use

Reported data are useful in showing the perceptions, intentions, and attitudes of respondents, but information collected in this way becomes even more valuable when compared to observed data. Observations try to get at what is actually happening, and comparing this to the perceived reality further clarifies the values of respondents.

Section 2 of our Main Questionnaire collects language use perceptions. The answers to these questions were compared with the team's language use observations to arrive at the conclusions described below. Our aims are to determine whether the local vernaculars are vital and, if so, whether they are likely to remain vital in the future.

Three indicators were proposed which would demonstrate that language shift is not occurring or is unlikely to occur:

1. Children are fluent in the vernacular and use it in most domains.
2. Parents use primarily the vernacular to socialise their children.
3. The community use the vernacular in most or all domains.

In each of the communities the survey team visited, children know the vernacular but use it alongside Tok Pisin. Parents use the vernacular but not always with their children. Finally, the communities do use the vernacular in many domains but sometimes not 'most or all'. Since the indicators are not met to the fullest degree, we cannot conclude that shift is not occurring or is unlikely to occur. Indeed, based upon our research, shift to Tok Pisin is already occurring in some villages. In others, it may be possible that current levels of vernacular use could continue unchanged into the future, spoken alongside Tok Pisin. This will be examined in detail below, with conclusions drawn for each Watut language.

5.1.1 South Watut

South Watut presents a mixed picture, one which corresponds to its geography, but the vernacular remains vital in most villages. The team were able to visit only two of the six South Watut villages but believe some helpful comments can be made regarding the villages not visited.

In Dangal, Tok Pisin is dominant. Though everyone seems to know the vernacular, its vitality and the fluency with which it is spoken is being affected and will continue to decline in the future. In Wawas, by contrast, the vernacular is valued as the primary means of communication in the village. Based on factors explained below, we believe the vernaculars of the other South Watut villages are as strong as or stronger than that of Wawas.

Gold, proximity to town, and Dangal's dispersion are bringing the vitality of its vernacular into question. Residents are aware of this. They report heavy Tok Pisin use; one person said, "Tok Pisin is taking over everything."[23] Dangal is the only village to report that in some domains only Tok Pisin is used. Children, they say, use only Tok Pisin for the areas queried during the Main Questionnaire unless they are not understood by grandparents, in which case they use the vernacular. Adults claim to use the vernacular to scold the children, but report using both Tok Pisin and the vernacular in most situations themselves. Dangal and Marauna (in Middle Watut) were the only two villages to report that children learn Tok Pisin before the vernacular.

Though the team observed children speaking the vernacular and responding to commands in the vernacular by adults, Tok Pisin was frequently used.

In Wawas, a more cohesive village farther from town, the vernacular remains strong. Residents there consciously valued their vernacular, and said it's "our culture"[24] and "the language of our ancestors".[25] They reported that adults use only the vernacular for the domains queried, but said that children use both the vernacular and Tok Pisin for most functions.

The team heard more Tok Pisin in Wawas than we anticipated from these reports, but all segments of the population were heard using the vernacular fluently.

Extrapolating from these trends we suggest that in the South Watut villages of Gumots, Maralangko, and Zinimb the vernacular is as strong as or stronger than in Wawas. They are farther from town than Wawas—in fact, Wawas is likely their gateway to town—and are away from the river and its gold.[26] Sanang may fall into the same category as these other South Watut languages, being a day's difficult travel from Dangal. Lending strength to this extrapolation was the report in Dangal that 'some children in the bush'—mentioning Sanang and Gumots specifically—learn the vernacular first, contrasting their level of vernacular proficiency to that of Dangal.

Because the team were able to visit so few of the South Watut villages we do not have wordlists from each to compare to arrive at lexicostatistical similarity figures. Our only observation which would suggest that the variety in each village is understood by others was a conversation between a Dangal resident and a resident of Bubuparum (reported to be a hamlet of Bulaprik).[27] These two men spoke for long periods of time in the vernacular and were apparently able, at least, to understand one another's speech.[28]

In summary, the vernacular of South Watut remains vital in most locations. Dangal is the exception. There it is declining in use, and proficiency must inevitably suffer in future generations. Residents are aware of the causes but do not seem to be making a determined effort to fight shift. In Wawas the vernacular remains strong and important to their identity. The other villages of South Watut will likely continue to use the vernacular for most functions; their vernaculars are vital, unless some unobserved influence is at work upon them.

5.1.2 Middle Watut

In each Middle Watut village, with the possible exception of Marauna, the vernacular remains vital, but it is often used alongside Tok Pisin. Whether this represents a stable bilingualism or language shift is unknown, but for now it seems to be the former.

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[23] *Tok Pisin karamapim.* Tok Pisin quotations are translated to English in the main body of the report and the original quote is given as a footnote.

[24] *Kalsa bilong mipela*

[25] *Tok bilong tumbuna*

[26] Maralangko, at least, has a hamlet on the Watut where panning gold is a priority; if a large population has or will shift to this hamlet (as has happened in Marauna), vitality may be affected.

[27] Gumots. See appendix A.

[28] Note, however, that one report claimed that Maralangko and Zinimb had another dialect from the other South Watut villages.This concurs with Holzknecht's findings as reported in section 2.4.

In our first location, the Madzim hamlet of Babuaf, more vernacular use was reported than in any other village surveyed. Vernacular alone was reported to be used in every situation queried for adults and children except for children talking to their friends, where vernacular and Tok Pisin are both reported. Despite this, Tok Pisin is not perceived negatively, but was said to be helpful for talking to people from other places.

From that extreme we went to Marauna, just across the river, where Tok Pisin and vernacular are reported to be in use side by side for every domain except traditional singsing, and where we were told that children learn Tok Pisin before the vernacular. It is difficult to determine the cause of such drastically different reported language use patterns. While in Madzim they expressed an affinity for their vernacular—"it's our language"[29]—the Marauna community leader who was the main respondent said that English and Tok Pisin are likely to take over all of Papua New Guinea. One would be tempted to suggest that he overstated the case for his community as he did for the country, except that another woman present agreed with him, and the team did observe far more Tok Pisin than vernacular in Marauna, especially among children.

The other communities of Middle Watut—Bencheng, Dungutung, and Singono (another hamlet of Babuaf)—fell between the communities of Madzim and Marauna in terms of language use patterns.

Singono reported similar trends to Madzim but leans somewhat more toward English and Tok Pisin, probably because of Babuaf Christian School, a private English elementary school in another hamlet near their own. Children of Bencheng and Dungutung both go to primary school in Bencheng. Of the 14 domains about which we asked, the vernacular is reported to be the only language used for ten in Bencheng, eight in Dungutung and six in Singono. The other domains in these three communities are a mix of Tok Pisin and the vernacular.

It should be noted that there are two dialects in Dungutung. Speakers of both dialects agree that Boral is predominant and is being learned even by children of speakers of the other dialect, Wagongg.

We were unable to make as many language use observations as we would have liked in every location. Observations that were made, however, generally tended to confirm reports in Middle Watut.

In Middle Watut, then, the vernacular is often used alongside Tok Pisin. The team found no evidence that argued overwhelmingly that language shift was happening. If shift is happening, it is at a very slow pace. It would seem, rather, that the vernacular remains vital (children are continuing to learn and use it), but that people are bilingual with Tok Pisin and choose to use the latter on many occasions, even if there is not an obvious need to do so. As mentioned above, Marauna is the exception. There much Tok Pisin was reported and observed, and it is possible that children may not achieve the same level of vernacular fluency as their parents have.

5.1.3 North Watut

The three villages of North Watut are influenced by immigration to a much greater degree than South Watut or Middle Watut.[30] Despite the report that nearly all of the children of immigrant parents learn the vernacular, immigration clearly impacts language use. Residents in Uruf explain that children only mix the vernacular with Tok Pisin if they have immigrant parents. Given that the percentage of immigrants is higher in Uruf than in any other village surveyed, language use is certainly affected by immigration there and in other communities with similar influences.

Uruf was unusual in a number of ways. First, they reported that the adults use only vernacular for the areas queried (only Wawas and Madzim reported the same) and that they "feel bad"[31] when they hear their children mixing languages, though we observed some adults using Tok Pisin. Second, despite this report, adults went on to say that children use the vernacular to speak to parents and siblings but a

[29]*Em tok ples blo' mipela.*
[30]See table 10 in section 5.3.1.
[31]*Pilim nogut*

mix of the vernacular and Tok Pisin to speak to grandparents. Elsewhere in the Watut Valley if children are reported to use Tok Pisin it is generally to their friends and perhaps to adults, but rarely to their grandparents. Children usually use the vernacular to speak to their grandparents.

An elderly man in Uruf told us that only he and a few other elderly people know the 'true vernacular', a statement which could account for children's language choices when speaking to their grandparents. He said that the vernacular of the younger generations is different. He called this true vernacular 'Mpubunum', the same name given in Onom, though Uruf residents had earlier given their language name as 'Wagung', similar to the name of one of the dialects of Dungutung (Wagongg).

Whether shift has occurred due to the influence of immigrants from Dungutung (almost a third of the immigrants in Uruf were from Dungutung) or some other cause is unknown, and further research is needed to discover the cause of this shift.

Observations in Uruf and Mafanazo were not sufficient to confirm or refute reported data, but in Onom the team noted that, despite the community's desire for English and Tok Pisin, a lot of vernacular was being used.

The team has no firm evidence, partly due to insufficient observation, to doubt the vitality of North Watut. However, language shift can occur in multiple forms. In communities like Uruf, with a high percentage of immigrants from another village in the same language area, shift within the vernacular (that is, the vernacular itself changing), is possible.[32]Another possibility is a shift away from the vernacular toward another language, in this case Tok Pisin.

As in Middle Watut, a stable bilingualism could exist now or in the future between the vernacular and Tok Pisin for these communities. However, given their interest in education, the number of immigrants, and the proximity to town, it is likely that gradual shift to Tok Pisin is occurring in North Watut.

5.1.4 Summary of Emic reports and observations

In most of the Watut River Valley the vernaculars remain vital. In Dangal and Marauna Tok Pisin is already used heavily, and the vernacular fluency of future generations is likely to decrease unless something changes. In other villages the desire for education—perhaps especially English—draws attention away from the vernacular, and these communities must exercise caution if their children are to avoid loss of vernacular fluency. These communities include Singono and Mafanazo, though Onom and Dungutung are also at an earlier stage of the same process.

Other communities—e.g., Madzim, Wawas and Bencheng—value their vernacular and see its importance to their culture. These communities have the motivation to maintain the vernacular for some time to come.

Immigration seems to be having surprisingly little effect on vitality. The potential for change is certainly there, however, and in communities with a higher percentage of immigrant parents (notably North Watut villages) continued intentional effort will be necessary to prevent shift toward Tok Pisin.

In each language group—South Watut, Middle Watut and North Watut—at least two villages demonstrate good-to-moderate vitality. The differences in language use that exist between villages suggest that most villages are fairly independent, and the influences acting upon each are to some degree unique to that village.

South Watut is the most isolated and so has fewer outside contacts. Except for Dangal, its vernacular is likely to continue to be used by future generations.

In Middle Watut, Tok Pisin and the vernacular are frequently used side by side, but in most locations (except Marauna) this may be a stable bilingualism. Those villages which consciously value

[32] Information on immigrant origins was collected in Uruf, counter to usual practice. See critique in section 4.5.4. We cannot determine whether the other communities are influenced by this type of immigration.

their vernacular exhibit higher levels of usage, and their vernaculars are likely to endure longer than in villages where education or commerce are the main focus.

North Watut villages are influenced by immigrants and by the desire for education. In Uruf and Mafanazo there seems to be a slow shift toward Tok Pisin. The same factors are at work in Onom, but residents continue to use much vernacular.

5.2 Community language use as reported by teachers and church leaders

As part of our vernacular vitality assessment, we want to compare insiders' perspectives on community language use with outsiders' perspectives. We identified teachers and pastors as key outsiders we could interview during the survey. We interviewed 13 teachers in six communities, though it turned out that eight of the teachers are originally from the local area. We interviewed only one pastor. The data from these interviews cannot be considered a purely outsider perspective. The interviews do, however, give a second opinion about the sociolinguistic situation in the respective communities. In general, the interviews confirm community reports throughout the survey area that a mix of Tok Pisin and vernacular is used by children. Data from interviews suggest that both Tok Pisin and the vernacular play important roles in children's linguistic repertoires in the survey area.

The outside teacher in Mafanazo reports that children in the community speak both the vernacular and Tok Pisin by the time they begin elementary school. The local teacher in Dungutung says his children are fluent in the vernacular and are more comfortable speaking it than they are Tok Pisin. He says children in the community know how to speak the vernacular by the time they enter the elementary school, and they learn to read and write the vernacular in school. A local Madzim teacher says the same about Madzim.

In Bencheng, we interviewed four primary school teachers. The local teacher reported that children generally speak the vernacular by the time they start elementary school, though they are still expanding their knowledge of the language since they are only about six years old. He said most children use the vernacular while playing at school and as a secret means of communicating when outside teachers are around. The outside teachers concurred with these statements.

At no time did any of the teachers suggest that Tok Pisin is the primary language used by local children or that Tok Pisin satisfies their communication needs. The local primary school teacher in Bencheng said that certain Tok Pisin words have replaced their vernacular equivalents. "If I say one of these words in the vernacular," he explained, "the children do not understand." On the other hand, when he is teaching a difficult concept or the children are confused, he provides an explanation in the vernacular because otherwise the children have trouble grasping it. Information presented to the children in Tok Pisin is thus harder for them to absorb.

The pastor interviewed in Marauna had lived there for two years. His children were slowly learning the vernacular and liked to use a mix of Tok Pisin and the vernacular with friends in the village. The Marauna community had translated songs he taught them from Tok Pisin to the vernacular.

The perceptions related to us during teacher and pastor interviews suggest that the Watut vernaculars currently have strong vitality. It is difficult to extrapolate an estimated future vitality from the data. It does not seem probable that Tok Pisin will soon replace the local vernaculars. Nor does it seem likely that Tok Pisin will be relegated to limited domains in Watut communities. Instead, it seems that a mixture of Tok Pisin and vernacular will be the clearest means of communication among members of the Watut communities in the future.

5.2.1 Summary of reported and observed language use

Reports of community insiders and outsiders and our own observations conclusively show that a mix of Tok Pisin and vernacular language is used by every Watut language community. Reports of teachers and pastors tend to emphasize the importance of the vernacular for communication more than large group community reports.

In South Watut, half of our data come from Dangal, which has lower use of the vernacular than the other communities surveyed. We believe the vitality of the vernacular is strong in the other South Watut

communities, based on our data from Wawas. In Middle Watut, with the exception of Marauna, the vernacular is used to such an extent that we conclude it has strong vitality. In North Watut, we also conclude that the vitality is strong, based on current use. But we also note that Tok Pisin is used by all communities at times when we might expect the vernacular to be used. Based on language use data, we feel that the Watut communities would need to make a deliberate effort to continue using their vernaculars in most or all domains for the current levels of vitality to be sustained.

5.3 Opportunity for contact with other languages

One of the influences which might favour or oppose sustained vernacular vitality is the amount of exposure the Watut language communities have to other languages. As will be detailed in the following sections, Tok Pisin is the other language of greatest relevance to the Watut communities. Although their level of exposure to Tok Pisin is not so great that they have little choice but to shift to Tok Pisin, they do have ample opportunity to hear and use Tok Pisin.

5.3.1 Migration

Data on migration were collected on this survey using the Walkabout Questionnaire (see appendix D.5), focussing particularly on the impact on the vernacular from two groups of people: returning migrants and immigrants from other language areas. Although the tool specifically asked informants about returning migrants, none were found in any of the nine communities where the tool was administered. Thus, there seems to be no significant impact on the vernacular from residents migrating to other language areas and returning to the villages of the Watut Valley.

Data collected did indicate, however, that there are high numbers of immigrants in several of the communities where the tool was used, as shown in table 10.

Table 10. Data on immigrants to Watut Valley communities

Lang. Area	Census Points	2012 Est. Popn.[a]	Immigrants[b]	Immigrants with children not using vernacular	No. of immigrants in lang. area
South Watut	Dangal	197	2 (1%)	0	6 (2%)
	Wawas	145	4 (3%)	3 (2%)	
Middle Watut	Babuaf[c]	128	8 (6%)	0	69 (4%)
	Marauna	664	19 (3%)	2 (0.3%)	
	Bencheng	563	27 (5%)	0	
	Dungutung	350	15 (4%)	9 (3%)	
North Watut	Morom/Onom[d]	139	19 (14%)	0	95 (15%)
	Uruf	201	36 (18%)	0	
	Mafanazo	294	40 (14%)	0	
				TOTAL	170 (6%)

Note 1: These figures are taken from our population table in section 2.3.

Note 2: Some of these reported immigrants may come from the same language group; see section 4.5.4.

Note 3: Figures for Babuaf are based on data collected in Madzim hamlet which corresponds in size to census data and GPS point.

Note 4: This data represents the two settlements as one community.

Although the data show that nearly a fifth of the population may have migrated into certain communities (e.g., Uruf), it is notable that no more than 3% of immigrants in any community reported their children not using the vernacular. Therefore, while migration does provide the Watut communities

with opportunity to contact other languages—those using North Watut in particular—present indications show that the traditional vernaculars in the Watut communities are resilient.

When immigrants speaking a variety of languages marry into an area, there is less opportunity for them to have a marked impact on language use than there would be if the immigrants originated from one language, forming a sizeable enough unified minority to influence shift away from the local vernacular. Our ability to assess this dynamic is limited by the lack of data for immigrant origins (see section 4.5.4). In Uruf, where this information was collected, immigrants came from eight language areas (less impact likely) but nearly a quarter came from Dungutung (more impact likely, but this is still only eight individuals).

With immigrant numbers low in most communities and without a large immigrant population from one particular area, the impact of immigration on language use is fairly low. So while a threat to vitality is unlikely to come from an outside vernacular, to what extent is Tok Pisin a threat? There were consistent reports from almost every community that they teach immigrants their vernacular and that, at least in time, they learn it. The only exception to this was Mafanazo and even there, despite saying that use of Tok Pisin was acceptable, they reported that the immigrants still sometimes learn the vernacular.

It was rare to find immigrants whose children did not use the vernacular.[33] Of all the immigrants to Uruf, for example, none reported that their children did not use the vernacular. One significant factor which may contribute to this stands out clearly from the Walkabout Questionnaire data. Of the 142 households sampled that contained immigrants, only 13 on the entire survey contained more than one adult immigrant. Most immigrants have married into the community in which they live rather than having married prior to immigrating. As a result, their children are exposed to at least two languages at home, and in the vast majority of reported cases this results in them acquiring the local vernacular. Whereas children in only 4% of households with one immigrant adult did not learn the local vernacular, this figure rises to 38% when two adults are immigrants.

In summary, it seems that although there are large immigrant populations in the North Watut communities, there is strong evidence that this has not resulted in a weakening of the vitality of the vernacular. Immigrant numbers in other villages are low and are unlikely to threaten the vernacular.

5.3.2 Economics and travel patterns

Language communities that do not need to use a second language to meet their perceived economic needs typically have higher vernacular language vitality than those that are dependent on an economic base outside the language area. The Watut communities choose to be involved in economic endeavours which require them to use Tok Pisin. Therefore, their vernacular vitality is likely lower.

Residents of the Watut Valley, though not strictly dependent on outside jobs, do require the ability to sell their chief resource—gold—and do so primarily outside their area. Apart from the need to trade excess garden produce and procure basic goods and foodstuffs, gold is the biggest motivator for travel both within and outside of the valley. Travel is frequent, and in a number of villages the sentiment, “Lae is our hometown”,[34] was expressed. Lae, Bulolo and Mumeng were the three primary destinations, but the importance of 40-Mile as a transit point for all travel, apart from that originating in Dangal or Sanang, should also be noted.

The survey team observed that residents of Dangal, Wawas, Maralangko, Madzim and Marauna were either panning for gold from riverside deposit or had the tools to do so. The village of Bencheng has a hamlet on the river, but we do not know whether panning is done there. We were told that gold could be procured further downstream, but as the river slows in the Middle Watut area the gold carried by the river decreases.

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[33]Our tool did not differentiate levels of fluency; see section 4.5.4.

[34]*Lae em i asples bilong mipela.*

The possibility of panning more than K50[35]of gold a day per person in some areas makes travel to town attractive. Residents sell it in towns such as Bulolo, where they purchase necessities or spend it on recreation. In Wawas, several men showed the survey team small spheres of gold dust hardened by a chemical process; one man had three of them, probably worth more than K500[36] combined! There was apparently no urgent need to cash these in, as boats had gone to town just the previous day.

Gold has also influenced movement within the valley. Maralangko and Marauna have established hamlets on the river to have easier access to the gold. On an island in the middle of the Watut River between Madzim and Marauna, there is even a camp complete with rudimentary shelter and cooking equipment where residents of Marauna pursue gold industriously.

In some villages, company employment has also prompted movement. Dangal was the most notable, with 40 residents hired on a temporary basis by Sumaris Mining Camp. This report was clarified by employees at Sumaris, who said that the camp hires 40 men at a time. Though a significant number of these may come from Dangal, not all do. At Harmony Gold Mine[37] "plenty"[38]of workers are said to come from Wawas, one from Dangal, two from Singono, and three or four from Marauna. Morobe Mining Joint Venture (MMJV) is said to employ five from Wawas, five from Madzim and a few from Singono.

Apart from gold, two other economic influences exert a lesser influence. First, cocoa cooperatives are increasing, primarily in the Middle Watut area and with the support of MMJV, and soon people will be sending much produce down the river for sale. It was reported that copra used to be produced and sold, but now cocoa and coffee are the only cash crops. The team saw no evidence of coffee but did observe extensive peanut gardens; reports may reflect general practices in previous decades.

Second, a market exists in Mafanazo, the only market in the area. Even as far south as Wawas people said, "Mafanazo is our market,"[39] but we assume that they only stop there when traveling to or returning from town, due to the distance. Market happens at least three days a week, probably taking advantage of the general trends of travel to and from town. People buy food from stores and markets in Lae but rely primarily on their own subsistence farming for food.

