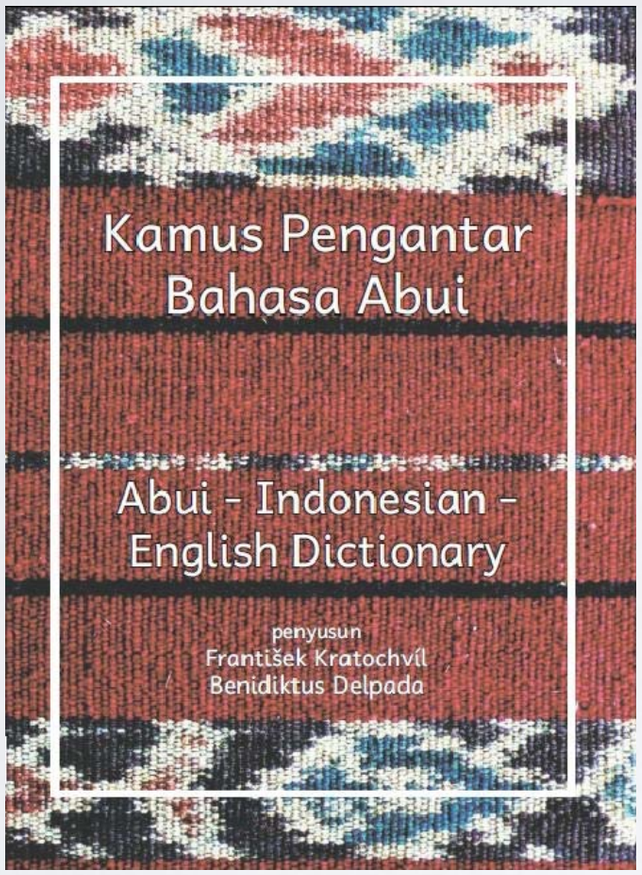
EXTENDING LEXICAL RESOURCES FOR ABUI
A PAPUAN LANGUAGE OF EAST INDONESIA



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OUTLINE OF THE TALK

Lexicographic workflow for ‘small’ languages

- Wordlists
- Textual corpus
- Rapid Words
- WordNet

Purpose and users