Economic activity can have a strong impact on language use. In the Watut Valley, the influence of companies is fairly minimal at present, with the exception of Dangal, where they said that many men had gone to work and only a few remained to look after the women and children. Dangal residents have also dispersed from the village centre, wanting to stay on their land in order to have a stronger claim for compensation in the event of a company coming to their land.

This latter would not, of course, have an effect on language use currently, but being employed by a company does. Though Dangal residents claimed that they were teaching their vernacular to other people at Sumaris, Tok Pisin and even some English are the primary languages used there. Apart from Sumaris, all communities reported that men use Tok Pisin when working for companies. The percentage of the population working for these companies is low (again, except Dangal), so we would not expect this to have a profound effect upon the language use of the area.

The frequency of travel to town, by contrast, may well have a strong effect on language use. Nearly everyone goes to town as often as they wish. Going to town seems to be a very attractive prospect to everyone, and it would not be surprising to find people using more Tok Pisin because it is the perceived language of economic prosperity. Travel to town has also created a number of jobs operating the motorised canoes used for public transport. From Wawas down, many of the villages have several canoes which make the trip down to 40-Mile regularly.

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[35]At the time of the survey, that amount converted to 22.66 Australian dollars or 24.34 US dollars.
[36]At the time of the survey, that amount converted to 226.55 Australian dollars or 243.40 US dollars.
[37] Note that a number of these companies are either partners or subsidiaries of others listed here.
[38]Translated from the Tok Pisin *planti*, which is an ambiguous number. This could be as few as five people.
[39]*Mafanazo em i maket bilong mipela.*

5.3.3 Conclusions on opportunity for contact

Migration and economic endeavours provide the Watut language communities with ample opportunity and motivation to use Tok Pisin. Migration is almost wholly due to marriage, and Tok Pisin is a convenient means of communication in families with an immigrant parent. Economic endeavours requiring the use of Tok Pisin are available to the language communities and highly desirable to them. Population centres where Tok Pisin is spoken are readily accessible to all ages and both genders. This contact with Tok Pisin is a force which certainly favours decreased vitality of the Watut vernaculars in the future. It must be considered in conjunction with current language use and other community attitudes in a conclusion about whether vernacular language development is indicated for the area.

5.4 Language use in schools and churches

In Papua New Guinea, churches and schools are hugely influential local institutions. Any use of the vernacular in churches and schools contributes to vernacular vitality. Conversely, churches and schools typically provide great opportunity for community members to learn and use outside languages—specifically Tok Pisin and English—in the Watut context.

5.4.1 Language use in schools

In the 1990s the National Department of Education began a reform of the education system which included plans to gradually open elementary schools throughout the country to provide education in the vernacular for the first three years.[40] Generally, in rural areas speakers of the local language who have completed grade 10 are selected as teachers and sent to a training course. Normally they teach just one grade—elementary prep (EP)—the first year and add elementary 1 (E1) and elementary 2 (E2) in subsequent years. As the elementary school adds grades, the local community school, which normally has grades 1–6, will stop teaching grade 1 and 2 and add grades 7 and 8, becoming a primary school.

There are schools in six of the communities surveyed. There are primary schools in Uruf, Marauna, and Bencheng. There are elementary schools in both the Madzim and Singono hamlets of Babuaf, Bencheng, Marauna, Dungutung and Mafanazo.[41] We were able to speak with teachers from all of these schools except the elementary school in Bencheng and the elementary and primary schools in Marauna.

The Mafanazo community reportedly told the teacher that it is his role as teacher at the English private school to teach children English and the community's role to teach them the vernacular. After a certain time in the elementary school, students are expected to use only English. There are currently 112 children enrolled in the school, which hopes to expand its services to teach adults English as well. The school is waiting for materials. If the community buys the materials, the teachers are willing to start teaching adults.

At the primary school in Uruf, there is a rule that only English and Tok Pisin are allowed in school, but this rule is sometimes ignored. The elementary school teachers in Dungutung teach partly in the vernacular, having translated materials into the vernacular themselves. As reported in section 5.1, the local primary teacher in Bencheng says he explains difficult concepts in the vernacular. The elementary school teacher in Madzim says children are educated partly in the vernacular at school. At Singono the vernacular is not used at school. Thus, there are varying levels at which the vernacular is used in area schools, but it is used at a majority of the elementary schools.

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[40] In rural villages that have one predominant local language, the intent is that the elementary school would be conducted in that language. Elementary schools in linguistically mixed areas often use Tok Pisin as the language of instruction.

[41] The schools in Singono and Mafanazo are private schools and therefore do not receive government funding. They use English instruction rather than a mix of Tok Pisin and vernacular.

The impact on vitality of vernacular use in schools does not clearly lean towards sustainability or decrease. Elementary schools in Bencheng, Marauna and Dungutung contribute to students' knowledge and use of Watut vernaculars. However, this contribution is probably not as strong as it could be if greater emphasis was placed on education in the vernacular. In Bencheng, use of the vernacular to explain difficult concepts at the primary school enables students to make some use of the vernacular to further their education. As is typical of Papua New Guinean schools, though, the schools in the Watut area focus on teaching students Tok Pisin and English.[42]

5.4.2 Language use in churches

Churches provide Watut communities with an equally mixed opportunity to use local vernaculars, Tok Pisin, and English. In order to evaluate language use within churches, we worked through a participatory tool with large groups in each community, interviewed a pastor, and recorded observations of church services.

The results of the participatory tool are largely uniform. In no instance is the vernacular reported to be used exclusively for an activity. However, all ten communities report partly using the vernacular for singing, announcements, youth meetings and women's meetings. In Marauna, the team interviewed a pastor who said that church members translate Tok Pisin songs he teaches them into the local vernacular. All the communities but Bencheng and Uruf report using the vernacular for teaching within church. All but Madzim and Uruf report using it for prayer. The three activities for which the vernacular is not commonly used are liturgy, Scripture reading and Sunday school. Still, Madzim and Dungutung report translating liturgy readings to the vernacular. The same is true for Scripture readings in Madzim and Mafanazo. Thus, all communities make some effort to incorporate the vernacular into church domains.

There are reports from Dangal, Wawas, Marauna and Bencheng that they do not use the vernacular at all for Sunday school. This could reflect a belief that children's education should occur in Tok Pisin or English, or perhaps that Sunday school materials are provided by the church in Tok Pisin. Either way, in these four churches, the one domain which targets children does not involve the vernacular.

The team's observations of weekday evening church services in Marauna and Dungutung, as well as a Sunday morning service in Uruf, confirm reported language use. The local vernacular was used in all three services, though not exclusively for any activity. It was used for singing in Marauna, singing and praying in Dungutung, and singing, praying and announcements in Uruf. Tok Pisin was used exclusively for Bible readings, teaching and liturgy.

Our findings about language use in churches suggest that there are no barriers to sustained vernacular vitality or even vernacular development from the church sector. However, the vernacular is not being used as much as it could be. We are uncertain whether current levels of vernacular use in church domains will continue, increase or decrease in the future.

5.5 Language attitudes

Because the Watut language communities have ample opportunity to learn and use Tok Pisin, their attitudes about vernacular use compared to Tok Pisin use are of key importance to vernacular vitality. We find that while the Watut language communities value their vernaculars overall, this attitude is not so strong that we are certain it will sustain current levels of vitality in all locations.

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[42] In late 2012 the Papua New Guinea government changed the policy for languages of instruction in elementary schools. The new policy mandates the use of English as the primary or only language of instruction. Whether these changes reach the Watut valley—or if they do, to what degree they will change current practice—remains to be seen.

5.5.1 As reported by residents and inferred from behaviour

People are often either reluctant or unable to verbalize attitudes, but attitudes regarding language use can be discovered to some degree by asking about what languages people want their communities and children to use. Additionally, reported use is compared to observed use to examine what the difference says about the communities' attitudes. Discovering attitudes towards language is useful because these attitudes can affect future language use patterns and enable tentative predictions regarding future trends.

In South Watut, Dangal adults report that they scold the children when the children don't speak the vernacular, but they do desire that the children know Tok Pisin in addition to the vernacular. Desire for Tok Pisin is not necessarily anti-vernacular, as multiple languages can be used in complementary ways.

Given that Dangal residents understand that Tok Pisin is dominant in their community, their response is rather too mild to suggest they will do anything to reverse the process in the future. They are content for the vernacular and Tok Pisin to coexist, even, it would seem, at the current ratio..

Residents of Wawas made a strong connection between their language and culture and communicated their intention to preserve the vernacular. When asked how they felt about immigrants who do not learn their language, they responded that immigrants would learn the vernacular after being in Wawas for a time. This sentiment was echoed in every location except for Dangal and Mafanazo; both places say they simply use Tok Pisin if the immigrant does not learn their vernacular.

A variety of language use patterns were observed and reported in South Watut. In general, attitudes in each village corresponded to patterns of language use found there: for example, vital vernacular use and a conscious valuing of the vernacular. Because attitudes are not significantly different from practice, we conclude that current attitudes will not alter future language use in South Watut.

In Middle Watut, Madzim (of Babuaf) and Bencheng expressed their desire that their children learn the vernacular, saying that it must remain. Other Middle Watut villages recognize the practicality or importance of Tok Pisin (and sometimes English). These include Dungutung and Singono (of Babuaf). Even in Madzim, where the vernacular is valued and used, the usefulness of Tok Pisin for communicating with outsiders was mentioned. Marauna expresses a different perspective, saying they are not sure if their culture will remain, and that children must learn Tok Pisin.

Singono is noteworthy for its desire that its children learn English. Both Singono and Mafanazo (in North Watut) are served by private English elementary schools, and their attitudes likely arise partly out of the perception that their children have a real opportunity to learn English. The schools in both locations are only a few years old, so it remains to be seen whether this desire will be fulfilled through these schools.

Interpreting the input given to the team by the Marauna community is difficult. Are they frustrated by the influence of schools and the perception that English and Tok Pisin are going to take over the country, or are they merely resigned? Regardless, the vernacular is already overshadowed by Tok Pisin there, and neither attitude seems likely to change this reality.

In other Middle Watut villages, communities that say they value their vernacular are generally places where it is being used for more functions. Where the community is focussed on education or learning other languages, vernacular was less in evidence. Attitudes towards the vernacular varied from village to village, and a summary statement covering all of them is impossible. As with South Watut, however, attitudes are not significantly different from practice in any of the Middle Watut villages. Community desires, therefore, will not override current trends of language use in each village, however varied those trends may be.

Schools are having a notable impact on North Watut. Residents of Onom and Mafanazo reported the desire that their children learn Tok Pisin and English. In Mafanazo one motive was mentioned: they want their children to be able to talk English to "white people that come".[43]

[43] *ol waitskin i kam.*

Interestingly, in Uruf, where a primary school is located, a desire for English and Tok Pisin was not voiced. Instead, they expressed the desire that their children learn the vernacular. It may be that they are used to the presence of the school and no longer think to express a desire for English and Tok Pisin, since it has been available for some time. Onom, by contrast, exists in its current location solely because of the school, and it could be that their move and the effort to get to school (30 minutes away) keeps them aware of their desire for English and Tok Pisin. Bencheng and Dungutung show an identical trend, where, despite the school in their community, residents of Bencheng express only a desire for the vernacular; while Dungutung, whose children must walk about 30 minutes to the school, say they desire their children to learn English and Tok Pisin as well as the vernacular.

North Watut, with a significantly higher percentage of immigrants than South Watut or Middle Watut, certainly could be influenced toward Tok Pisin. In Onom, the vernacular seems to remain strong. In Uruf, residents' desire for their vernacular to remain appears to be overcoming influences negatively impacting the vitality of their vernacular. In Mafanazo, the draw to English and Tok Pisin was predominant at the time of the survey, and they may find the vernacular decreasing in future years unless their attitude and actions change.

5.5.2 As reported by school staff

Knowing that vernacular medium education is sometimes viewed by Papua New Guinean communities as a barrier to children's acquisition of Tok Pisin or English, we wanted to learn whether there might be barriers to vernacular language development from the educational sector. Our interviews suggest that the level of support for vernacular education will vary by school, but there do not seem to be negative attitudes at any of the schools to such a degree that a vernacular development program in the community would be opposed.

As described in section 5.4.1, many elementary schools in the survey area utilise the vernacular to some extent in school. These schools would probably support a vernacular development program. The primary school in Uruf has a rule that the vernacular may not be used at school, but since this rule is standard at the primary level, reported lenience in enforcing the rule suggests a degree of comfort among the teachers with children using the vernacular alongside Tok Pisin and English. Similarly, the local primary teacher in Bencheng explains difficult concepts and offers clarification using the vernacular, as reported in sections 4.5.3 and 5.4.1.

The community of Singono held the strongest view that vernacular education inhibits children's ability to learn Tok Pisin and English. The elementary school teachers interviewed there teach at Babuaf Christian School, a private English-language school. They say the community feel that students find it hard to succeed in Grade 3 if they use the vernacular in school, so they want children to speak in Tok Pisin and write in English for school. Children are reprimanded for speaking the vernacular in school. However, the community say they believe this policy will not harm the vernacular because the vernacular is part of community life and children are born with it. Thus, in the teachers' view, the community value their children knowing and using the vernacular.

Because Tok Pisin is spoken throughout the survey area, the communication needs of immigrants can be adequately met without the use of a local vernacular. None of the outside teachers we interviewed had learned a local vernacular. In Mafanazo, however, a teacher from the private English elementary school said the community had started to pressure him to learn their vernacular. They were getting impatient with his lack of understanding of it and had started talking to him in the vernacular outside of school to help him learn. His children are nearly fluent in the vernacular, and the community are starting to speak to the children only in the vernacular. This is significant anecdotal evidence for continued vitality, suggesting the community value their vernacular so much they are pressuring a respected outsider to learn to use it.

Children of other teachers have learned local vernaculars. One of the teachers in Bencheng married a local woman and their children speak the vernacular, which he says he is happy about. Another Bencheng teacher's children are learning the vernacular. The head teacher in Uruf has lived there for two years with his family. He has a 14-year-old child who has not learned the vernacular.

Overall, there seems to be no barrier to educating in the vernacular in the survey area. The vernacular is used as a medium of instruction at three of the five elementary schools from which teachers were interviewed. The other two schools are private English elementary schools, and there the vernacular is not used for formal education. Instead, the community believe one of their important roles is to teach the vernacular to the children outside of the school setting. None of the reports from teachers indicate that vernacular language development would be opposed by a school.

5.5.3 As inferred from vernacular use in churches

As mentioned in section 5.4.2, the church is an influential local-level institution. Attitudes of the church towards vernacular language development could foster or hinder continued vitality of the vernacular. Our observations show that vernaculars are being used for some church activities. Thus, far from being opposed to using the vernacular, churches have taken the initiative to write or translate songs in their respective vernaculars. Reportedly, some have done the same for Scripture portions and liturgy.[44]

During the participatory tool about church language use, seven out of the ten communities indicated that they expect or want to use the vernacular for all church activities in the future. Wawas and Uruf left liturgy and Scripture reading unmarked for future vernacular use. Dangal left every activity except for singing unmarked. As discussed in section 4.5.1, shortcomings of the tool make interpretation of the unmarked data difficult, but we think they probably reflect feelings in these communities that the vernacular won't be used for those activities in 2030.

Never during our observation of the participatory tool did a community member express the view that language use in the church is prescribed or that the vernacular should not be used. When the surveyor summarised the tool to check for accuracy in Singono, he said, "In 2030, you want your children to use [vernacular] for all church activities?"[45] There was an overpowering, "YES!" from all sides of the crowd, accompanied by smiles. Although these observations cannot suggest how committed the communities would be to language development in the church, they do suggest that there would be no opposition to such development. We conclude that attitudes towards vernacular development in the church domain are positive and pose no barrier to continued vernacular vitality.

5.5.4 Summary of language attitudes

In the South Watut area, the Wawas community attach a great deal of value to their vernacular and hope it continues to be used. In Dangal, attitudes which favour use of the vernacular are present but probably not strong enough to prevent gradual shift to Tok Pisin. We expect the attitudes of the other South Watut villages to mirror those of Wawas, favouring sustained vitality.

In the Middle Watut area, attitudes towards use of Tok Pisin and vernacular vary by village. Overall, none of the attitudes expressed lead us to believe they will alter current trends in those communities' language use, meaning that some will use more Tok Pisin than vernacular and some will see sustained vernacular vitality.

In the North Watut area, Onom and Uruf emphasize the value they place on use of the vernacular. The Mafanazo community value the vernacular but perhaps not enough to prevent gradual shift to Tok Pisin.

In each Watut language community, therefore, attitudes in at least some villages favour sustained vernacular vitality. Whether these attitudes are strong enough to counteract opportunities to shift to Tok Pisin remains to be seen. This is so especially because many communities would like their children to be fluent in the local vernacular, English and Tok Pisin, and thus do not discourage English and Tok Pisin use.

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[44] Probably on-the-spot oral translation.

[45] *Long 2030, yupela i laikim pikinini bilong yupela i save yusim tok ples Lelom long olgeta sios aktiviti?*

5.6 Conclusions on language vitality

Vernacular vitality in at least some of the communities in each Watut language area is currently strong. The high degree of vernacular use in these communities, including some use in churches and schools, supports this conclusion. It is also supported by the value the communities place on use of the vernacular and their hope that future generations will continue to use it, even wishing to increase use in church domains. Our understanding is that children in these communities speak the vernaculars as well as their parents and grandparents do, and we have reason to believe their children will do the same after them.

In the South Watut area, Wawas, Sanang, Maralangko and Zinimb constitute the core where vitality is strongest. In the Middle Watut area, this core comprises Babuaf, Bencheng and Dungutung. In the North Watut area, the villages with strongest vitality are Dungutung, Onom and Uruf.

The caveat to this conclusion is that vitality of Tok Pisin is also strong. All ages are fluent in Tok Pisin and use it, as far as we can tell, as comfortably as the vernacular. There are thus two options for these Watut communities: either they maintain use of their vernaculars alongside Tok Pisin, or they gradually shift to use of Tok Pisin.

There are economic and social pressures for the communities to use Tok Pisin. Tok Pisin is needed for the pursuit of gold mining and other local industry. It is a convenient language to use with people who immigrate due to marriage. It is also needed for travel to Lae and other population centres. These pressures favour a gradual decline in use of the local vernaculars.

However, the Watut communities also value, to varying degrees, the maintenance of their traditional vernaculars. It is beyond our ability to predict which forces will win out in the future in each community.

Of greatest importance to us is the question of which language or languages will best serve the communities, supposing language development occurs. At present, there is no reason to suggest that development of Tok Pisin rather than the Watut vernaculars would best serve the Watut communities. The fact that Bencheng students grasp difficult concepts more easily in the vernacular than in Tok Pisin is strong evidence that vernacular language development would actually best serve the Watut communities. Use and value of the vernacular in core communities in each language area are strong enough that we do not think Tok Pisin is sufficient for the full realm of communication. At present, we believe the Watut vernaculars would be.[46] We cannot say if and how quickly this situation might change.

6 Goal 2: Interest in language development

Having concluded that a vernacular language development program would be of benefit to the Watut communities, our second goal is to discuss whether the communities are interested in such development. Challenges to assessing communities' interest in vernacular language development have been discussed in section 4.2. As stated in that section, no separate tools or probes were employed to address this goal. Instead, data obtained for other goals or through informal conversation are evaluated here for what they reveal about interest.

In section 5.4.1, we say that most elementary schools in the survey area teach in the vernacular along with Tok Pisin. Communities in which the schools do not teach in the vernacular believe children should acquire knowledge of the vernacular outside school, according to teacher interviews.

Also in section 5.4.1, we relate the report of a Mafanazo elementary school teacher who says the community are frustrated with his lack of knowledge of the vernacular and have begun to teach it to

[46] The only major domain where Tok Pisin is needed is for interacting with outsiders, so it does represent an important—if not necessary—part of their economy. That said, trade with outsiders could be handled by select members of the community who know Tok Pisin; it would not be necessary for the whole community to be fluent in Tok Pisin. Many community members enjoy going to town to purchase store goods and to have a good time; so as long as they have the resources to do this, they will be motivated to know and use Tok Pisin.

him. This is strong evidence that the community do not want to give up the use of their vernacular even though Tok Pisin is an accessible language to them.

In churches, initiative to use the vernacular for various activities has been demonstrated or reported. As stated in section 5.4.2, the Dungutung community report translating liturgy to the vernacular, the Mafanazo community report translating Scripture readings to the vernacular, and the Madzim community report doing both. The pastor interviewed in Marauna says his impression is that the community wish they didn't have to continue relying on the Tok Pisin translation of the Bible; they would prefer a vernacular translation. As all the communities report using their local vernacular in some aspects of church services, all appear to have some level of interest in vernacular development.

Through informal conversations with individuals or formal question-and-answer periods following the completion of the main questionnaire, we came to understand that some communities and individuals are expressly interested in language development. In Bencheng, the local volunteer helping with the Walkabout Questionnaire wanted to know what options are available for the community to have a vernacular language development project. He referred to an earlier survey by SIL in 1990 (see section 2.4) and said that the Bencheng community had since been waiting for somebody from SIL to come start a language development program.

In Dungutung, the community spent much time asking us about the language development process and what assistance SIL offers. They intend to write a letter to SIL requesting assistance. In Uruf, we were also engaged with the community in a lengthy question-and-answer session regarding language development. The team repeatedly had to clarify that we are not translators and do not know if an SIL team will come and work with them.

In Onom, a community leader asked many questions about literacy training, including whether it is meant only for children or for adults as well. He believes that improving the literacy of community members could help the community resolve disputes over land ownership.

All of the data indicate that interest for vernacular development is present in the communities surveyed. This is not an unusual finding in the PNG context, however, so it has limited significance. We do not know the level of investment the communities would make towards such development. Because one purpose of this survey is to suggest what a development program might look like, we were not able to outline specific requirements for participation in a program and ask communities if they are able to meet those requirements. The significant finding for us, therefore, is the absence of apathy about or opposition to the idea of development.

7 Goal 3: Number of ethnolinguistic groups

Since a vernacular development program is indicated in the Watut area, we want to identify the ethnolinguistic groups which might be involved in the program. We'll examine social, linguistic and geographic factors which contribute to groups working together or separately.

7.1 Group identity

Our need to determine how many ethnolinguistic groups are in the survey area gave rise to two research questions relevant to this section of our report: which communities share a common origin, and which communities have the same name for their language or report speaking the same language. We designed two tools and incorporated them as Part 1 of the Main Questionnaire (see appendix D.1).

For the first question, we assumed that groups who identified themselves as the same would relate similar or identical origin stories to reflect their common roots. Table 11 details these stories for the communities that we visited.

Table 11. Summarised origin stories of the Watut River communities

Village	**Story**
Dangal	First came from Sanam[a] to the south. Infighting caused a breakup into Dangal, Wawas, Gumots, Maralangko and Zinimb who are all one group.
Wawas	Two brothers lived "across the river." They fought, and the younger forced the elder to leave. He came down the river and settled Wawas thus: Yangasie to Bitap to Yayani, Utzin, Dambam, Yakdran, Sasan, Yinginakua, Pikipang, Kup, to Wawas Faga.
Babuaf	They claimed to have always lived here and not come from anywhere else.
Marauna	Reportedly came from Jowen in the mountains. There were four clans (Jowen, Baner, Nos and Mulago) and one tribe. The people of Marauna are Jowen. Baner are all the villages on the river on the mountain side. Mulgao are up the river south between Jowen and Baner. Nos are on the Ngati mountain.
Bencheng	Come from Kajalompo near Watut and some still live there now. Half went to the other side of the Watut River as the two sides fought. 5 clans.
Dungutung	Two tribes, Boral and Wagongg, which have two dialects. The original name for the place is Dungutung but Wampan was the name outsiders gave because they lived near the Wampan River. They told us that their village name was Wampan.
Onom	Were on mountains to the west. Moved from Morom to Onom to enable their children to attend the school at Uruf. Have shared the church and school with Uruf for 30 years. Uruf reported that they gave Morom settlers land at Onom to create their current village.
Uruf	All ancestors come from Morom. The Word of God persuaded them to come down. They came down and settled along with some other tribes.
Mafanazo	They came from on top of the mountains. Plangantsu and Besen are now Mafanazo.

[a] This may be Sanang.

The stories share one feature: an origin in mountainous areas. For villagers located in the flat section of the Watut Valley, these mountainous areas are those that border the river floodplain. For communities in the mountainous South Watut area, their origins are further south in mountains that are higher still.

The Babuaf (Madzim to Singono) community are unique in stating that they have always lived in their current location, despite informal conversation indicating that the community have spread from Madzim downriver to its current extent in order to prevent rivals from taking land they claim as theirs. It is possible that this is a more recent development and not considered in their origin. It is also notable that Uruf stated its origin as Morom. This was in fact the only community that placed its origin in any other known existing community (but see the table 11 note).

There are several factors which seem to have influenced those communities which have moved. Conflict, the influence of missionary and colonial administrations, trade and education are the prime motivators and, in most cases, combinations of these. Considering the impact of gold on the current economic status of these communities, it is surprising that none of them mentioned it as a motivation for population movement. However, it could be that, as this is a relatively recent part of their history and because we requested their origin stories, they do not consider it to be part of that genre.

In addition to origin stories, we asked communities to state their vernacular and identify any other communities that also used the same. Results for this can be seen in table 12.

Table 12. Reported ethnolinguistic groupings

Village Reporting	Vernacular Label	Others reported to use it
Dangal	Nan Dangar	Wawas, Gumots, Sanang
Wawas	Nan Kagir	Wawas, Gumots, Dangal, Maralangko, Sanang
Babuaf (Madzim)	Lelom	Singono (Babuaf), Bencheng, Marauna
Marauna	Zowenz	
Bencheng	Changg	
Dungutung	Boral, Wagongg	
Onom	Mpubunum	Babuaf, Uruf, Mafanazo, Dungutung, Bencheng, Marauna
Uruf	Wagung	Morom/Onom, Mafanazo
Babuaf (Singono)	Lelom	Madzim (Babuaf), Bencheng, Marauna, Mafanazo, Uruf, Morom, Wawas, Zinimb, Maralangko
Mafanazo	Uya'amah	Uruf, Morom/Onom

Aside from the fact that Singono and Madzim claimed to be two hamlets of the same village, the data indicate that no communities share the same name for their vernaculars. Despite naming them differently, as just described, a number of communities mutually reported using the same vernaculars, as in table 13.

Table 13. Communities who both claimed to use the same vernacular

Wawas↔Dangal	Madzim↔Singono	Onom↔Singono
Onom↔Mafanazo	Uruf↔Mafanazo	Onom↔Uruf

When combined with the variety of origin stories reported earlier, this seems to indicate that communities in the valley, despite sharing some similarities, consider themselves distinct from each other. Despite the independent identities of the Watut communities, they commonly reported that they considered themselves separate from anyone living in the ridge of mountains in the east towards Mumeng.

There are indications that current ethnic identity is being moulded by outside influences. Many communities had acquired the skills of canoe-making in past decades from Sepik settlers farther downstream on the Watut River, for example, and all communities reported frequent access to outside supplies. Communities reported that Tok Pisin was a valuable language to know and that many of the motivators for their activities originated outside their language area, e.g., sale of gold in Bulolo, purchase of goods in Lae, etc. The extent to which these activities have influenced their sense of ethnic identity is difficult for us to know. In summary, though, there are strong indications that the communities of the Watut, both collectively and individually, have a clear sense of their ethnolinguistic identity.

7.2 Reported language and dialect boundaries

In Part 1 of our Main Questionnaire the community reported how similar the vernaculars of other villages were to their own (see appendix D.2 for the tool rubric). This resulted in the data shown in table 14.

Table 14. Reported similarity of speech for Watut River communities

Villages below report on those to the right	Sanang[1]	Dangal	Gumots	Wawas	Maralangko[a]	Zinimb[1]	Madzim	Singono	Marauna	Bencheng	Dungutung	Onom	Uruf	Mafanazo	Chiats[b]
Dangal															
Wawas															
Madzim															
Singono															
Marauna															
Bencheng															
Dungutung															
Onom															
Uruf															
Mafanazo															

[a] The communities of Sanang, Maralangko and Zinimb were not visited. Only the South Watut communities of Dangal and Wawas mentioned Sanang.

[b] The vernacular of Chiats was considered by all as different except for three communities, who say that only a little of their speech could be understood. These three, Wawas, Marauna and Mafanazo, are notable for travel and trade along the Watut River. Mafanazo has a market three times a week on the riverside and motorised canoes were said to be available from these three villages in particular. They are therefore more likely to be familiar with speech from Chiats through contact and it is possible that this is in fact what they reported.

Key:	
	speech that is exactly the same as the vernacular of the reporting village
	speech that is different but a lot is understandable
	speech that is different and only a little can be understood
	communities that speak differently and cannot be understood
	no data or data unnecessary

By placing the villages in somewhat geographical order, the green areas in table 14 indicate that there are three possible groupings of languages based on reported similarity and that these correspond to the language areas described as North Watut, Middle Watut, and South Watut in the *Ethnologue* (Lewis, 2009).

Data reveal that the most defined group consists of Sanang, Dangal, Gumots, Wawas, Maralangko and Zinimb, with the latter two differing more in their speech. This reflects Holzknecht's classification of the two dialects that comprise the South Watut language area (1989:33–34). The community groupings for South Watut, including its dialects, were further confirmed by an informant who acted as a guide early in the survey.

The second-most clearly defined group consists of Dungutung, Onom (Morom), Uruf and Mafanazo. However, Dungutung identifies with both North Watut and Middle Watut, which corresponds exactly with Holzknecht's data as described in section 2.4.

The Babuaf hamlets of Singono and Madzim represent the geographic extremes of the third area, where there is much less sociolinguistic agreement. While this area has been classified as Middle Watut there is clearly less sociolinguistic homogeneity here than elsewhere in the valley. As table 12 shows, three communities (Marauna, Bencheng, Dungutung) within this area mentioned no others when asked which other villages spoke their vernacular, insisting that they were the only speakers of the particular vernacular they had named. Despite this, Dungutung went on to say that Bencheng spoke exactly the

same as they did. Nevertheless, there seems much less inclination for communities to acknowledge linguistic unity in the area classified as Middle Watut. As detailed in section 7.3, lexicostatistical analysis of wordlist data supports this apparent lack of linguistic unity.

When the correspondence of mutually reported vernaculars occurred during our data collection (see table 13), communities always, with one exception, went on to indicate that their speech was identical. The exception was Onom and Singono. These two communities, despite initially reporting that the other spoke the same vernacular as themselves, went on to report that the speech of the other was not identical to their own but rather different, although easy to understand. Onom villagers were obviously migrants to land on the west of the river. Those in Singono were adamant that they had not migrated to the area and had always lived at that location to the east of the river. In addition, respondents in Madzim who claimed to be one and the same community as Singono (a fact Singono residents reiterated) did not report sharing the same vernacular with Onom. Why Singono and Onom communities should identify each other as speaking the same vernacular is therefore puzzling. A further example of apparently incongruous data came from Dungutung, which, along with Bencheng and Marauna, reported that no one else speaks their vernacular. Dungutung residents then said that Bencheng and Uruf speak exactly the same as they do.

Other reports of language or group boundaries:

- Dangal residents reported that the whole Watut Valley speaks one language, despite saying that they could not understand the speech of any community north of Dungutung. An informant here also told us that Gumots, Wawas and Zinimb share the same origin story, a fact we were unable to confirm as we were unable to visit Gumots or Zinimb.
- At Bubuparum, a very small village between Wawas and Dangal, we were told that Dangal and Wawas speak exactly the same language, Maralangko and Zinimb speak the same language but a different dialect, and from Marauna north it is a different language.
- Marauna residents reported that Onom residents were one group with Uruf. Onom villagers confirmed this, identifying themselves as Uruf, Morom, and Mafanazo, together with one language which changes from Dungutung south. They also said that they can understand the language spoken in Singono but can only respond in Tok Pisin.
- Uruf was the only place where possible language shift was reported to us. Our host said that only he and one or two other individuals know the true vernacular which he labelled as Mpubunum. He went on to say that young people speak Wagung, a label used in nearby Dungutung for one of its dialects. When asked about whether it was in fact the same as that of Dungutung, they disagreed but couldn't readily give a reason for it being the same name except perhaps that it was due to people married in.[47]

In summary, reported data confirms the existing classification of the survey area into three language areas as detailed in section 2.1. However, while the language areas of South Watut and North Watut are more clearly defined linguistically, Middle Watut is more complex. Certainly, these villages are distinct from either South Watut or North Watut language communities. But it would be erroneous to assume that villages in what is currently known as Middle Watut form a single, defined, homogenous language community. It would be more accurate to conclude from our data that there are sociolinguistic boundaries of varying degrees between Marauna, Bencheng, Dungutung and Babuaf. Further study is needed before we can comment on the strength of these boundaries in either social or linguistic terms and conclude whether the use of one language name for these communities is appropriate.

[47]See section 5.1.3 above for further discussion.

7.3 Etic comparison of language data

The linguistic similarity groupings reported in the previous section concur with groupings suggested by etic evaluation of language data. Findings from our lexicostatistical analysis, detailed in section 8.2, are evidence that there is a strong linguistic basis for the community reports described above. The highest apparent cognate percentage between any pair of varieties is 89%. Given that none are higher, this suggests that, as reported by some communities, each village's vernacular has its own unique characteristics.

Apparent cognate percentages show great linguistic similarity among the southern villages of Dangal, Bubuparum and Wawas.[48] There is more variation among the Middle Watut varieties, as reported by residents. At geographic extremes within this group are two closely related sub-groups: Madzim and Marauna in the south, and Wagongg and Boral in the north. The Bencheng variety is equally similar to Madzim and Boral, so it lies in the middle, linguistically as well as geographically. Wagongg and Boral are both spoken in Dungutung, but with varying degrees of similarity to the other Middle Watut varieties, which explains why residents give mixed reports about the similarity between speech from Dungutung and other Middle Watut villages. Lastly, the northern varieties of Onom, Uruf and Mafanazo have as a group the greatest similarity of all the Watut varieties, based on apparent cognate percentages.

In section 4.3 we presented Holzknecht's case that lexicostatistical analysis is an unreliable way to hypothesise about linguistic groupings. Her own evaluation of linguistic data is much more reliable for our purposes. Community reports and findings from our lexicostatistical analysis concur exactly with her reported variety groupings. She reports that one variety of South Watut is spoken in Dangal, Wawas and Gumots (1989:31).[49] She reports that Dungutung, Marauna and Bencheng speak Middle Watut, but that Dungutung's population speak two varieties, one of which is more similar to North Watut (ibid., 33–34). This is supported by our data, which suggest that the Wagongg variety in Dungutung is nearly as similar to North Watut as it is to Middle Watut. Finally, she reports that North Watut is spoken in Uruf, Mafanazo and Morom, a conclusion supported by our own findings (ibid., 34–35). Thus, community reports given to us, findings from our lexicostatistical analysis, and Holzknecht's research are all in agreement regarding linguistic groupings among the Watut villages.

7.4 Willingness to work together

We used section 3 of the Main Questionnaire to gather data to make inferences about the willingness of the communities along the Watut River to work together. This section included probes that were aimed at retrieving data on two topics: 1) asking communities about traditional enemies and current disputes to determine if any existing animosity would hinder a joint language development project; and 2) activities that communities are already engaged in together, to determine if existing relationships could support cooperation in a language development project.

7.4.1 Traditional enemies and current disputes

All but two villages—Dungutung and Dangal—reported the names of communities or language groups that were their enemies in times past. Dungutung told us they did have enemies in the past, but were

[48]As we were unable to visit Maralangko or Zinimb, we had no data for these varieties to use in a lexicostatistical comparison and have no further comment to contribute to the understanding of how these villages relate linguistically to their neighbours.

[49]Holzknecht reports that Maralangko and Zinimb speak a second variety of South Watut (1989:31). This was confirmed by what we heard anecdotally during the survey, but our inability to visit these villages means that we could not contribute more to an understanding of the situation through our lexicostatistical analysis.

reluctant to name them, while Dangal said that they would only fight with people who attacked them first, but again chose to not list them. All of this points to a time in the past when there was quite a bit of fighting between communities, including between the Watut language groups.

Despite this tumultuous past all the communities reported that they now live in a time of peace. Most communities referenced the coming of Christianity as the reason for reconciliation, saying: "the time of fighting is over, God's Word has come", "peace has come through God's Word", and "all are Christians, we sit down as brother and sister".[50]

It seems unlikely that any of these past disputes will have an impact on a language development program. As evidence that they live in peace with some of their former enemies, a few communities commented that they now intermarry with them.

Current disputes are more likely to have an effect on a language development program. In an area as resource-rich as the Watut River Valley it is not surprising to find disputes involving land claims. There is one gold mine close to the Watut River Valley, but many mining companies have sent exploration teams into the valley in an attempt to find another vein worth mining. If they find one, whoever controls the land will be in a position to demand compensation. With the fear of losing money that should be theirs, most communities are involved in ongoing disputes with other communities trying to claim their rightful land.

With so many disputes around, it was quite surprising to find that almost all of these disputes were with communities of other language groups, not internal to the Watut vernacular communities. In Marauna they informed us that there are no disputes within their language[51] because they have ways of dealing with all internal issues quickly. All lingering disputes are with communities outside their language group.

The only communities to report current disputes with other communities in the North Watut, Middle Watut, and South Watut languages were Onom and Uruf. Onom reported a current land dispute with Uruf, though surprisingly Uruf did not report the same. Uruf did, however, report land disputes with communities on the other side of the river, including Singono. Singono did not report this dispute.

The Onom/Uruf land dispute began when some of the people of Morom moved closer to Uruf to access the school there. The people of Uruf gave them some land to live on and this is where Onom now stands. This movement happened around 30 years ago. It seems that some of the finer details of the arrangement have yet to be worked out. The people in Uruf did not report this dispute, but we can't be sure what this means.

When the Uruf community was initially asked if they had any current disputes, they said "no," but after the silence that followed they reported that they had land disputes with the other side of the river, the "Mumeng side". They then further clarified by adding Singono into what they were calling the Mumeng side of the river. We are unclear exactly what this land dispute is about, and given that it was reported by only one party, it seems to be minor. Also, because Singono would be working with Middle Watut and Uruf with North Watut, this land dispute is unlikely to have a serious impact on a language development project.

7.4.2 Joint activities

To gather information on what current relationships exist between the communities of the Watut River Valley we queried about five relationships that typically exist between communities in PNG: having a trade relationship or going to market, inter-marrying, having regular combined worship services, joining

[50] *Pasin birua pinis Tok bilong God i kam* from Marauna, and *pis em i kam long tok bilong God* from Onom. The final quote was given in Dangal and translated on the spot into English by our team member. The original Tok Pisin statement was not recorded.

[51] When asked to clarify what they meant by their language, they responded that all the communities we had just talked about in the joint activities PM tool were in the same language group. This understanding of one *tok ples* in the valley was shared in many of the communities we visited.

with a community for traditional activities, and volunteering to work with another community in a joint project.[52]

We also asked each community where their children go to school, marking when a community send their children to another community for schooling as an extra tie. This makes a total of six possible ties between villages, using our methodology.

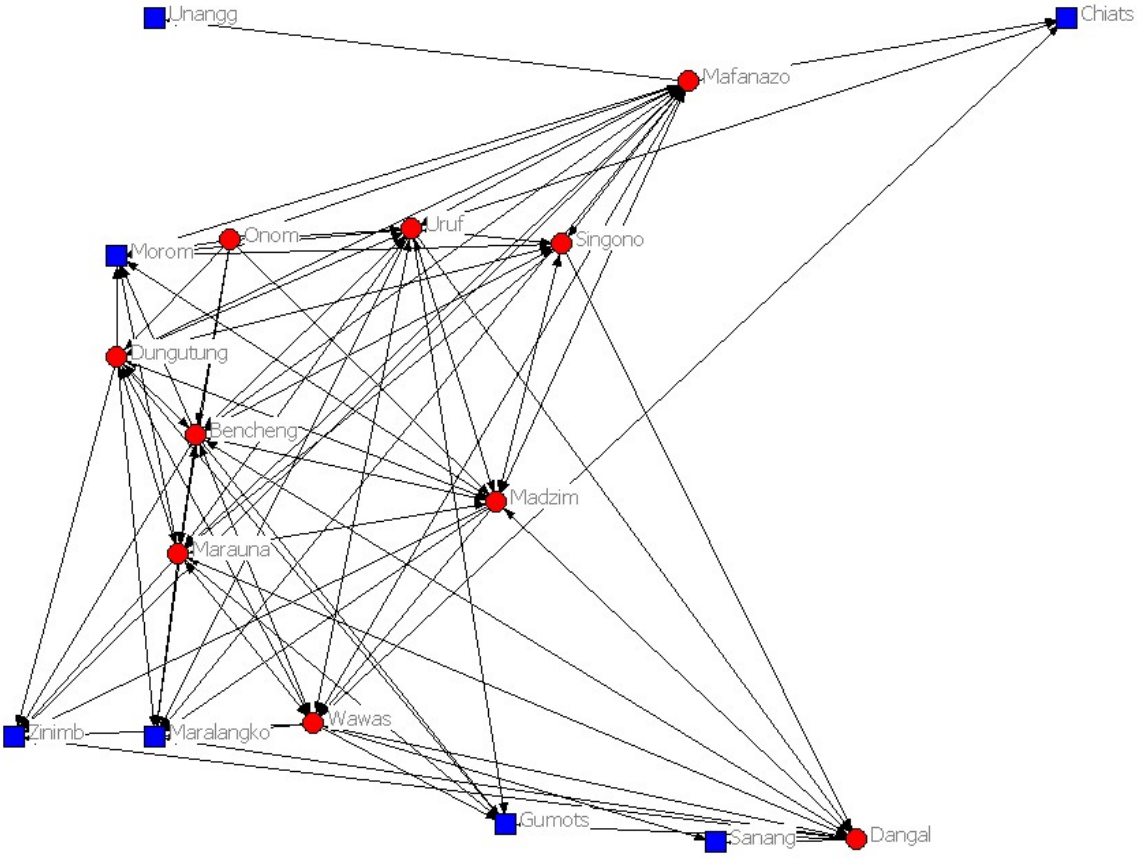
The analysis relies on quantitative data—in this case—the number of ties between communities. Data points are entered into the NetDraw computer program (Borgatti:2002).[53] This program represents the data visually in the form of social network diagrams. To use this tool we assigned each tie a value of 1 since it would be impossible for us to determine with accuracy which, if any, of the given relationships is more important than the others and to what degree. This gives a community reporting all possible ties with another community a score of 6 and community reporting no ties with another community a score of 0.

This analysis is not meant to be a comprehensive social network mapping of the Watut River Valley. It is only meant to discover if ties between villages exist, in an effort to determine if there would be any hindrance to joint work in a language development program.

Figure 1 shows all the connections that were reported. Each line represents a connection between villages. Arrows on the lines indicate who reported the connections. For some lines there are arrows on both sides showing that the connection between villages was mutually reported. Each line could indicate between one and six possible ties. It is easy to see that there are many connections between the communities of the Watut River Valley.

[52] These were expressed to the communities in Tok Pisin as *wokim tret o maket, wokim pasin bilong marit, bung lotu, wokim singsing o kainkain pasin tumbuna,* and *wok bung*.

[53] NetDraw is a free program written by Steve Borgatti for visualising social network data. It is available online at http://www.analytictech.com/Netdraw/netdraw.htm



Note: The red circles represent communities we gathered data from, while the blue squares represent communities we did not visit.

Figure 1. All ties between villages.[54]

If we only show those connections which include four, five, or six ties, as in figure 2, patterns begin to emerge. The inter-connectedness of the Middle Watut and North Watut communities is easy to see, while at the same time the lack of connection to Chiats, a community from another language, is revealed. It can also be seen that even though Singono is physically closer to the North Watut communities, it is connected more with the Middle Watut communities, with whom it identifies (see sections 7.1 and 7.2). Finally, we can also see the relative division of South Watut from the other communities. Only Wawas has any connection at this level outside of South Watut, and only to the next closest community. Internally, South Watut is not very connected either. Our data for South Watut are incomplete because we were able to visit only two of the six communities, but a low number of ties would be expected anyway based on the difficult terrain (see section 7.5).

[54]Initially we queried about “Babuaf” and “Singono” but soon discovered that all people linked Madzim and Singono under that name. We then queried about “Madzim” instead of Babuaf so we could see how people related to these two hamlets of Babuaf, since they are geographically quite distant from each other. In figure 1 the two hamlets are labelled,“Madzim” and “Singono”.

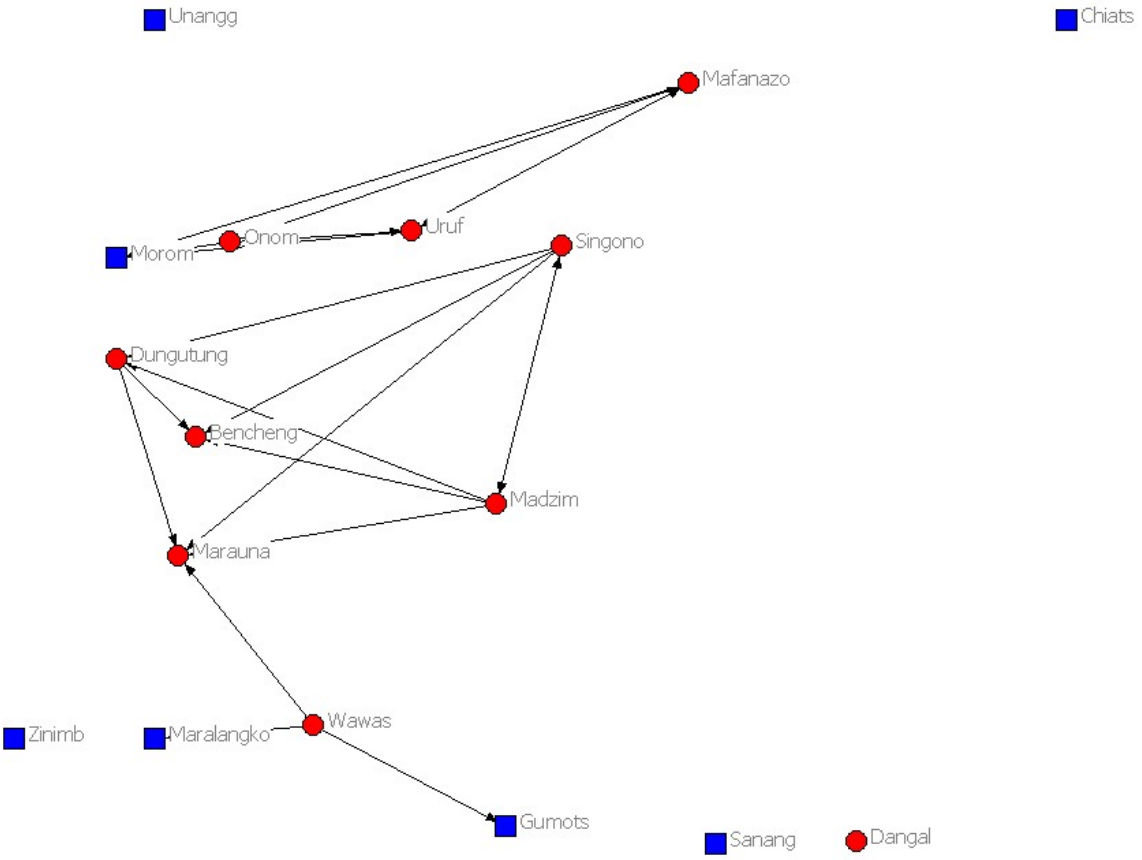


Figure 2. Four or more ties.

…The only reported disputes between villages of the Watut languages were between Onom and Uruf, and between Uruf and Singono. Before they reported the dispute, the people of Onom had reported they shared many ties with Uruf, in fact, the most ties they could report with our tool, six. Uruf reported that they share five different ties with Morom (linking Onom and Morom), the maximum number, since neither Onom nor Morom has a school. This dispute should not prevent cooperation between these two communities in language development.

Similarly, Uruf reported two ties with Singono before informing us of the dispute between the two communities. They reported that they sometimes trade with Singono and that they intermarry with them. The people of Singono reported the same two ties between the communities, though they did not report the dispute. This shows, especially with the existence of in-laws in the communities, that the dispute should not hinder cooperation in a language development project.

7.4.3 Conclusions

Looking at the reported traditional enemies and current disputes as well as the joint activities, it seems as though neither of the former will be a hindrance to a joint language development project in the Watut River Valley. Though there was a time when many of these communities fought with one another, most disputes are now with communities outside the Watut languages. Regarding those disputes that currently involve communities of the Watut River Valley, the social ties seem to show that these disputes will not prevent these communities from working together in a language development project.

The reported joint activities give the sense of a well-connected area (with the exception of the geographic isolation of the South Watut communities), and we therefore conclude that a language

development project would not be hindered by a lack of continuity among the communities of the Watut River Valley.

7.5 Geographical features

The geography of the Watut Valley is quite varied, and in some areas it has a marked impact on travel patterns and therefore on the amount of interaction between villages. See section 2.2 and especially map 2 for locations and terrain.

The two hindrances to travel are the mountains and the river, though of course the latter also serves as a travel route. It is primarily the South Watut community who live in the mountains. Given our own limited travel in this area it is difficult to say how and where people travel with any confidence, but we can say that it is partly due to the mountains that the community of Dangal (and probably Sanang) go southeast to Mumeng and Bulolo, while the rest of the population of the Watut Valley travel north on the Watut River to 40-Mile, thence to Lae. For this reason, the residents of Dangal seldom travel to other Watut villages. The man who volunteered to be our guide had not been on the portion of the trail between Bukandu (a hamlet of Dangal, but a hard day's walk distant) and Bubuparum (a hamlet of Gumots near the Watut River).

Dangal and Sanang are probably the most extreme examples of places where travel is hindered by geography, but Gumots and possibly Maralangko and Zinimb are at least half a day's travel from the Watut River, where they would then have to arrange for a canoe to transport them the rest of the distance. We did not get the impression that any of the South Watut communities travelled to any of the other South Watut communities for the sake of visiting, but only if they were on their way to town.

In Middle Watut and North Watut the land is mostly flat, and travel is therefore easier, though swampy areas may pose a difficulty during the wet season. The exception is Morom, up in the mountains on the west side of the valley. It is a cul-de-sac, and given that only twelve houses were reported to be there, it is unlikely that non-residents visit. The old centre of Marauna is similarly on a spur trail. Except for these, all villages are more or less in a line and one travels through them if one is walking. Given that many people take canoes to town, however, villages off the river are generally bypassed by these travellers.

The Watut River also serves as a boundary. In Middle Watut and North Watut the only community on the east side of the river is Babuaf. Even though some of the hamlets of Babuaf (Singono and Wonkinch) are geographically closer to the North Watut communities, the river is a factor in keeping them connected to the other Babuaf communities, and therefore Middle Watut, by limiting travel to and from the North Watut communities. The team travelled from Uruf to Singono by canoe. When we dropped off a group of women from Uruf on the east side of the river near Singono, the fact that they travel only infrequently to this side of the river was clearly demonstrated when immediately the group split in two and started off in different directions and then could not agree which was the correct way.

Geography certainly contributes to the ethnolinguistic groupings of the languages of the Watut area. The difficult terrain has isolated the communities of South Watut from each other as well as from the other Watut communities. In Middle Watut and North Watut the river encourages the hamlets of Babuaf to continue identifying with Middle Watut.

7.6 Conclusions on number of ethnolinguistic groups

There is sufficient evidence to suggest that the South Watut, Middle Watut and North Watut language communities share a common, high-level identity which distinguishes them from neighbouring non-Watut language communities. They also seem to have positive relationships with each other. This leads us to suggest that they would be amenable, from a social standpoint, to joining together in one language development project.

Linguistic differences cause us to recommend that separate materials be developed for South Watut, Middle Watut and North Watut. In the South Watut area, we were not able to investigate reports that Maralangko and Zinimb speak slightly differently than Dangal, Sanang and Wawas. It is possible that

there are two varieties of South Watut, and further research would be required to determine whether one set of materials would serve both.

In the Middle Watut area, the communities do not feel linguistic similarity with one another to the degree that is felt in South Watut and North Watut. Such feelings are supported by percentages from the lexicostatistical analysis, which show less linguistic uniformity than South Watut and North Watut. It is again possible that two sets of materials would be necessary to best serve the Middle Watut communities, but as in South Watut, further research would be required to confirm this.

The North Watut communities would likely be able to work together to produce one set of materials. There is still question as to what involvement the Dungutung community might have in language development undertaken in the North Watut language. According to the lexicostatistical analysis, its Wagongg variety is almost as similar to North Watut as it is to Middle Watut.

8 Lexicostatistic comparison

Standard SIL-PNG, 170-item wordlists were elicited in 11 of the 12 villages and hamlets visited on this survey.[55] These language data formed the basis for our lexicostatistical analysis, which lends support to the conclusions drawn about ethnolinguistic groupings in section 7. In particular, the analysis supports the view that Dangal, Bubuparum and Wawas form a linguistic subgroup in the south; Madzim, Marauna, Bencheng, and Dungutung form a linguistic subgroup in the middle; and Onom, Uruf and Mafanazo form a linguistic subgroup in the north.

Because the set of percentages resulting from our analysis must be interpreted in light of our particular methodology, we begin our discussion with a summary of the major methodological considerations. This is followed by a presentation of the results and discussion of the significance for a program. A more detailed description of the methodology is presented in appendix B

8.1 Overview of methodology

A lexicostatistical comparison can emphasize differences among Papua New Guinea languages (Wurm and Laycock 1961:135), and we capitalised on its ability to do this because of how we hoped to use the results. We wanted our findings to reveal something about the linguistic variations between the Watut communities. This is because our analysis is meant to inform our third goal of determining the number of ethnolinguistic groups in the Watut area, as detailed in section 4.3. Our attention to subtle differences helps us to suggest where language development might begin if it does not include the whole Watut area, or what ethnolinguistic subdivisions would be involved in a project that does include the whole area, as detailed in section 8.2. The following paragraphs describe various issues encountered during comparison, and the strategy used for grouping apparent cognates.

We compared wordlists using the analytical software WordSurv Version 7.0 (Colgan and White 2012). Lexical items were grouped as apparent cognates using the methodology described by Blair (1990:31–32). We adhered to this methododology except for departures listed in appendix B.8, which primarily reflect suspected transcription inconsistencies. Using Blair's methodology resulted in many items being grouped differently, even though inspection suggested apparent cognates. For example, see 39 'bird', depicted in figure 3. Had we grouped apparent cognates based on our own inspection, our resulting similarity percentages would have been higher.

[55]See table 9 note in section 4.4 for an explanation of why no wordlist was elicited in Singono.

Variety	'bird'	Grouping
Dangal	marŋk	ab
Bubuparum	maraŋ	a
Wawas	maraŋ	a
Madzim	maŋg	b
Marauna	maŋk	b
Bencheng	mæŋ	b
Dungutung (Wagongg)	maŋg	b
Dungutung (Boral)	maŋq	b
Onom	maŋc	b
Uruf	maŋc	b
Mafanazo	maŋk	b

Figure 3. Grouping for item 39 'bird'.

Sometimes, inspection led us to believe that a root was apparently cognate in all varieties, but that some of the varieties had an added component which would not allow them to be grouped with the rest by Blair's methodology. For example, inspection of item 18 'forehead' (in figure 4) suggests that all varieties have a root which is apparently cognate, but Onom and Uruf have an additional component *[-lele]* which causes them to be grouped separately in our analysis. This exemplifies a case where we did not have reasonable grounds to identify the extra component as a separate morpheme and ignore it in the comparison, so we included it.

Variety	'forehead'	Grouping
Dangal	damba	a
Bubuparum	damba	a
Wawas	damba	a
Madzim	dampam	a
Marauna	dãnpa	a
Bencheng	dampa	a
Dungutung (Wagongg)	dampam	a
Dungutung (Boral)	dampa	a
Onom	dampalere	b
Uruf	dampalele	b
Mafanazo	dampa	a

Figure 4. Grouping for item 18 'forehead'.

However, there are instances when a morpheme appeared to be added to the root in some varieties and we felt confident we could identify it (e.g., it was an exact doublet with another item for those varieties). Consider as an example the grouping for item 98 'smoke', pictured in figure 5. Comparing the terms for 'smoke' with the terms for 'fire', item 97, shows that five varieties incorporated the term for 'fire' in their term for 'smoke'. In cases such as this, we ignored the doublet portion and compared what we felt to be the portion with equivalent meaning across varieties. This is as opposed to excluding the entire term for the varieties with doublet portions from the comparison. This resulted in an increase in the overall number of items compared.

Variety	'smoke'	Grouping	Notes	'fire'
Dangal	sumua-muaŋun	b	ignore sumua	sumua
Bubuparum	sumwa-mwaŋun	b	ignore sumwa	sumwa
Wawas	mumɔŋun	b		sumuɔ
Madzim	saŋasoŋ	a		suŋo
Marauna	saŋa-suŋ	a		suŋo
Bencheng	sæŋæsoŋ	a		sɪŋʊ
Dungutung (Wagongg)	saŋasoŋ	a		siŋu
Dungutung (Boral)	saŋa-soŋ	a		siŋu
Onom	iahasuŋ	c	ignore iah	iah
Uruf	jah-hasuŋ	c	ignore jah	jah
Mafanazo	jaʰ-hasuŋ	c	ignore jaʰ	jaʰ

Figure 5. Grouping for item 98 ‘smoke’.

There are times when terms would have been grouped separately according to Blair’s methodology, but we felt doing so would not reflect an actual difference but rather a potential variation in pronunciation on the part of the informant or transcription on the part of the recorder. In these cases, usually involving terms of only two or three phones, we grouped the terms as apparent cognates. An example of this is the grouping of Dangal, Bubuparum and Wawas together for item 108 ‘tree’, depicted in figure 6. According to Blair, Bubuparum’s two-phone term should not be grouped with the three-phone terms in the other two varieties. However, the presence or absence of an [i] could have been a transcription inconsistency based on the palatal influence of the [dʒ], so the varieties were grouped together in a departure from Blair.

Variety	'tree'	Grouping
Dangal	ʤia	b
Bubuparum	ʤa	b
Wawas	ʤia	b
Madzim	ga	a
Marauna	ga	a
Bencheng	ga	a
Dungutung (Wagongg)	ga	a
Dungutung (Boral)	ga	a
Onom	ga	a
Uruf	ga	a
Mafanazo	ga	a

Figure 6. Grouping for item 108 ‘tree’.

As described, our methodology for grouping apparent cognates does not emphasize differences between the varieties to the greatest extent possible, but does so more than simple inspection would. Results of the comparison must be considered with the expectation that percentages are lower than one might expect for three closely related languages.

8.2 Lexical similarity comparisons and interpretation

Table 15 presents apparent cognate percentages resulting from our analysis, with percentages of 74 and higher bolded for easy reference.[56]For each pair of varieties, a percentage is derived from two numbers: the total number of lexical items compared between the two varieties, and the total number that were grouped as apparent cognates. As such, apparent cognate percentages represent linguistic similarity only within a very restricted data set, and do not account for aspects of the varieties such as grammar. Also, as cautioned in section 8.1, the methodology for grouping apparent cognates is unique to this survey and resulting percentages are not comparable to percentages resulting from lexicostatistical analyses in other studies, at least not without careful comparison of the methodologies in question.[57]

Table 15. Apparent cognate percentages[a, b]

Dang										
81	Bubu									
81	**78**	Wawa								
45	39	45	Madz							
44	38	46	**83**	Mara						
44	35	44	**80**	**76**	Benc					
39	29	41	**75**	**74**	**80**	Bora				
36	30	40	68	64	**74**	**83**	Wago			
33	29	34	52	50	57	63	66	Onom		
31	26	31	52	50	55	64	65	**89**	Uruf	
34	29	35	53	48	56	59	63	**84**	**80**	Mafa

[a] Variety names have been shortened to the first four letters.
[b] The methodology used for this comparison emphasises differences, so percentages are lower than one might expect for three closely related languages.

A glance at the bolded figures in table 15 suggests three main linguistic groupings among the Watut villages. The first is Dangal, Bubuparum and Wawas. The varieties in this group are quite distinct overall from the outside varieties, as percentages are roughly cut in half when one compares varieties outside the group to those inside.[58]This suggests that Dangal, Bubuparum and Wawas would likely constitute a linguistic subgroup in a language development project.

The second group includes Madzim, Marauna, Bencheng, and the two varieties of Dungutung, Wagongg and Boral. The most closely related pairs within this group are Madzim and Marauna, which are 83% similar, and Wagongg and Boral, also 83% similar. These constitute two closely related sub-groups at geographic extremes within the second group. Between them, Bencheng is equally similar (at 80%) to Madzim and Boral. This suggests Bencheng may be the most widely understood of the varieties in this group, and the best choice for development if only one variety in the group were to be developed.

Marauna and Wagongg are the least similar pair within the second group, at 64%. In fact, Wagongg is less similar to Marauna than it is to Onom and Uruf in the third group. This is evidence that similarity within the second group is lower than similarity within the first and third groups. And finally, Madzim, Marauna and Bencheng are all more similar to Boral than they are to Wagongg. This suggests that if only one of the Dungutung dialects was to be developed, Boral might be the most feasible choice.

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[56] In our data, there is a significant gap between 68% and 74%. Higher percentages were bolded to highlight the most similar varieties.
[57]See appendix B.9 for the number of items compared.
[58]It is unfortunate that we were unable to collect wordlists in Maralangko or Zinimb. Had we done so, we may have found that these varieties were more similar to varieties outside of the first group.

The third group includes Onom, Uruf and Mafanazo. Within this group, Onom and Uruf are most similar and Uruf and Mafanazo are least similar. Together, these three varieties constitute the most similar group of Watut varieties overall. This similarity could provide them with a strong basis for support for language development.

Comparing varieties within the third group to those outside shows the geographically less distant villages are generally more closely related. The nearest varieties in the second group, Wagongg and Boral, are fairly similar to the varieties in the third group. This means that if two of the three groups were to be engaged in joint language development, it would likely be easiest and most fruitful for the second and third groups to work together.

Overall, it is noteworthy that the highest similarity is 89% between Onom and Uruf. This supports community reports that individual villages are linguistically unique.

8.3 Critique of methodology

Four different surveyors transcribed wordlists. This invited inconsistencies between transcriptions which ultimately may have affected the similarity percentages. We decided not to assign the transcription of wordlists to one surveyor because more than one team member needed experience recording wordlists, and the team were also trialling new tools and wanted to take turns in different roles so that critique of the tools could be collaborative. We have taken steps to minimise the skewing of the results due to transcription inconsistencies, as detailed in appendix B,1 and B,8,.

In Uruf the team was told that there were a few elderly people who know the ‘true vernacular’, and that younger generations do not. A wordlist was elicited from one of these elderly people and may not, as such, be fully representative of the majority of Uruf’s population. In retrospect it may have been helpful to get a wordlist from both groups, though note that this is a common statement and we are uncertain of its meaning.

9 Conclusions

We recommend that all three Watut language communities would benefit from a vernacular language development program, and all three are interested in this type of development. They would likely be willing to work together, although separate materials would probably have to be produced for each. There may even be a need for two sets of materials within South Watut, one serving Maralangko and Zinimb and one serving the other villages. Similarly, there may be a need for two sets within Middle Watut, one serving Babuaf and Marauna, and one serving Dungutung, with Bencheng probably able to use either set. Further research is needed to determine this.

Although the South Watut, Middle Watut, and North Watut communities may all be willing to work together in one joint development program, geographic constraints would make travel difficult, particularly for the South Watut villages. Any training or workshops held in Lae would likely be accessible to all three language communities, whereas events hosted within the Watut Valley may not be. In fact, because Lae is frequented by members of all three language communities, it would be feasible to reach all three with workshops held in Lae geared to gauge interest in, and level of commitment to, a vernacular development program.

Although a joint development program including all three language communities would likely be feasible, it would be a huge project. The varying needs and levels of interest within any one language community would challenge a development project. Due to the difficulty of travelling to and through the South Watut area, and because of the lack of shared ethnolinguistic identity in Middle Watut, it would be most feasible to start a project in North Watut and see what interest this generates in the other two communities for similar development. If a project was started in Middle Watut, the Bencheng variety may serve as linguistic middle ground among the other varieties. A project begun in either North Watut or Middle Watut would bridge more easily to the other than to South Watut (unless Maralangko and Zinimb are in fact a bridge; we do not have the data to evaluate this possibility).

Appendix A An explanation of all locations

Table 16. Villages, hamlets, and other locations

Government Name	Local Name	Hamlets	Other Notes
13 Villages of South Watut, Middle Watut and North Watut			
Sanang			According to locals Sanang is up in the mountains above Dangal (to the west or southwest), rather than upriver as shown by the government census point. It is supposed to be a hard day's travel from Dangal to Sanang.
Dangal[a]		*Mumas, Bukandu*	
Gumots	Bulaprik	*Bubuparum*	Gumots is reported by locals to be an area, rather than a village. We believe the village called Bulaprik is the primary village in the area.
Wawas			
Zinimb			
Maralangko			
Babuaf		*Madzim*, Wonkinch, Wori, *Kapungung/ Singono*	In Madzim they called Singono 'Kapungung', while in that hamlet they called themselves Singono.
Marauna		*Manamin, Makerin, Kachek, Marasap, Gamen, Tais*	Maralina
Bencheng			
Dungutung	*Wampan*		
Morom		*Onom*	Most of the population has moved to Onom; there are 23 houses in Onom, and approx. 12 in Morom
Uruf	*Waroh*	Ngazi	In Uruf we were told Ngazi was a hamlet of the village. Other information was contradictory.
Mafanazo		Unangg	We were told there were three houses in Unangg.
Other Locations			
Chiats			On the Watut River between the North Watut language area and the Markham River.
Maus Watut			On the Watut River between the North Watut language area and the Markham River.
40-Mile			On the Highlands Highway 40 miles west of Lae. Within a few kilometres east of Chivasing. Boat transport from the Watut River enters the Markham, proceeding downriver and docking about 10 minutes' drive directly south of 40-Mile. The turn to this road is the first left if leaving the gas station at 40-Mile and traveling west.

Dambi			East across the Watut River from the South Watut area.
Gawapu			East across the Watut River from the South Watut area.
Piu			East across the Watut River from the South Watut area.
Yanta			East across the Watut River from the South Watut area. This is the name of a ward, but was given by locals as the name of a location.
Biamena			East across the Watut River from the South Watut area.
Mumeng Line			This is how the Watut communities generally referred to the people groups on the east side of the river (excluding the Watut communities of Wawas and Babuaf).
Maziu No. 2			This is a government census point located near the one for Singono. It may be intended to represent Ngazi or Madzim. We are uncertain.

[a] Italicized names indicate locations visited. Note that work was not completed in all locations visited. See table 9. Villages visited and work completed.

Table 17. Alternate village names used in past research

	2000 Census	Alternates
Watut Villages	Dangal	Danggal (Holzknecht), Daŋgal (Fischer)
	Wawas	Wowas (Landweer & Reitmaier), Wowos (Fischer)
	Gumots	Komos (Hooley), Kumots (Fischer), Kumwats (Holzknecht)
	Zinimb	Zinimp (Hooley), Dzenemp (Holzknecht), Dzenemp (Fischer)
	Maralangko	Maralango (Hooley, Ross, Landweer & Reitmaier), Maralaŋko (Fischer)
	Babuaf	Babwaf (Holzknecht), Bubwaf (Hooley), Madzim (Landweer & Reitmaier), Madʒim (Landweer
	Marauna	Maralina (Hooley), Mararena (Holzknecht, Fischer, Landweer & Reitmaier)
	Bencheng	Bentseng (Holzknecht, Landweer & Reitmaier), Tsiletsile (Holzknecht), Silisili (Hooley, Ross), Bentseŋ (Fischer)
	Dungutung	Dunguntung (Hooley, Holzknecht), Wampan (Holzknecht, Fischer, Landweer & Reitmaier)
	Morom	Morum (Fischer)
	Uruf	Wuruf (Landweer & Reitmaier)
	Mafanazo	Mafanajo (Hooley), Mafanadzo (Landweer & Reitmaier), Mahanadzo (Holzknecht), Pesen (Fischer)
Other	Chivasing	Chefasing (Hooley), Chivaseng (Landweer & Reitmaier), Dzifasin (Holzknecht)

Appendix B Detailed description of wordlist methodology

Although major methodological considerations are described in section 8.1, a more detailed description of the methodology is given here. This would be particularly useful for a researcher trying to reproduce our analysis, or to understand how our percentages may have been derived differently from the percentages of similar analyses in other studies.

B.1 Adjustments to transcriptions

Prior to grouping apparent cognates, we chose to remove any glottal stops occurring word-initially or word-finally in our transcriptions. This is because individual surveyors were inconsistent in observing and recording glottal stops, noting them only when they stood out. Review of audio recordings also suggests to us that glottal stops which did not stand out during the initial elicitation became apparent during the repetition we asked for upon recording. These inconsistencies led us to believe that the presence or absence of a glottal stop in these positions in a transcription was dubious, and we felt most confident about a comparison which disregarded this phone in all positions except word-medial.

Additionally, some team members transcribed a front, open, unrounded vowel as [a] and others as [ɑ].[59] Upon discussion after fieldwork had been completed, those who used the latter symbol said they did so because of their own handwriting style but had meant to record the phone [a]. Thus, we adjusted all occurrences of [ɑ] to [a] prior to analysis.

B.2 Categorising corresponding vowels

Grouping apparent cognates according to Blair's methodology involves classifying corresponding vowels according to their phonological similarity. Corresponding vowels that differ by one phonological feature are considered Category One, and vowels that differ by two or more features are considered Category Two (Blair 1990:31). We tailored this methodology to suit our data sets by defining which vowels we consider to differ by one phonological feature.

Our methodology is illustrated in figure 7. First, vowels within a circle are considered to have no significant difference for the analysis (they likely differ only because of transcription inconsistencies). Only one vowel in each circle is part of the phonology described by Holzknecht (see section 2.5), except for the central cluster of [ə] and [ɜ], neither of which is listed in Holzknecht's phonologies. Thus, vowels within the same circle are considered Category One. Second, circles joined directly by a solid line contain vowels that are considered to correspond in Category One. Circles joined indirectly or by a dotted line are considered to correspond in Category Two. Thus, [æ] corresponding to [ɜ] is a Category One correspondence, whereas [æ] corresponding to [ʊ] is a Category Two correspondence.

[59]We only came across one low vowel, and for consistency, we chose the symbol [a]. Personal communication with other linguists in Papua New Guinea has suggested that others have used the [ɑ] symbol to represent the same phoneme.

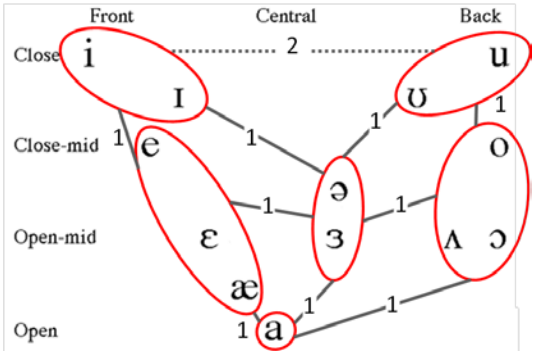

Figure 7. Vowel correspondences.

In addition to this, we considered the diphthongs [a͡u] and [u͡a] to correspond in Category One with [u], [o], [au], or [ua] to allow for transcription inconsistencies.

B.3 Secondary articulation

We chose to disregard secondary articulation while grouping apparent cognates. This includes articulation such as nasalisation on vowels, dentalisation and aspiration. We felt that these kinds of articulation may not have been consistently noted by all four surveyors and did not want to group terms separately on account of such slight differences without having more confidence in consistent recording. Note that aspiration was disregarded whether it was recorded as [h] or [ʰ].

B.4 Regular sound correspondences

While grouping apparent cognates using Blair's methodology, we considered [l], [r] and [ɾ] to be Category One[60] when they occurred in corresponding positions. During our fieldwork, we observed that these phones occurred in apparent free variation. Our observation is supported by Holzknecht, who concludes that free variation occurs between [l] and [r] (Holzknecht 1989:54–55). We also considered [w] corresponding to [u], and [i] corresponding to [j] Category One when they occurred between consonants or non-identical vowels. In these environments, these sounds are essentially indistinguishable and may have been transcribed differently by different recorders.

In all three Watut languages, we noted what we believe is a separate morpheme prefixed to the main verb root on many verbs. Although it does not appear in all instances, it occurs more than three times in the data set for each variety. There are variations to this suspected morpheme. For example, in Onom and Uruf there is alternation between [di] and [de]. In Mafanazo, there is alternation between [di] and [dɛ]. However, there are at least three instances across our data sets where the prefixes noted in table 18 occur (see items 61, 63, 69, 70, 71 and 75).

[60] Phones in corresponding positions are classified as Category One, Category Two or Category Three based on phonetic similarity and regularity of correspondence. Category One is reserved for phones that are identical, very similar, or occurring in apparently regular correspondence (Blair 1990:31).

Table 18. Verb prefixes

Dangal	Bubuparum	Wawas	Madzim	Marauna	Bencheng	Wagongg	Boral	Onom	Uruf	Mafanazo
i-		i-	li-	li-	ɾi-	di-	li-	di-	di-	di-

The Marauna variety often has a repeated [i] phone as part of this prefix, recorded as [li-i] in our data.[61] Marauna is grouped with the understanding that the repeated [i] occurs more than three times in the data, and is thus counted as a Category One insertion (cf. item 58 'he sees').

As seen in table 18, Bubuparum does not have a prefix corresponding to that seen in the other varieties. Either the informant in Bubuparum produced verb roots without the morpheme or the morpheme is null in this variety.

Because of the regularity with which this set of prefixes occurs across the data sets, it was ignored while grouping apparent cognates. One special case of this is item 66 'dies', depicted in figure 8. In this instance, the terms from Dangal and Wawas begin with [mi-] unlike the [i-] and [li-] used respectively elsewhere in those varieties' data sets. It could be argued that what we suspect are prefixes on all terms for item 66 are actually part of the verb root. However, apparent prefixes in the other items are what we'd expect them to be as prefixes, so we chose to ignore them in the comparison. The parts compared are listed in the Notes column of figure 8.

Variety	'he dies'	Grouping	Notes
Dangal	mi-mal	a	mal
Bubuparum	mal	a	mal
Wawas	mira-surimar	b	ra-surimar
Madzim	ɾemar	a	mar
Marauna	lemal-ʤəmpeŋ	c	mal-ʤa͡umpeŋ
Bencheng	ɾemær	a	mær
Dungutung (Wagongg)	demal	a	mal
Dungutung (Boral)	lɛmar-fono	d	mar-fono
Onom	dimar-hunu	d	mar-hunu
Uruf	timor-ʤupɪn	c	mor-ʤupɪn
Mafanazo	dɪmar	a	mar

Figure 8. Grouping for item 66 'he dies'.

There is a regular correspondence particular to the Madzim variety. The prefix [li-] is added to many adjectives where no prefix is seen in the other varieties. Because it occurs more than three times in the data set (consider items 76, 77, 79, 80, 81, 90, 91), it is ignored in the comparisons. Interestingly, Holzknecht says, "The languages of the Watut group have very few words in the class of 'true' adjectives. Most of the attributives are stative verbs..." (1989:126). Thus, this prefix may be the same as the one noted in connection with verbs in our data sets.

The Madzim and Wagongg varieties appear to have an [-m] suffixed to the root of many inalienable terms (consider items 2–6, 8, 11, 12, 13–16, 18, 38). In addition, on many of these inalienable terms, a vowel seems to be prefixed to the root in the Madzim variety. This is usually [o-] but sometimes [u-] (cf.

[61]Again there is some variation in the exact form of the final vowel (cf. item 51 'he stands'); we suspect vowel harmony may be occurring but the analysis necessary to draw a conclusion is outside the scope of this study.

item 17). This suffix and prefix appear to correspond to an inalienable possessive pronoun affix listed by Holzknecht for Middle Watut (1989:106). The affix has been disregarded in the grouping of apparent cognates.

Finally, the Wagongg variety often has an [h] corresponding to [f] in other varieties. This correspondence is seen at least three times across the data sets (cf. items 19, 32, 37 and 57). It is therefore considered a regular sound correspondence, and the Wagongg variety was never grouped separately on the basis of this correspondence alone.

B.5 Analysing doublets

When analysing doublets, we used different strategies based on two different situations. When a variety had exactly the same term for two items, we always excluded one of the two from that variety's comparison. More often, however, the doublets appeared to involve two roots joined together, one being novel and one being a doublet with the term for another item. As an example of this, for item 98 'smoke' (presented in figure 5, section 8.1), five varieties incorporate the term for 'fire' in their term for 'smoke'. In cases such as this, we considered whether stripping off the doublet portion of the term in question (e.g., 'fire' from 'smoke') would leave us with an apparently meaningful root comparable across the varieties. If we thought we could, we did so, rather than excluding the entire term from the comparison. If we had doubts about the isolation of a comparable root, however, we did exclude the entire term that had a doublet component. Table 19 presents items excluded either because they were exact doublets or because we could not isolate an apparently comparable root by stripping off a doublet portion. Table 20 presents items included after stripping off a doublet portion to leave an apparently comparable root.There are also cases where we deliberated whether or not two terms constituted a doublet and decided they did not. These terms, which were included in the analysis, are presented in table 21.

Table 19. Exclusions: Exact doublets or doublets with nonisolable morphemes

Items Excluded	**Varieties**	**Doublet With Item(s)…**
2 'hair'	All	1 'head'
9 'knee'	Wagongg, Onom, Uruf, Mafanazo	22 'leg'
15 'foot'	All	22 'leg'
20 'elbow'	All	9 'knee', 14 'hand'
23 'heart'	Dangal, Bubuparum, Bencheng	24 'liver'
28 'girl'	All	32 'woman', 77 'small'
29 'boy'	all but Mafanazo	33 'man', 77 'small'
30 'old woman'	All	32 'woman', 87 'old'
31 'old man'	All	33 'man', 87 'old'
37 'sister'	All	32 'woman', 36 'brother', 76 'big'
49 'person'	All	33 'man'[a]
55 'bites'	All	56 'eats'
65 'kills'	All	64 'hits', 66 'dies'
84 'cold'	Marauna	89 'wet'
109 'stick'	all but Uruf	14 'hand', 77 'small', 108 'tree'
110 'bark'	All	8 'skin', 108 'tree'
111 'seed'	all but Wawas	5 'eye', 108 'tree'
118 'feather'	All	2 'hair', 39 'bird'
121 'claw'	Madzim	21 'thumb'
125 'three'	All	123 'one', 124 'two', no vernacular term

126 ‘four’	All	124 ‘two’, no vernacular term
127 ‘five’	All	14 ‘hand’, 123 ‘one’, 124 ‘two’, 152 ‘all’, no vernacular term
128 ‘ten’	All	14 ‘hand’, 124 ‘two’, 126 ‘four’, 127 ‘five’, no vernacular term
142 ‘afternoon’	all but Dangal, Bubuparum, Wawas	141 ‘morning’, 143 ‘night’
145 ‘tomorrow’	all but Dangal, Bubuparum, Wawas	141 ‘morning’
150 ‘green’	Bubuparum	146 ‘white’
154 ‘that’	Madzim	153 ‘this’
156 ‘who’	Bubuparum	155 ‘what’
157 ‘when’	Marauna, Mafanazo	155 ‘what’
164 ‘he’	Dangal	49 ‘man’
165 ‘we two’	All	124 ‘two’
166 ‘you two’	All	124 ‘two’
167‘they two’	All	124 ‘two’, 164 ‘he’, 170 ‘they’

[a] The similarities between items 49 and 33 across varieties were so great we felt we could not include both in the comparison. Terms for both items involve a segment [ŋa], which also is incorporated in some pronouns. We suspect this segment is a separate morpheme, but could never clearly develop a case for this. At any rate, the segment is used in all varieties. Therefore, when we decided to include item 33 instead of item 49, we grouped Boral, Bencheng and Madzim as if they had this [ŋa] segment on their terms for 33, even though it is actually present only for item 49 in these varieties. (It so happens that the groupings for item 33 stay the same regardless of whether or not we ignore the [ŋa] segment.)

Table 20. Inclusions: Comparable root after stripping off doublet portion

Items	**Varieties**	**Removed portion that’s doubled with items…**
1 ‘head’	Wagongg, Onom, Uruf, Mafanazo	25 ‘bone’
4 ‘nose’	Wagongg, Onom, Uruf, Mafanazo	25 ‘bone’
5 ‘eye’	Dangal, Bubuparum, Wawas / Wagongg, Uruf	106 ‘water’ / 111 ‘seed’
8 ‘skin’	Wawas, Madzim, Wagongg, Uruf, Mafanazo	110 ‘bark’
10 ‘ear’	Onom	113 'leaf'
16 ‘back’	Onom, Uruf, Mafanazo	25 'bone'
21 ‘thumb’	All	14 ‘hand’
32 ‘woman’	Marauna	33 ‘man’
36 ‘brother’	Dangal, Bubuparum, Wawas, Bencheng, Boral	76 ‘big’
57 ‘gives’	All	162 ‘I’
63 ‘drinks’	Wawas	106 ‘water’
67 ‘burns’	All	97 ‘fire’
69 ‘swims’	Dangal, Bubuparum, Wawas	106 ‘water’[a]
98 ‘smoke’	Bubuparum, Dangal, Onom, Mafanazo, Uruf	97 ‘fire’
99 ‘ashes’	Bubuparum, Dangal, Wawas, Onom, Mafanazo, Uruf	97 ‘fire’
112 ‘root’	All	108 ‘tree’
113 ‘leaf’	Madzim, Bencheng, Mafanazo	108 ‘tree’
121‘claw’	all but Madzim & Marauna	14 ‘hand’ or 22 ‘leg’
152 ‘all’	Bubuparum, Wawas	76 ‘big’

168 ‘we plural excl’	Boral	152 ‘all’
169 ‘you pl’	Bubuparum	76 ‘big’

[a] Also ignored the [a], presumably a preposition, which precedes the root for ‘water’.

Table 21. Inclusions: Suspected doublets

Items	Varieties	Rationale
3 ‘mouth’, 11 ‘tongue’	Madzim	These items differ by only one phone, but we believe they are separate words. Neither was excluded.
9 ‘knee’	Dangal, Wawas	Clearly a doublet only with item 20 ‘elbow’, which has been excluded for all varieties. Deemed not close enough to item 22 ‘leg’ to exclude.
61 ‘hears’	Madzim, Bencheng	Suspected doublet with item 58 ‘sees’ but decided the root of ‘see’ is [li], and ‘hear’ terms are much longer and include a nasal stop.
84 ‘cold’, 89 ‘wet’, 106 ‘water’	All	Couldn’t be sure whether roots were repeated or not because there were no regular patterns of repetition that held across varieties.
76 ‘big’, 38 ‘name’	Uruf, Wagongg, Marauna, Boral, Bencheng, Madzim	These items are similar or identical in many of the varieties, but we consider this a coincidence.
34 ‘father’,’ 35 ‘mother’	Dangal, Bubuparum	A segment [aŋg] is shared with other items in these varieties, but we do not feel the similarities are close enough to warrant excluding any on that basis alone.
107 ‘vine’	Boral	Queried whether this item is a doublet with 108 ‘tree’, but decided the two are not close enough to draw that conclusion.
133 ‘sweet potato’, 129 ‘taro’	Wawas, Onom, Uruf, Mafanazo	There may be shared roots among these items, but we don’t have enough evidence to be sure.
143 ‘night’	Dangal, Bubuparum, Wawas	Suspected a doublet with item 101 ‘moon’, but decided there’s not enough evidence.
152 ‘all’	Onom, Wagongg, Boral, Bencheng	Looked like a doublet with item 122 ‘tail’ but we suspect this is just coincidence.
156 ‘who’, 164 ‘he’, 168 ‘we plural excl’, 170 ‘they pl’	all	The terms for these items in many or all varieties begin with the segment [ŋa], which may be a morpheme shared with other terms such as 33 ‘man’. We don’t have enough evidence to conclude this, though.
157 ‘when’, 158 ‘where’	Wawas, Wagongg, Marauna, Boral, Bencheng	There are many similarities between these items in these varieties, but we do not have sufficient evidence to conclude they are doublets.
169 ‘you pl’, 168 ‘we plural excl’	Wawas, Madzim, Marauna	Queried whether these terms are doublets but decided there’s not enough evidence to draw that conclusion.

B.6 Incomparable terms

In some cases, we excluded items from the comparison because we had reason to suspect we did not elicit comparable terms across all varieties. Sometimes, informants expressed confusion regarding what term we were trying to elicit. Other times, cross-comparison of items suggested that apparently cognate terms existed in all varieties, but some informants had given synonyms that were not apparently cognate. Finally, we sometimes learned that there was no vernacular term with equivalent meaning to the one we were trying to elicit. Exclusions made for these reasons are presented in table 22, and include all varieties unless stated otherwise.

Table 22, Exclusions: Suspected incomparable terms

Items	**Rationale**
27 'baby'	Some terms are doublets with items 77 'small', 29 'boy' or 33 'man.' During elicitation, our impression was that the English or Tok Pisin words for 'baby' don't have exact equivalents in the Watut languages.
40 'dog'	Marauna's term is not apparently cognate with the terms from the other varieties, but an apparent cognate [kiom] was elicited in item 55, a sentence. Only Marauna was excluded from this comparison.
44 'flying fox'	In Wagongg and Onom, we were given the term for two or three types of flying fox. One of these types was apparently cognate across all the lists, except for in Dangal, where only one of the other types was given. Dangal's term was excluded.
46 'frog'	The Madzim term is apparently a Tok Pisin term for frog, and the informant had expressed hesitancy regarding this item. Madzim's term was excluded.
52 'lies down'	In one variety, the term looks similar to the term for 'eye'. In two other varieties, there's an apparent doublet with 'back'. The term elicited may have been a literal translation of the Tok Pisin elicitation prompt *stretim baksait* (straighten the back). In another two varieties, the terms are clear doublets with 53 'sleep'. These do not seem to be terms with comparable roots.
53 'sleeps'	Four varieties appear to incorporate the word for eye, and two are doublets with the previous item 52 'lies down'. There is great variety in length and composition of these items. The terms that seem to incorporate 'eye' may be direct translations of the Tok Pisin prompt *pasim ai na slip* (close eyes and sleep), whereas others may be a single verb meaning 'sleep' or 'lie' (Tok Pisin does not have an exact equivalent for 'sleep').
54 'walks'	Within each variety, we compared the term for this item with the term for 'go' in sentences. In some varieties, the two are identical or very close, and in others, they are completely different.
62 'knows'	During elicitation, informants often hesitated at length trying to think of a vernacular equivalent to the Tok Pisin *save* (know). Informants for two varieties said there is no vernacular term.
72 'catches'	For this item, we often had to explain in multiple ways what we were trying to elicit. Some terms seem to have two parts, perhaps one meaning *kisim* (get) and one *holim* (hold). We weren't sure which parts were comparable.
161 'not'	In some cases a full sentence was given for this item; in all cases there was confusion over what we were trying to elicit.

B.7 Synonyms

When synonyms or alternate terms were elicited, they were included and grouped individually in the comparison. The exception to this is when a synonym was a doublet with another item; in this case, the synonym was not included in the comparison. For each variety listed in table 23, two synonyms were given for the item specified.

Table 23. Inclusions: Synonyms

Items	**Varieties**
24 ‘liver’	Uruf
80 ‘long’	Onom
81 ‘short’	Onom, Madzim
91 ‘full’	Boral
102 ‘star’	Wagongg
114 ‘meat’	Bencheng
137 ‘arrow (spear)’	Boral, Mafanazo
150 ‘green’	Onom
156 ‘who’	Wawas[a]
159 ‘yes’	Dangal
170 ‘they pl’	Onom

[a] One synonym is identical to item 156 ‘who,’ and only the non-identical term was included in the analysis for this item.

B.8 Departures from Blair’s Methodology

As described in section 8.1, there are instances when we didn’t adhere to Blair’s methodology. These analytical decisions are described in table 24.

Table 24. Departures from Blair’s Methodology

Items	**Departures**
4 ‘nose’	In the Wagongg variety, the glottal stop was disregarded because it probably exists because of the ‘bone’ morpheme added. The same could be said for Uruf, but the argument could also be made that the [ʔ] in Uruf alternating with a [k] or [k^h] in other varieties occurs in 3 pairs in the data corpus (see items 1, 4 and 75). Thus, Uruf has been grouped twice to reflect the two alternate interpretations. Finally, [s] corresponding to [ʃ] was considered Category One because they are so similar.
32 ‘woman’, 33 ‘man’	Repetition in the Madzim variety was discounted (even though it occurs just twice in the data set—once for each of these items).
10 ‘ear’, 19 ‘chin’, 36 ‘brother’, 39 ‘bird’, 78 ‘good’, 91 ‘full’	Where a velar stop (in most cases, [g]) follows [ŋ], it is considered equivalent to [ŋ]. Examination of the data sets and listening to recordings suggests that inconsistencies may be due to having multiple surveyors eliciting wordlists.
40 ‘dog’	The initial phone [g] in the Wawas variety is considered a Category One correspondence with [k] because the difference could be due to transcription inconsistencies.

59 ‘comes’, 108 ‘tree’, 143 ‘night’, 159 ‘yes’, 162 ‘I’	For these items, some varieties have [j] preceding or following a vowel, or [i] preceding [j], where others do not. These differences may well be due to transcription inconsistencies, so the added [j]s or [i]s were disregarded during the comparison.
67 ‘burns’	Dangal should be grouped separately from Bubuparum and Wawas because it lacks a vowel preceding the nasal stop. However, transcription inconsistencies could be the reason a vowel was recorded sometimes and not others, and the three varieties were grouped together.
81 ‘short’, 132 ‘banana’	The phones [ts] and [tʃ] were considered to be a Category One correspondence, as they may differ because of transcription inconsistencies.
6 ‘neck’, 83 ‘light’, 100 ‘sun’, 116 ‘egg’	Intervocalic [w] was disregarded in the comparisons for these items as a possible transcription inconsistency.
107 ‘vine’	For varieties ending in vowels, we considered there to be a [ʔ] following the vowel that corresponded with a final [k] in Category Two.
112 ‘root’	Some varieties have a glottal stop, and this was disregarded in the comparison because it appeared to separate the roots of compound terms rather than being a part of the root.

B.9 Number of items compared between varieties

The apparent cognate percentage for a pair of varieties is derived by dividing the total number of apparent cognates by the total number of items compared for the two varieties. The total number of items compared for each pair of varieties is shown in table 25.

Table 25. Total items compared

Dang										
126	Bubu									
137	127	Wawa								
131	122	134	Madz							
133	123	136	132	Mara						
135	125	137	133	135	Benc					
135	125	138	134	136	138	Bora				
134	124	137	133	135	137	138	Wago			
134	124	137	133	135	137	138	138	Onom		
134	124	137	133	135	137	138	138	138	Uruf	
133	123	136	133	134	136	137	137	137	137	Mafa

B.10 Final notes

In Bubuparum, items 43–57 were mistakenly not elicited. Also, there were instances when informants indicated there is no vernacular term with meaning equivalent to that of the prompt given. Most of these are listed in table 19 and table 22, because they tended to occur for items which involved doublets or for which we suspected incomparable terms had been elicited. In addition to these, item 119 ‘horn’ had no vernacular term in Dangal, Bubuparum, Wawas, Madzim and Marauna.

Appendix C Wordlists

The following table contains wordlists for the 11 varieties compared in the lexicostatistical analysis.

Item	Dangal	Bubuparum	Wawas	Madzim	Marauna	Bencheng	Wagongg	Boral	Onom	Uruf	Mafanazo
1 head	ulu	uru	uɾu	ono	onõ	ono	ono oaro	ono	nukˀ waɾu	nuʔwaru	nu ɔɾu
2 hair	ulu fufu	uru fufu	uɾu fufu	onom fofo	onõ fofo	ono fɔfɔ	ono hoho	ŋano fofo	nuhuhu	nuhuhu	nu huøu
3 mouth	mua	mua	muɔ	omom	mõ	mɔ	mu	mu	mua	mwa	mɔa
4 nose	su	su	su	osom	sa͡u	sɔ	ʃoʔualo	so	sukˀ waɾu	suʔwaru	su ɔɾu
5 eye	malambu	marambu	maɾambu	maɾam	mara	mæɾæ	maranid͡ʒu	mara	mara	maned͡ʒo	maɾa
6 neck	ŋgut	ŋgut	ŋguts	ukom	kwo	ku	ud͡ʒampa	ku	wad͡ʒampa	ua	ɔwa
7 belly	lagifua	lagifua	lagifɔ	negimufo	lɛgiofo	legjɔfu	lagiʔoro	lagi koro	lageʔuɾu	lageuru	guaŋun
8 skin	tambit	tambitˀ	lini tsambits	lenem pepet͡s	pɛpəts	pepetʃ	nenempepet͡s	pɜpɜtʃ	abele	nini abəle	nɪnɪ abɛɾɛ
9 knee	fakuatun	fwatum	fakwatun	ogo goɾom	gogolo	gɔgɔrɔ	haga gogono	gogoro	haga nugun	haga nugun	haga nugun
10 ear	liŋandu	lɪŋandu	liŋandzu	leŋam	laŋgã	ɾeŋæ	leŋa	lɛŋa	liŋanaŋkut͡s	liŋga	ɾɪŋa
11 tongue	ŋgas	ŋgas	ŋgas	omam	mã	mæ	ma	ma	ma	ma	ma
12 tooth	d͡ʒandu	d͡ʒandu	d͡ʒandu	gontum	gont^{h}u	gɔntu	gantu	gantu	neho	nəho	nɛhɔ
13 breast	sus	sus	sus	sesom	səso	sɛsɔ	sesom	sɛso	sisu	sisu	sɪsu
14 hand	baŋgi	baŋge	baŋgiʔ	beŋkim	bɛŋki	bɛnki	baŋkim	baŋki	baŋke	baŋke	baŋke
15 foot	faga kitam	faga	fagapit͡sat͡s	fagam	faga petats	faga	hagam	faga pɛtats	haga pitat	haga pɪtat	haga pɪtat
16 back	balu	balu	baɾu	baɾom	balo	baɾɔ	balom	baro	baɾu uʌɾu	baru waru	baɾu ɔɾu
17 shoulder	dap	dapˀ	d͡ʒap	ud͡ʒop	d͡ʒopˀ	dʒip	d͡ʒip	dʒip	dzapunu	dzapunu	dʒa unu
18 forehead	damba	damba	damba	dampam	dãnpa	dampa	dampam	dampa	dampaleɾe	dampalele	dampa
19 chin	mu͡akumba	mokumba	muakumba	dagafat͡ʃ	dagaft͡s	dagafatʃ	daŋahat͡s	daŋafats	daŋahats	daŋgahats	daŋahatʃ
20 elbow	baŋgi kuatun	baŋgi kwatun	baŋgi kuatun	beŋkim kuaton	bɛŋki kwatõn	kɔŋɔkɛŋ	baŋki gogono	baŋki gogoro	baŋkenugun	baŋke ŋugun	baŋkɛ nugun
21 thumb	baŋgi nina	baŋgi lina	baŋgilina	beŋkim d͡ʒofef	bɛŋki lɛna	bɛŋkiɾɛnæ	paŋkim lena	baŋki lena	baŋkelina	baŋke lina	baŋkɛ ɾɪna
22 leg	faga	faga	faga	fagam	faga	faga	haga	faga	haga	haga	haga

Item	Dangal	Bubuparum	Wawas	Madzim	Marauna	Bencheng	Wagongg	Boral	Onom	Uruf	Mafanazo
23 heart	nua kutu	nua kutu	nua	moskutu	mos kutu	nuɸi	domonto	domonto	dumuntu	dumuntu	dumuntu
24 liver	nua	nua	nagifua	nuwom	ŋũwo	nuɸi	nuwi	nuwi	nuwʌ	nua	nɔ onɔ
25 bone	kandik	kandikˀ	kand͡ʒik	kuarok	kwarok^{h}	kwærok	oalo	kuaro	uaɾu	uaru	ɔɾu
26 blood	wat͡s	oat͡s	wek	wek^{h}	weɪk	wai	uai	wʌi	wai	ɔaɪ
27 baby	ŋintaru pamik	ŋintaru	ŋtarupamik	tains pemik	tains pemik	mæmɔl	pami	pami	matipame	matepame	matɛ taru
28 girl	kafi binam	kafi binam	kafibinam	kefi benam	kefi bɛnãm	kefi benæm	ahi taɾo	kafi bɛnam	aɾox binam	aro binam	aɾaf binan
29 boy	ŋauafak	nitaru	nintaɾu	tains maɾo	tains malo	tænji mæɾɔ	tains malo	tainʒ maro	mati tataru	mate talu	matɛ waha
30 old woman	kafi muŋ	kafi muŋ	kafimuŋg	kefi mes	kefi t͡ʃagat͡s	kefi tʃægætʃiŋ	ahi t͡ʃagat͡ʃ	kafi tsagats	aɾox t͡ʃagat͡ʃiaŋ	aro t͡ʃagat͡ʃian	aɾɔ tʃagatʃɪan
31 old man	ŋamuŋg	ŋamuŋ	ŋamuŋg	ŋamaɾo mes	ŋa t͡ʃagat͡s	æmæɾɔ tʃægætʃiŋ	ŋamalo t͡ʃagat͡ʃ	maro tsagats	ŋa t͡ʃagat͡ʃiaŋ	ŋa t͡ʃagat͡ʃian	ŋa tʃagatʃɪan
32 woman	kafi	kafi	kafi	kefikefi	ŋa kefi	kefi	ahi	kafi	aɾox	aroh	aɾɔ
33 man	ŋamaru	ŋamaru	ŋamaru	maɾomaɾo	ŋa maro	mæɾɔ	ŋamalo	maro	ŋamaɾu	ŋamaru	ŋamaɾu
34 father	lamaŋg	lamaŋ	lama	mama	mama	mæmæ	lama	mama	baba	baba	baba
35 mother	naŋg	naŋ	lina	nena	nena	nenæ	nena	nena	imoŋk^{h}	dudu	ɪmɔŋg
36 brother	lauaŋ fariŋ	lawaŋ fariŋ	laua fariŋg	lo woŋg	lowo	levi beŋæin	labim	laui biniŋiŋ	awaŋk^{h}	awaŋk^{h}	lawa
37 sister	lauaŋ kafi	lawaŋ kuwak	ni kafi fariŋg	lo woŋg	kɛfi mõŋgĩõŋ	næfɔ beŋæin	nahom	nafo biniŋiŋ	nahuŋk^{h}	nahu beŋgniaŋ	nahɔ bɛnɛŋɪaŋ
38 name	biŋa	kubiŋa	biŋga	beŋam	beŋgã	beŋæ	beŋam	bɛŋa	biŋa	biŋa	bɪŋa
39 bird	marŋk	maraŋ	maɾaŋ	maŋg	maŋk	mæŋ	maŋg	maŋkˀ	maŋk^{h}	maŋk^{h}	maŋk
40 dog	kiam	kiam	giam	kiom	nãn	kijim	ijim	kigim	ijam	ijam	ɪam
41 pig	mbuk	mbuk	mbuk	puk	puk^{h}	puk	pu	pu	mpo	pa͡u	mpɔ
42 cassowary	buakiŋ	bwakiŋ	bɔkin	bonɛŋg	bonɛ̃ŋk	bɔneŋ	bonɛŋg	bonɛŋkˀ	buniŋk^{h}	buniŋk^{h}	bunɪŋg
43 wallaby	malap		maɾap	poɾep	poɾɛp	poɾep	poɾep	poɾɛp	puɾip	puɾip^{h}	pulip
44 flying fox	saŋand		biamband	biampand	biampanṭ	biæmpænd	biampand	biampand	iampand	iampant	jampand
45 rat	muandaŋkˀ		muandaŋg	koful	mwãntãŋ	kɔfʊl	muantank	muantankˀ	muantaŋg	mwantaŋk^{h}	wantaŋgə
46 frog	kurik		kuɾik	loklok	kurik^{h}	gæræp	uɾik	kuri	oɾe	ore	ɔlɛgagai

Item	Dangal	Bubuparum	Wawas	Madzim	Marauna	Bencheng	Wagongg	Boral	Onom	Uruf	Mafanazo
47 snake	muar		muar	mor	mol	mʊr	mul	mur	muar	mwar	mɔar
48 fish	iaŋk		iaŋg	ioŋg	jogãmpõ	jiŋg	jiŋg	jiŋkˀ	d͡ʒaŋgampu	t͡ʃaŋgampu	dʒaŋg
49 person	ŋauaŋin		ŋawaŋin	ŋaramuku	nãla mũŋku	ŋæmærɔ	ŋamuluŋku	ŋamuruŋku	ŋamoɾoŋko	ireŋu	ŋamuŋkɔ
50 he sits	im bapsu		imbapusu	dogond	li dogond	dɔgɔnd	dogond	lɛ dogond	diduŋkunt	diduŋkunt^{h}	araŋk
51 he stands	indaŋk		indaŋ	entaŋg	li ãntãŋ	ɾentæŋg	dentaŋg	lɛ taŋkˀ	dintaŋg	dintaŋk^{h}	mɔnti
52 he lies down	lulu baru		igiŋg i͡tsak	igiŋg	li igɪŋ	ɾigiŋg	dempa pele͡ts	li giŋkˀ	dihere tolbaru	degeŋk^{h}	maradıta
53 he sleeps	i giŋk		igiŋg	lipotop	lamo kolu	lemɔk mæræŋkæ rigiŋg	digiŋg	lɛmo mara	degeŋ maramu	dimumala	dɛgɛŋkunu
54 he walks	i uandand		imundikia	liok^{h}	le wanand	ɾijik	uji	liʒi	dija	dija	dısıŋkan
55 he bites	kiam idʒal ŋa		kiam i͡dʒiarŋaŋar a	kiom legar ŋarum muŋku	kiom legar	kijim legær kærʊmuŋku	ijim degal ŋamuruŋku	kijim lɛgar ŋamuruŋku	ijam digar ŋamoloŋko	ijam digarŋamelow	dıgar
56 he eats	i gan		iganagan	legangan	legãŋgãn	legæn	degan lam	lɛgar	digaram gaiaŋ	diga	dıutıgi
57 he gives it to me	igin nafu dʒia		igina fu͡tsia	lifu͡tʃiu	lifu͡tʃ t͡ʃiu	lifʊtʃi	dihu͡tʃiji	lifuts tʒiʒi	dehot͡ʃia	dehot͡ʃia	dıɔ hɔgɔ
58 he sees	i uli	lawidi	ivirik	ɾiɾi	li ili	ɾiɾɪ	dili	lili	diwaɾe	diware	dawaı
59 he comes	i iaka	jaka	iaka	iaka	li jaka	ɾejækæ	dia?a	liapa	dia?a	dija?a	ıa
60 he says	i ŋis	lar	iŋis	eɾaɾagen	le lalagɛ̃n	leræregen	delalege	lɛ lalege	diɾaɾigi	dirarigi	uɾal ıgı
61 he hears	i ruŋu	luŋu	iruŋu	ɾiɾiŋu	li lɪŋu	ɾiɾɪŋʊ	diliŋu	li liŋu	dileŋo	dileŋo	di ɾɛŋɔ
62 he knows	ŋaulu dʒaf	ulu d͡ʒaf		ɾifiɾona	laŋop	nʊiɸɪɾifiɾɪ	nuihiɾi	nui lifiri	dihiɾaŋina	dihilaŋina	nua dı hɛɾɛ
63 he drinks	i num	num	inumambu	lenom	lenom	ɾenʊm	denom	lɛ nom	dinum	dinum	dınum
64 he hits	i git	gıt	igi͡ts	liwi͡ts	liwɪt͡ʃ	ɾitʃ	di͡tʃ	litʃ	dɛt͡ʃ	dɛt͡ʃ	dɛtʃ
65 he kills	i gitimal	gıtəmal	igi͡ts imar	litsɾemar	li͡ts lemal	ɾitʃ fɔnɔ	di͡tʃ hono	litʃ lɛmar	dɛt͡ʃ dimar	dɛt͡ʃ hunu	dɛtʃ hunu
66 he dies	mi mal	mal	miɾa suɾimaɾ	ɾemaɾ	lemal d͡ʒa͡umpeŋ	ɾemær	demal	lɛmar fono	dimar hunu	timor d͡ʒupın	dımaɾ
67 it burns	sumua kuarŋk	sumwa kwaraŋ	sumue ikuaraŋ	suŋoregan	suŋo lele	ʃɪŋʊɾereɾɔk	siŋu degan	tsiŋu lɛgan	iah diga	ja dililu	jatiɾiɾu

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68 it flies	i dufia	duf	id͡ʒufia	lid͡ʒuf	li id͡ʒuf	ɾedʒʊfik	did͡ʒu	lidʒuf iji	ded͡ʒoh ia	ded͡ʒoʔ ia	dɛd͡ʒɔhɪa
69 he swims	i suŋ gambu	suŋgambu	isuŋgambu	lisuŋg	li isuŋg	ɾisuŋ	disuŋ	lisuŋkˀ	desoŋg	desoŋkʰ	dɛsɔŋk
70 he runs	i ruond	lun	irund	lirund	li kilɪt	ɾirʊnd	dikirit	li kirit	deɾond	derond	dɛrɔnt
71 he falls down	i mu	mu	imu	libeɾo	li bɛlo	ɾebeɾɔ	debeɾo	lɛ bɛro	dibiɾu	dibiru	dibiɾu
72 he catches	ndum	gumər	ind͡ʒum	likafa	li t͡ʃapol	ɾetʃæpɔɾ	dint͡ʃum	lɛ tsapol	dent͡ʃom	dibari det͡ʃapur	dɛntʃɔmina
73 he coughs	i tuluŋ	bandu	ibumbum	litiruŋ	li tiluŋ	ɾitɪɾʊŋ	ditiɾuŋ	li tirum	diteɾon	diteron	dɪtɛron
74 he laughs	i sisik	kɔw	ikaur	lisisik	li sisik	ɾɪsɪsik	disisi	li sisi	diluaŋ	diluaŋ	dɪruaŋ
75 he dances	i kumbˀ	kumb	ikum	likumb	li ikumb	ɾɪkʊmb	diʔumb	li kumb	deʔomb	deʔompʰ	dɛʔɔmb
76 big	fariŋ	farəŋ	fariŋ	libeŋa	bɛ̃ŋã	bɛŋæ	beŋa	bɛŋa	ntah	biŋa	ndah
77 small	tatalu	tətaru	tataɾu	litaro	talo kwale	tærɔkwæɾɛŋ	taɾo	taro	taɾu	taru	taɾu
78 good	biniaŋ	bɪnjaŋ	biniaŋ	binoŋ	bi noŋ	bɪniŋ	bɪnɪŋ	biniŋ	beneŋ	beneŋg	bɛnɛŋ
79 bad	sus	sus	isus	lisaus	sa͡us	sæʊsɪŋ	desaus	sausijiŋ	maʔiʃiaŋ	maisiaŋ	maisjaŋ
80 ong	fadʒa	fad͡ʒa	fad͡ʒia	lionte	ɔnte	ɔntɛɾɛnæ	onteɾena	onte rɛna	unti	unti	untɪ
81 short	tupu	tupu	t͡ʃupu	leko͡ts	kot͡ʃ kale	kɔtskæɾɛŋ	o͡tsʔaɾe	kotskaɾɛ	ut͡ʃ	ut͡ʃ	uts
82 heavy	numala	numara	numaɾa	maɾage	malage	mæɾægɛ	malage	marage	baɾabin	balabin	baɾabin
83 light	buambuap	bwambwap	bambuap	buampap	bwampap	bʊwæmpæp	buampap	buam pap	buʌmpa	buwampa	buwampa
84 cold	manas	burum	mbuɾuŋg	manas	bopal	bɔpæɾ	poŋko	poŋko	nuh	nuh	nu
85 warm, hot	sasu	sasu	sasu	ɾeɾon	lelon	ɾɛɾɛɾɔn	deleron	lɛlon	liɾun	lilun	ɾiɾun
86 new	uafak	ufak	wafak	wafak	wafakʰ	wæfæk	uaha	uafa	uaha	waha	waha
87 old	muŋkˀ	mumuŋ	moŋg	moŋg	moŋ	mɔŋk	moŋgijiŋ	moŋkˀ gijin	muŋgiaŋ	muŋgiaŋ	muŋgjaŋ
88 round	tumtum	fad͡ʒa	tumutum	dogoɾom	dogolom	dɔgɔɾɔmb	dogolom	dogorom	dumund	dumund	dumund
89 wet	mburuŋkˀ	mburuŋ	imbuɾuŋ	bopar	bopal	lɛbɔpæɾ	depoŋko	bopar	buŋku	buŋku	buŋku
90 dry	siŋ	siŋ	isiŋ	lisiŋ	lisɪŋ	ɾisɪŋ	disɪŋ	lisiŋ	ohoho	hohoho	dɪhɔhɔhɔ
91 full	furuŋkˀ	furuŋ	ifuɾuŋ	lifuŋg	li fuŋ	ɾifʊŋg	dihuŋg	lifuŋkˀ	dehoŋg	dehoŋg	dɛpoŋ

Item	Dangal	Bubuparum	Wawas	Madzim	Marauna	Bencheng	Wagongg	Boral	Onom	Uruf	Mafanazo
92 road	muadu	mwad͡ʒu	muad͡zu	noŋko	mud͡ʒu	nʊŋkʊ	naŋku	naŋku	naŋko	naŋko	naŋkɔ
93 stone	batapˀ	batap	batap	loŋg	taf	tæf	tao	tauf	taoh	tao	tauʰ
94 earth	kumbun	kumbun	kitamb	etamb	eṭamb	ɛtæmb	etamb	etamb	itamb	itamb	ɪtampʰ
95 sand	mum	mum	mum	magamaŋg	măgamãŋ	mægæmæŋg	magamaŋ	magamaŋkˀ	magamaŋg	t͡ʃit͡ʃit͡ʃu	magamaŋg
96 mountain	sufanda	sufanda	sufanda	subuntu	ʃubuntu	sʊbʊntʊ	subuntu	subuntu	subonto	subonto	subuɔntɔʰ
97 fire	sumua	sumwa	sumuɔ	suŋo	suŋo	sɪŋʊ	siŋu	siŋu	iah	jah	jaʰ
98 smoke	sumua muaŋun	sumwa mwaŋun	mumɔŋun	saŋasoŋ	saŋa suŋ	sæŋæsoŋ	saŋasoŋ	saŋa soŋ	iahasuŋ	jah hasuŋ	jaʰ hasuŋ
99 ashes	sumua fini	sumwa fini	sumɔfini	fone	suŋo fone	fɔnɛ	hone	fone	iahuni	jah huni	jahunɪ
100 sun	suak	suwak	suak	suok	suwok	sʊwik	sui	suwi	suʌ	suwa	suwa
101 moon	bulambˀ	bulambˀ	bulamb	bɒramb	boramp	bɔɾæmb	bɒramb	boramb	buɾamb	buramp	buɾamp
102 star	uasiuasi	uasasi	ŋaɾimari͡ts	kose	kose	gɔsɛ	ose	kose	oasi	oasi	ɔasi
103 cloud	kauf	kauf	kauf	muf	neŋkon	mæɾænɛŋkɔn	maɾaʔabo	marakabof	maɾaʔabuh	marabuh	maɾaʔabu
104 rain	ŋamik	ŋamik	mikʰ	emik	əmik	ɛmik	ami	ami	me	me	mɛ
105 wind	muafifin	manas	mbasambas	fiŋ	pas	fɪŋ	hiŋ	pas	manas	manas	pas
106 water	mbu	mbu	mbu	po	po	pɔ	po	po	mpu	pu	ᵐpu
107 vine	uak	mban	uak	wok	wok toro	wik	wi	wi gampon	ua	ua	wa
108 tree	dʒia	d͡ʒa	d͡ʒia	ga	ga	ga	ga	ga	ga	ga	ga
109 stick	dʒia tatalu	d͡ʒa tupu	gabaŋgi	gabeŋki	ga meri	gabɛŋkɪ	gabaŋki	ga baŋki	gabaŋke	itu	ga uts
110 bark	dʒia tambit	d͡ʒa tambit	gat͡ʃambi͡ts	gapepe͡ts	ga pepə͡t͡ʃ	gapɛpɛt͡ʃ	gapepe͡t͡ʃ	ga pɛpɛt͡ʃ	gaʔabeɾe	gaʔ abere	ga abɛɾɛ
111 seed (for planting)	dʒia nidu	d͡ʒa nid͡ʒu	ganid͡ʒu	ganid͡ʒu	ga nid͡ʒu	ga nidʒʊ	ganid͡ʒu	ga nidʒu	ganed͡ʒo	ga ned͡ʒo	ga nɛdʒɔ
112 root	dʒia kakuat	d͡ʒa kakwats	gakakuat͡s	gakowut͡ʃ	ga kowo͡ts	gakɛwɪtʃ	gaʔawit͡ʃ	ga kauits	gaʔaguat͡ʃ	ga aguat͡ʃ	ga aguats
113 leaf	nu	nabanum	naŋgu͡ts	ganaŋkot͡ʃ	nãŋ ko͡ts	ganæŋkɔtʃ	naŋkot͡ʃ	naŋ kots	naŋkut͡ʃ	naŋkut͡ʃ	ga nankuts
114 meat	iankˀ	pasip	pasip	pasep	joŋg	pæsɛp	pase	jiŋkˀ	basi	d͡ʒaŋkʰ	pasɪ
115 fat	mualan	mwaran	muaran	muaɾan	mwaran	mɔɾæŋ	muaran	muaran	muaɾan	mwaran	mɔaɾan

Item	Dangal	Bubuparum	Wawas	Madzim	Marauna	Bencheng	Wagongg	Boral	Onom	Uruf	Mafanazo
116 egg	kuruit	kiriwit͡ʃ	kiriβit͡s	koɾowet͡ʃ	korowet͡ʃ	kɔɾɔgɛtʃ	ologet͡ʃ	koro gɛts	uɾugit͡ʃ	urugit͡ʃ	uɾugitʃ
117 louse	gul	gul	gur	gor	gol	gɔɾ	gol	gor	guɾ	gul	guɾ
118 feather	marŋkˀ nini fufu	maraŋ fufu	maɾaŋglinifufu	lenifofo	maŋg lenefofo	mæŋgɾɛnɛfɔfɔ	nenehoho	maŋkˀ lɛnɛ fofo	maŋgnuhuhu	maŋkʰninihuhu	maŋknuhuhu
119 horn						tʃɔŋ	t͡ʃoŋ	tsoŋ	t͡ʃuŋ	t͡ʃuŋ	ntʃuŋ
120 wing	bit	bɪt	bit͡s	fugut͡ʃ	fugut͡ʃ	bæɪtʃ	bait͡ʃ	baits	bait͡ʃ	bait͡ʃ	baitʃ
121 claw	faga diŋarkˀ	bagi d͡ʒinak	fagad͡zinak	d͡ʒofef	d͡ʒofef	bɛŋkɪ dʒɔfɛf	baŋki d͡ʒohe	baŋki dʒofɛf	hagad͡ʒuhi	hagad͡ʒuhi	baŋka dʒuhɪ
122 tail	gut	gut	gut͡s	got͡ʃ	got͡ʃ	gɔtʃ	got͡ʃ	gots	gut͡ʃ	gut͡ʃ	gutʃ
123 one	taka naŋkˀ	takanaŋ	takanaŋg	moɾot͡ʃ	molot͡ʃ	mɔɾɔtʃ	beʔet͡ʃ	morots	biʔit͡ʃ	biʔit͡ʃ	pɪʔitʃ
124 two	suruk	suruk	suɾuk	seɾok	selok	sɛɾɔk	seɾo	sɛro	siɾu	silu	siru
125 three	suruk kauaŋin	suruk kwaŋin	suɾukawaŋin	seɾokamorot͡ʃ		sɛɾɔk æ mɔɾɔtʃ	seɾoʔa beʔet͡ʃ	sɛro a morots	siluʔabiʔit͡ʃ		siɾu a pitʃ
126 four	suruk a suruk		suɾukasuɾuk	seɾokaseɾok		sɛɾɔk æ sɛɾɔk	seɾoʔaseɾo	sɛro a sɛro	siluasilu		siɾu a siɾu
127 five	suruk a suruk takanaŋk		suɾukasuɾuk takanaŋg	seɾokaseɾoka morot͡ʃ		sɛɾɔkæsɛɾɔkæ mɔɾɔtʃ	seɾoʔaseɾoʔabeʔet͡ʃ	sɛro a sɛro a morots	baŋke hait͡ʃi		baŋka haitʃɪ a pitʃ
128 ten	baŋgit suruk					bɛŋki sɛɾɔk		sɛro a sɛro a sɛro a sɛro a sɛro	baŋkehaitʃi baŋkehaitʃi		baŋka haitʃɪ baŋka haitʃɪ
129 taro	baiamgˀ	baiamŋ	baiamaŋg	of	af	of	o	of	uaɾut͡ʃ	waɾut͡ʃ	ɔaɾutʃ
130 sugarcane	ŋusiaŋ	ŋusiaŋ	ŋusiaŋ	luf	luf	ɾuf	lu	luf	ɾoh	loh	lɔh
131 yam	ŋamis	dakuf	mis	nen	nɛn	nɛn	nen	nɛn	nin	nin	nɪn
132 banana	mamand	mamand	mamand	t͡ʃok	t͡ʃok	tʃɔk	t͡ʃo	tso	mamant	mamant	mamand
133 sweet potato	samaŋkˀ	samaŋ	samaŋg	uat͡ʃap	wat͡sap	wætʃæp	waʔeŋg	uakɛŋg	uaʔɛŋk	waɛŋkʰ	waʔink
134 bean	kapik	was waran	uasmitim	kepik	kepik	kɛpɪk	api	kapi	ape	apʰe	apɛ
135 axe	tandun	tandum	tsandzun	t͡ʃant͡ʃon	t͡sant͡so	tʃæntʃʊn	t͡ʃant͡ʃun	tsantsun	d͡ʒant͡ʃon	ed͡ʒant͡ʃoŋ	dʒantʃɔŋ
136 knife	buiaŋkˀ	paip	paip	pep	pep	pæɪp	pajip	paip	paip	paip	paɪp
137 arrow (spear)	laŋkˀ	laŋk	laŋg	sekan	sagaf	sɛkæn	laŋg	sɛkan	lamaŋkam	lamaŋkam	lamaŋkam

Item	Dangal	Bubuparum	Wawas	Madzim	Marauna	Bencheng	Wagongg	Boral	Onom	Uruf	Mafanazo
138 net bag	dindam	dindam	lind͡ʒam	tekip	tekip	tɛkɪp	taip	takip	haiʌ	haija	haija
139 house	uadu	wadu	uad͡ʒu	wid͡ʒu	wid͡ʒu	wɔdʒʊ	wud͡ʒu	wudʒu	uad͡ʒo	wad͡ʒo	wadʒɔ
140 tobacco	dafum	dafun	dafum	boga	boga	bɔʊgæ	buga	buga	bugʌ	buga	buga
141 morning	fafanaru	fafanaru	fafanaru	fiafaknaro	fiafaknaro	bɔænænærɔ	buanabuana	bwana bwana	buʌnʌ buʌnʌ	bwana bwana	buɔna buɔna
142 afternoon	iuŋiuŋ	iuŋiuŋ	yuŋuyuŋ	iaŋnaro	jaŋ naro	jæŋnærɔ	jaŋnaro	jauŋ ŋaro	marajʌon	malaijon	marajɔŋ
143 night	bulufu	bulufu	burufum	iaom	jia͡uŋ	jæʊŋ	jaoŋ	jauŋ	jʌon	ijon	jɔŋ
144 yesterday	limi kaua	limikawa	limikavar	lumokeni	lumɛk	lomækɛɪk	magane	lo maiŋka	megenage	megenage	mɪganagɛ
145 tomorrow	fiafak	fifak	fiafak	fiafak	fiafak	boænæ	bwana	buana	bwana	bwana	buɔna
146 white	mbuas	mbwas	mbuas	pos	poːs	pus	pu	pus	umpua	mpua	umpwa
147 black	ŋguand	ŋguand	ŋguan͡ts	fosek	sisiju	fosɛk	hose	fosɛ	husi	husi	husɪ
148 yellow	daŋadaŋ	danadaŋ	d͡zaŋad͡zaŋ	maŋ	maŋ	mæŋ	maŋ	maŋ	maŋ	maŋ	maŋ
149 red	du	fum	fum	d͡ʒo	d͡ʒo	dʒo	d͡ʒo	dʒo	d͡ʒu	d͡ʒu	dʒu
150 green	dʒoadʒa	mbwas	liniparat͡s	d͡ʒuguaga	d͡ʒugwaga	dʒʊgægæ	nenepalat͡ʃ	lɛne parats	parat͡ʃ	d͡ʒuguaga	paratʃ
151 many	muatamu	gambi	kambi	fofoŋ	kampe	kæmpɛrɛnæ	amperena	kamperena	ampirina	ampirina	ampɛrinə
152 all	kambi	kambi fariŋ	kambifariŋ	wosif	wesɪf	gotʃɛtʃɛ	got͡ʃɪt͡ʃɪ	gotsetse	gut͡ʃit͡ʃi	babu hit͡ʃi	wasɪp
153 this	tini	tini	tini	koigik	t͡ʃafɛl	kærɛijæ	ija	ijani	ene	t͡ʃo ene	ɛnɛ
154 that	tua	tua	tuʌ	igik	bemak	ɛgo	ago	koɛgo	ago	mana	agɔ
155 what	ŋasa	ŋasai	kaiaŋʌsʌ	gant͡ʃera	gat͡ʃɛla	gæntʃɛræ	lamse	gan tsɛra	lamʃi	lamsi	ramsɪ
156 who	ŋa tua	ŋasai	ŋaŋasa	ŋaseranaigik	ŋasela	ŋæsɛræ	ŋase	ŋase	ŋasi	ŋasi	ŋasɪ
157 when	luena	mwaka luwena	luiana	nengant͡ʃera naigik	lugana	rugænæ	nain gana	nain gana	moŋkaramʃi	elonga	sua ramsɪ
158 where	biana	naisa	biana	nagana	nagana	nægænæ	nagana	naga	inaga	inaga	nagana
159 yes	a	awe	awe	io	owe	ijo	jo	io	ijo	ijo	ɪɔ
160 no	makˀ	mak	imak	emak	emak	ɛmæk	ema	ɛma	ima	ima	ɪma
161 not	makˀ	mak	ara	aŋe entaŋg ana	kaŋe	æŋɛŋtæŋænæ	oŋe entaŋgena	ɛma etse	oŋe intaŋgina	oŋe intaŋgina	taŋgɛŋɪma

Item	Dangal	Bubuparum	Wawas	Madzim	Marauna	Bencheng	Wagongg	Boral	Onom	Uruf	Mafanazo
162 I	dʒia	d͡ʒia	d͡ʒia	t͡sio	t͡ʃio	tʃigɪ	iji	tsiji	ija	ija	ɪa
163 you (sg.)	ku	ku	kugu	kugu	kugu	kugu	ugu	kugu	ogo	ogo	ɔgɔ
164 he	ŋauaŋin	tini tua	ŋatua	t͡ʃio	la͡u	læo	ago	ŋaɛgo	lao	ŋago	ŋapitʃ
165 we two (excl.)	gaŋa suruk	nina sukuk	aŋasuɾuk	aŋaseɾok	gaŋa selok	gæŋæsɛɾok	gaŋaselo	gaŋa sɛɾo	ŋaŋasiɾu	ŋaŋa silu	gaŋa sɪɾu
166 you two	aŋga suruk	aŋga suruk	maŋasuruk	maŋaseɾok	maŋa selok	æŋæsɛɾok	maŋaselo	maŋa sɛɾo	maŋasiɾu	maŋa silu	maŋa sɪɾu
167 they two	ŋa suruk kauain	suruk	ŋasuruk	ŋaseɾok	ges wesif	sɛɾokænæŋg	maŋaseɾo	ŋa ɛgo ɛgo	ŋasiɾu	ŋa silu	maŋa sɪɾu
168 we (pl. excl.)	kaga	kambi	kaga	kaga	kagel	kægɛɾ	ŋaga	kaga gotsetse	ŋaga	ŋaga	ŋaga
169 you (pl.)	kam	kam fariŋ	kagam	kagam	kagam	kægæm	magam	kagam	magam	magam	magam
170 they (pl.)	ŋalau	ŋogeda	ŋaɾau	ges	ges	jiotʃ	ges	gɛs	ŋaʔagoago	ŋa agoago	ŋagɔgɔ

Appendix D Tools used

D.1 Main questionnaire

Interviewer Data recorder Observer on Feb. 2012 in

1 ORIGIN AND SOCIOLINGUISTIC RELATIONSHIPS

1.1 Inap yupela stori long olsem wanem yupela kam na sindaun long dispela hap, ol tumbuna blo' yupela kam long wanem hap, na kain olsem. CIRCLE MAIN PLACE IF MANY ARE LISTED.

1.1.1 *Place(s) of origin*	1.1.2 *Other place names*
1.1.3 *People names*	1.1.4 *Language names*
1.1.5 *Population movement*	1.1.6 *Other key events*

1.1.7 *Mention of shared identity*

1.2 PM TOOL 1 – ETHNOLINGUISTIC GROUPINGS INSTRUCTIONS ON SEPARATE SHEET. NOTE VERNACULAR GIVEN **V** = _____

2 ACTUAL LANGUAGE USE

2.1 Wanem tok i nambawan tok ol liklik pikinini i save lainim?

→ ╬ IF ANOTHER LG 1ST ► **2.1.1 Bihain ol i save lainim tok ples bilong yupela o nogat?**

→ ╬ IF YES ► **2.1.1.1 Taim ol i save, ol i gat hamas krismas?**

2.2 Taim ol pikinini toktok, em i V stret o ol i save mikisim wantaim narapela tok ples? ╬ IF THEY MIX ► **2.2.1 Wanem ol tok ples?**

Tok ples	*Places where they say it's spoken*

2.3 Taim ol pikinini PROBE ol i save yusim wanem tok ples? AFTER 1ST MENTION ► **Ol i save yusim IST MENTION tasol o narapela tok tu?**

2.3.1 **toktok wantaim bubu o tumbuna** *Language(s)*
2.3.2 **toktok wantaim papa mama** *Language(s)*
2.3.3 **toktok wantaim brata na susa** *Language(s)*
2.3.4 **toktok wantaim ol pren** *Language(s)*
2.3.5 **i belhat o kros** *Language(s)*

2.4 Sapos ol pikinini mikisim tok ples bilong yupela wantaim ol arapela tok ples, yupela ting wanem?

2.5 Yupela laikim ol pikinini bilong yupela i save gut long wanem tok?

2.6 Taim ol pikinini bilong yupela bai kamap man na meri, ol bai yusim wanem tok?

→ **2.6.1 Yupela ting wanem long dispela?**

2.7 Taim papamama i toktok wantaim pikinini bilong ol, papamama i save yusim wanem tok ples?

2.8 Taim yupela PROBE ol pikinini bilong yupela yet, yupela save yusim wanem tok ples? AFTER 1ST MENTION ► **Ol i save yusim V tasol o ol i yusim narapela tok ples tu?**

2.8.1 **stori long** *Language(s)*
2.8.2 **singaut strong o krosim** *Language(s)*
2.8.3 **laik lainim ol long pasin planim kaukau, painim abus, wokim bilum, o kainkain samting long** *Language(s)* **narapela tok tu?**

2.9 Taim yupela PROBE yupela save yusim wanem tok ples? AFTER 1ST MENTION ► **Yupela save yusim 1ST MENTION tasol o**

2.9.1 **tok pait** *Language(s)*
2.9.2 **tok pilai** *Language(s)*
2.9.3 **wokim kaikai blo' femili** *Language(s)*
2.9.4 **sindaun na stori arere long paia** *Language(s)*
2.9.5 **planim ol samting** *Language(s)*
2.9.6 **wokim singsing** *Language(s)*

2.10 Yupela ting wanem taim ol manmeri kam sindaun long ples bilong yupela na ol i no yusim tok ples bilong yupela?
IF NO ANSWER, PUT 'NO ANSWER'

3 Social Relationship in the Area

3.1 **Ol tumbuna bilong yupela i gat sampela birua?**

→ 3.1.1 **Na nau yupela gat wanem kain sindaun wantaim ol dispela lain?**

3.2 **PM Tool 2 – Joint Activities**

❶ Hand a volunteer 14 cards of other villages. **Inap yu putim long graun ol dispela kad na taim yu putim kad long graun, inap yu ritim nem i stap long kad? ❷Inap yu wokim long graun wanpela sekel long dispela blupela string? ❸Wanem ol arapela komuniti yupela i save PROBE wantaim? Putim ol i go insait long sekel.**

Ask, then clear the circle and repeat for the other 4 activities	Babuaf	Bencheng	Chiats	Dangal	Dungutung	Gumots	Mafanazo	Maralangko	Marauna	Maziu	Morom	Singono	Uruf	Wawas	Zinimb				
3.2.1 **wokim tret o maket**																			
3.2.2 **wokim pasin bilong marit**																			
3.2.3 **bung lotu**																			
3.2.4 **wokim singsing o kainkain pasin tumbuna**																			
3.2.5 **wok bung**																			

Clear tool, then ask 3.2.6 **Yupela i gat hevi wantaim sampela arapela lain?**

3.3 **Ol pikinini bilong yupela i go long wanem PROBE?**

3.3.1 **elimentari skul**		3.3.2 **praimeri skul**		3.3.3 **sekandari skul**	
name	*place*	*name*	*place*	*Name*	*place*

4 Church Language Use

	2012	2030
liturgi	*TP?*	
singsing lotu		
prea		
autim tok		
tok save		
ritim tok bilong God		
bung bilong ol yut		
bung bilong ol meri		
Sande skul		

PM Tool 3 – Church Language Use

❶Hand cards to volunteer. **Inap yu putim long graun ol dispela kad na taim yu putim kad long graun, inap yu ritim nem i stap long kad? ❷Mi givim yu sampela yelopela plestik na sampela blupela. Nau yupela olgeta makim wanwan aktiviti insait long sios we yupela i save yusim V na putim yelopela plestik antap long kad bilong dispela aktiviti. Sapos yupela save yusim narapela tok long wanpela aktiviti, orait yupela putim blupela plestik antap long kad.❸**When finished, give them red chips **Orait, tingting long tiam bihain, long taim ol pikinini bilong yupela i kamap bikpela pinis. Nau em i 2012. Tingting long 2030 o kain olsem. Long dispela taim bihain, wanem ol sios aktiviti yupela laikim pikinini bilong yupela i yusim tok V stret? Yu ken makim aktiviti long dispela redpela plestik.**

5 Work & Travel

5.1 **Sampela kampani i stap long eria bilong yu olsem timba o maining?** ╬ IF YES COMPLETE TABLE IF NO GO TO 5.2 ►

	1st company	*2nd company*	*3rd company*	*4th company*
5.1.1 **Nem bilong dispela kampani?**				
5.1.2 **Dispela kampani mekim wanem kain wok?**				
5.1.3 **Hamas yupela save wok long kampani?**				
╬ IF # ► 5.1.4 **Inap yupela stori long taim yupela save yusim V long kampani?**				

5.2 **Sampela nupela bisnis i laik kam insait long eria bilong yupela?**

5.3 **Yupela i save go long PLACE?**	**Mumeng**	**Lae**	**Bulolo**
5.3.1 **Yupela i save go olsem wanem?**			
5.3.2 **Husat i save go?**			
5.3.3 **Long wanpela yia, hamas taim yupela save go na kam long PLACE?**	*IF PLANTI ASK ABOUT EACH MONTH.*		
5.3.4 **Yupela i go long PLACE bilong mekim wanem?**			

Consent Requested = Y / N Consent Given = Y / N

D.2 Participatory tool

Part 1

Say:**Mi laik wanpela o tupela man o meri helpim mipela. Inap yupela makim wanpela long raitim na narapela bilong helpim mi.**
Say: **Nem bilong ples bilong yupela hia em wanem?**
Observe: *Answer.*

Name given IS a government name

Do: *Give volunteer the name card.*
Say: **Inap yu kisim dispela nem kad na putim i go daun long graun?**
Observe*: Name card is placed on the ground.*

Name given is NOT a government name

Do: *Give volunteer blank name card and non-permanent marker.*
Say: **Inap yu raitim nem long kad? Yu ken putim dispela kad i go daun long graun.**
Observe: *Name written and card placed.*

Say: **Orait, na nem bilong tok ples bilong yupela hia em i wanem?**
Observe: *Answer.*
Do: *Give volunteer blank name card and non-permanent marker.*
Say: **Inap yu raitim nem long hia? Yu ken putim dispela kad i go daun long graun tu.**
Observe: *Name written and card placed on ground.*
Do: *Give volunteer the blue string.*
Say: **Inap yu kisim dispela string na wokim bikpela sekel long graun? Kad i gat nem bilong ples bilong yupela i ken go insait long dispela sekel, na kad i gat nem bilong tok ples bilong yupela i ken go antap long sekel, bilong makim sekel.**
Observe: *Volunteer makes blue circle, puts place card inside it and puts language card on it.*
Say: **Orait, mipela laik kisim save long narapela ples i gat wankain tok ples bilong yupela – tok ples _____?**
Observe: *Answer.*

Answer is 'NO'

Confirm: **Tok ples _____ em i bilong yupela tasol.**
Observe: *Agreement. [If they change their minds, thinking of another place where the language is spoken, go to opposite side]*
FINISHED WITH PART I OF TOOL

Answer is 'YES'

Say: **Na nem bilong dispela ples em i wanem?**
Do: *For every village named, ask volunteer to place card with name in the circle.*
Observe: *Nobody can think of another village.*
Say: **Long wokabaut bilong mipela i go long ol dispela ples.**
Do: *Place the remaining name cards on the ground while reading them aloud.*
Say: **Sampela bilong dispela lain i gat wankain tok ples bilong yupela, _____? Sapos i olsem, kisim nem kad na putim i go insait long blupela sekel. Na sapos nogat, larim ol i stap ausait.**
Observe: *Response that some go in or not.*
Confirm: **Orait, ol dispela ples i gat narapela tok ples.**
Observe: *Affirmative response.*
FINISHED WITH PART I OF TOOL

PM Principles

DELEGATE	don't do anything for the people that they can do for themselves.
SUMMARISE	at the end of each stage it's often helpful. At the end of the tool, it's essential.
WAIT	after you give directions or ask a question, leave space and do not fill it. If the people do not understand, this will eventually become apparent and you can reiterate. Rule of thumb: ask and then wait until THEY ask YOU to respond.
CLARIFY	if there are V discussions, don't be afraid to ask what was discussed before moving on.

Part 2

Say: **Rausim dispela string na kad i gat nem bilong tok ples bilong yupela na putim long sait. Yumi pinisim dispela. Nau larim kad i gat nem bilong ples bilong yupela i stap, tasol kisim olgeta arapela kad na holim long han bilong yu.**
Observe: *Person discards blue string and language name card, then picks up the other cards and holds them (except for the target village's card).*
Do: *Give green string to volunteer.*
Say: **Orait, kisim dispela string na wokim narapela sekel . Raunim dispela kad i stap long graun.**
Check: *Person makes green circle around their village name card.*
Say: **Putim olgeta kad ausait long sekel, long wanpela sait.**
Check: *Name cards put down.*
Say: **Nau, lukim olgeta kad i stap ausait dispela grinpela sekel. Tingim tok bilong ol manmeri i stap long ol dispela ples. Sapos wanpela ples i gat tok em i wankain olsem tok bilong yupela, kisim kad na putim insait long sekel. Ol i no tanim liklik. Em i tok bilong yupela stret.**
Observe: *Discussion and rearrangement of name cards.*
Do: *Give yellow string to volunteer.*
Say: **Orait, kisim dispela yelopela string na raunim grinpela sekel.**
Observe: *Yellow circle made and all remaining cards are outside the circle.*
Say: **Nau, lukim olgeta kad i stap ausait dispela yelopela sekel. Tingim tok bilong ol manmeri i stap long ol dispela ples. Sapos wanpela ples i gat tok em i klostu tok bilong yupela, ol i tanim tok bilong yupela liklik tasol yupela harim planti. Kisim kad na putim namel long yelopela sekel na gripela sekel.**
Observe: *Discussion and arrangement of cards.*
Say: **Nau lukim ol kad i stap insait dispela grinpela sekel. Yu tingim sampela mas i go namel, o ol i mas stap? Sapos yupela laik yu ken putim ol kad long narapela sekel.**
Observe: *Discussion and arrangement of cards.*
Do: *Give red string to volunteer.*

All INSIDE yellow

Say: **Olgeta ples i stap insait dispela yelopela sekel o dispela grinpela sekel, tasol mi laik yu kisim dispela retpela string na wokim narapela sekel raun dispela yelopela sekel.**
Observe: *person makes red circle*
Say: **Retpela sekel makim ol ples we yupela inap long harim liklik tok bilong ol manmeri. Dispela yelopela sekel makim ol ples we yupela harim planti tok bilong ol. Nau yupela ting sampela ples i stap insait yelopela sekel mas stap insait retpela sekel, o nogat? Yu ken putim insait long retpela sekel, o larim i stap insait long yelopela sekel.**
Observe: *Discussion and arrangement of cards.*

All INSIDE YELLOW:

FINISHED WITH TOOL

Some or all OUTSIDE yellow:

Say: **Orait, kisim retpela string na wokim narapela sekel raun dispela yelopela sekel.**
Observe: *red circle made and remaining cards outside.*
Say: **Nau, lukim olgeta kad i stap ausait dispela retpela sekel. Tingim tok bilong ol manmeri i stap long ol dispela ples. Sapos wanpela ples i gat tok yupela inap long harim liklik, kisim kad na putim insait long retpela sekel. Ol i save tanim tok bilong yupela, na yupela harim liklik tasol.**
Observe: *Discussion and arrangement of cards.*
Say: **Dispela retpela sekel makim ol ples we yupela harim liklik tok bilong ol manmeri. Dispela yelopela sekel makim ol ples we yupela harim planti tok bilong ol. Nau yupela ting sampela ples i stap insait insait yelopela sekel mas i stap insait long retpela sekel, o nogat? Yu ken senis na putim insait long retpela sekel, o larim.**
Observe: *Discussion and arrangement of cards.*

All are INSIDE red:

Say: **Nau, yupela inap harim liklik tok long olgeta ples i stap insait long retpela sekel. Sampela ples i stap insait long retpela sekel yupela no inap harim o nogat?**
Observe: *Answer*

Agree:

FINISHED WITH TOOL

Don't Agree:

Say: **yu inap kisim dispela kad na putim ausait retpela sekel**.
Observe: *Discussion and arrangement of cards.*
FINISHED WITH TOOL

Some OUTSIDE red:

Say: Nau lukim ol kad i stap ausait long retpela sekel. Yu no inap harim tok bilong ol? Sapos yupela inap long harim liklik, yu ken putim insait dispela retpela sekel, o larim.
Observe: discussion and arrangement of cards.
FINISHED WITH TOOL

D.3 Observation schedule for main questionnaire

MAIN QUESTIONNAIRE OBSERVATION SCHEDULE VILLAGE: OBSERVER: INTERVIEWER:

INTERPRETED	Y / N	IF YES, LANGUAGE?		START : AM/PM	STOP : AM/PM

GROUP DYNAMICS

# MEN @ START:		# MEN @ END:		# WOMEN @ START:		# WOMEN @ END:	
TALLY MEN WHO LEAVE		TOTAL:		TALLY WOMEN WHO LEAVE		TOTAL:	
TALLY MEN WHO COME		TOTAL:		TALLY WOMEN WHO COME		TOTAL:	

APPARENT ATTITUDE

ATMOSPHERE:	VERY FRIENDLY	FRIENDLY	FORMAL	HOSTILE/RESISTANT
Q #S WHICH SEEM TO OPEN UP GROUP				
Q #S WHICH SEEM TO CLOSE UP GROUP				

LANGUAGE USE

EVERYONE USING V FOR DISCUSSION: Y N		OTHER LGS USED: TOK PISIN /		
WHO INITIATES OTHER LG:	YNG / MID-AGE / OLD	M / W	LOCAL / OUTSIDER (L/O)	LEADERS (WHICH):
TOPIC DISCUSSED USING OTHER:				
WHO FOLLOWS OTHER	YNG / MID-AGE / OLD	M / W	L/O	LEADERS (WHICH):
WHO DOESN'T FOLLOW OTHER	YNG / MID-AGE / OLD	M / W	L/O	LEADERS (WHICH):
WHO INITIATES A RETURN TO V:	YNG / MID-AGE / OLD	M / W	L/O	LEADERS (WHICH):

1 ORIGIN AND SOCIOLINGUISTIC RELATIONSHIPS

1.1 *Who tells the story? Was there general agreement concerning the answers given?*
Did people seem familiar with these details?

Was the history given in positive or negative terms (were they proud)?

Was their movement a result of their own initiative or were they forced?

If forced, who were the forcers and what is the attitude toward them?

Are they happy with where they are now?

1.2 **PM TOOL 1 – ETHNOLINGUISTIC GROUPINGS**

Part 1 

Note: Who took leadership in this activity?

Was there a particular group directing the process?

Is there an opposition party; who is it

Record discussion regarding…

village name; alternate names given

language name; alternate names given

"do any other vills speak your lang?"

Part 2 

Note: Who took leadership in this activity? Was there a particular group directing the process?

Was there confusion as to the shift of definition/context from part 1 to 2?

Record discussion…

during green circle:

during yellow circle:

If all in yellow circle, of possible change:

during red circle:

If all in red circle, of possible change:

Was the tool readily understood (explain)?

What were problem areas/questions?

Were people involved or reluctant?

2 Actual Language Use

Record any discussions regarding the questions in this section, especially noting minority dissent. Note the question number on the left. Remember to note language use observations at the top of pg. 1 and to watch for people coming and going.

Q#

3 Social Relationship in the Area

3.1 *Are there any notable changes of atmosphere when asked about enemies? Does there seem to be community consensus?*

3.2 PM Tool 2 – Joint Activities

What were the major points of discussion?

Were any of the activities mentioned not commonly done?

Were any joint activities brought beyond our list?

Note: Who took leadership in this activity? Was there a particular group directing the process?

Was the tool readily understood (explain)?

What were problem areas/questions?

4 Church Language Use

Very Positive……Positive…...Reserved……Hostile/Resistant

Note: Who took leadership in this activity? Was there a particular group directing the process?

Perceived attitude toward V in church

What were the major points of discussion?

Were any of the activities mentioned not commonly done?

Were any joint activities brought beyond our list?

Were they able to dream about the future?

Was the tool readily understood (explain)?

What were problem areas/questions?

5 Work & Travel

Attitude towards…

companies in general

particular companies (list and describe)

the possibility of future companies

traveling for work or trade

D.4 Guide for interviews with teachers and pastors

Guided Interview for Teachers and Pastors | 2012

The interview guide provides topics ... within which the interviewer is free to... ask questions that will... illuminate that particular subject. Thus the interviewer remains free to build a conversation within a particular subject area... (Patton, p. 280)

TEACHER INTERVIEW

Village: _____ Date: _____ Interviewer: _____ Consent: ☐

Teacher's Name: _____ Position: _____ School Name: _____

Opening Q: Tell me about your experience becoming a part of this community.

		Evidence For... ↓	Evidence Against... ↓
Primary Teacher Only	T has lived in community for _____ (time)		
	T found it easy to make friends in the community		
	T found it easy to learn the V		
Community are proud of their V			
Community use the V			
Comm talk with T in V outside school & T answers in V			
T wants his children to learn the V			
T's children use the V with their friends in the village			
Children are fluent in V when they 1st join ELEM.			
ELEM. T encourages children to learn the V at school			
Parents support ELEM. teacher's use of V in school			↓

* * *When possible, tour school, note observations of V materials / use of V:

Consent!

Guided Interview for Teachers and Pastors | 2012

The interview guide provides topics ... within which the interviewer is free to... ask questions that will... illuminate that particular subject. Thus the interviewer remains free to build a conversation within a particular subject area... (Patton, p. 280)

PASTOR INTERVIEW

Village: _____ Date: _____ Interviewer: _____ Consent: ☐

Pastor's Name: _____ Church Name: _____

Opening Q: Tell me about your experience becoming a part of this community.

P has lived in community for _____ (time)	Evidence For... ↓	Evidence Against... ↓
P found it easy to make friends in the community		
P found it easy to learn the V		
The community are proud of their language		
The community use the V		
Comm talk with P in V outside church & P answers in V		
P wants his children to learn the V		
P's children use the V with their friends in the village		
Church is making V materials (eg songs) for church life		
Community desire a tok ples Bible		↓

What are the denominations in the village?

Consent!

Do you have any prayer requests (*prea point/samting b'long beten*)?

What circuits/districts are they a part of (record on back at bottom)?

* * *When possible, tour church, note observations of V materials / use of V:

D.5 Walkabout questionnaire

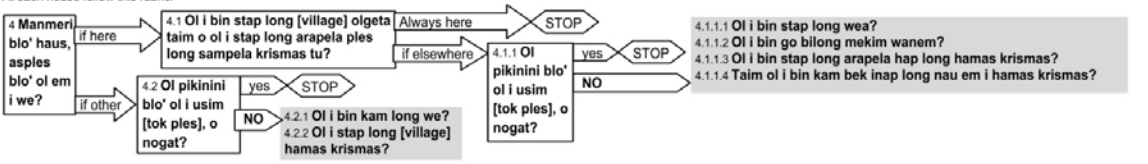
SILISILI SURVEY | WALKABOUT QUESTIONNAIRE TO ASSESS IMPACT OF MIGRATION ON VITALITY Surveyor:_____ Date: _____

Walk village with informant who can identify households. Sample only buildings where families or couples without children live. If a dwelling has only single person, it does not count as a household.

Group 1: Babuaf, Gumots, Maralangko, Maziu, Morom, Uruf, Wawas, Zinimb Singono, Mafanazo		Sample every household (see "HH to sample" figure on reverse side of this page).
Group 2: Chiats, Dangal		If **Q3** says village has NOT grown, sample every house. Otherwise as **Group 3** below.
Group 3: Bencheng, Dungutung	Identify the first and second households. Throw a dice. If it is an odd number, start with the first household. If it is an even number, start with the second household. Sample every second household from your starting point.	
Marauna	If **Q3** indicates Marauna has not grown, sample as **Group 3** above. Otherwise as on right>>>	Identify the first three households. Throw a dice. If it is 1 or 2, start with the first house. If it is 3 or 4, start with the second house. If it is 5 or 6, start with the third house. Sample every third house from your starting point.

1. **Dispela ples i gat wanem nem?** _____
2. **Na tok ples blo' [village] em i wanem?** _____
3. **[village] i kamap bikpela moa long tenpela krismas bipo o i go daun liklik?** Use answer to decide on methodology >>>>>>>>>>>>

At each house follow this rubric:



HH#	#imis/migs	where 4.2.1 / 4.1.1.1	time/purpose 4.2.2 /4.1.1.2	time 4.1.1.3	back time 4.1.1.4	HH#	#imis/migs	where 4.2.1 / 4.1.1.1	time/purpose 4.2.2 /4.1.1.2	time 4.1.1.3	back time 4.1.1.4	HH#	#imis/migs	where 4.2.1 / 4.1.1.1	time/purpose 4.2.2 /4.1.1.2	time 4.1.1.3	back time 4.1.1.4
01	if 0 write 0					**02**						**03**					
04						**05**						**06**					
07						**08**						**09**					
10						**11**						**12**					
13						**14**						**15**					
16						**17**		maralangko				**18**					
19						**20**						**21**					
22						**23**						**24**					
25						**26**		babuaf				**27**					
28						**29**						**30**					
31						**32**						**34**		morom			
34						**35**						**36**					
37		dangal				**38**		wawas				**39**					
40						**41**		gumots				**42**		chiats			

HH#	#imis/migs	where 4.2.1 / 4.1.1.1	time/purpose 4.2.2 /4.1.1.2	time 4.1.1.3	back time 4.1.1.4	HH#	#imis/migs	where 4.2.1 / 4.1.1.1	time/purpose 4.2.2 /4.1.1.2	time 4.1.1.3	back time 4.1.1.4	HH#	#imis/migs	where 4.2.1 / 4.1.1.1	time/purpose 4.2.2 /4.1.1.2	time 4.1.1.3	back time 4.1.1.4
43						**44**						**45**					
46						**47**						**48**					
49		maizu uruf				**50**						**51**					
52						**53**	singono					**54**					
55		marauna				**56**						**57**					
58						**59**		dungutung				**60**	mafazono				
61						**62**						**63**					
64		bencheng															

5. Cost of Items in Trade Stores: 5.1 Price of **1 kg of rice K**_____ 5.2 Price of **1 can tinned meat K**_____

Village	Maralangko	Zinimb	Babuaf	Morom	Wawas	Gumots	Maziu	Uruf	Singono	Mafanazo	Dangal	Chiats	Dungutung	Bencheng	Marauna
pop 2000	49	51	105	55	135	121	107	172	204	204	244	280	397	466	568
HH 2000	12	13	18	24	27	29	35	35	38	43	52	60	84	91	118
people/H 2000	4.08	3.92	5.83	2.29	5.00	4.17	3.06	4.91	5.37	4.74	4.69	4.67	4.73	5.12	4.81
2012 pop	68	71	146	77	188	169	149	240	284	284	340	390	553	649	791
critical immigrants	**5 - 7**	**5 - 7**	**11 - 15**	**6 - 8**	**14 - 19**	**12 - 17**	**11 - 15**	**17 - 24**	**21 - 29**	**21 - 29**	**25 - 34**	**28 - 39**	**40 - 56**	**47 - 65**	**57 - 80**
2012 est. HHs	17	19	26	34	38	41	49	49	53	60	73	84	118	127	165
interval	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**2**	**2**	**3**
HH to sample	**17**	**19**	**26**	**34**	**38**	**41**	**49**	**49**	**53**	**60**	**37**	**42**	**59**	**64**	**55**
90% confidence	14	14	18	23	24	25	28	28	30	32	35	38	43	44	48
interval	1.21	1.36	1.44	1.48	1.58	1.64	1.75	1.75	1.77	1.88	2.09	2.21	2.74	2.89	3.44
95% conf.	14	15	20	25	27	29	32	32	34	37	41	45	53	55	61
interval	1.21	1.27	1.30	1.36	1.41	1.41	1.53	1.53	1.56	1.62	1.78	1.87	2.23	2.31	2.70
99% conf.	15	16	22	28	31	33	38	38	40	44	50	56	69	72	82
interval	1.13	1.19	1.18	1.21	1.23	1.24	1.29	1.29	1.33	1.36	1.46	1.50	1.71	1.76	2.01

Choosing an interval that is the integer below the figure in the error table means that we can use that figure as our confidence level.
So if we did every 3rd house in Marauna we would be able to say we're 90% confident we're within 10% of the actual number of immigrants. This is good enough for our purposes.

D.6 Observation schedule for personal observation notebooks

Lg. Use Observations (always describe the situation):

- Children (primary school age or lower) lg. use:
  - Talk with adults
  - Talk with children their age
- Observe parents speaking to children

If Reported:	Shift	All/Most V	All/Most TP
Then Observe:	Use of V when you expect TP	Use of V when you expect TP	All uses of V
	Use of TP when you expect V	All uses of TP	Use of TP when you expect V

D.7 Observation schedule for church services

Church Service Observation Schedule **Feb2012**

Name of Church: _____ Village: _____Denomination : _____

Service Time from: __:____ to: __:____ # of people M: ____ W:____ C (-18):_____Observed by: _____

1. Mark ALL the languages used for each activity. If an activity was not done, X out the activity.

	Sande Skul	**Singsing Lotu**	**Liturgi**	**Ritim tok blo'God**	**Prea**	**Tok Save**	**Writing on banners/walls**	**Socializing before/after service**
Tok Pisin								
English								
V								
Other tok ples								

2. How was the message given? (Circle one response.)(Indicate which languages if possible)

a. In one language.
b. Translated phrase by phrase into a 2nd language by an interpreter.
c. Translated phrase by phrase into a 2nd language by the preacher.
d. Mainly in one language but the preacher sometimes used another language to give an explanation.
e. In one language but some people had translation individually from someone sitting next to them.
f. More than one message given during the service and they were done in different languages.

3. Were verses read during the message? In what language?

Yes/No Language: _____

4. How many people brought their Bibles?(Choose one response.)

□ Hardly anyone □ A few people □ Half □ More than half □ Almost everyone

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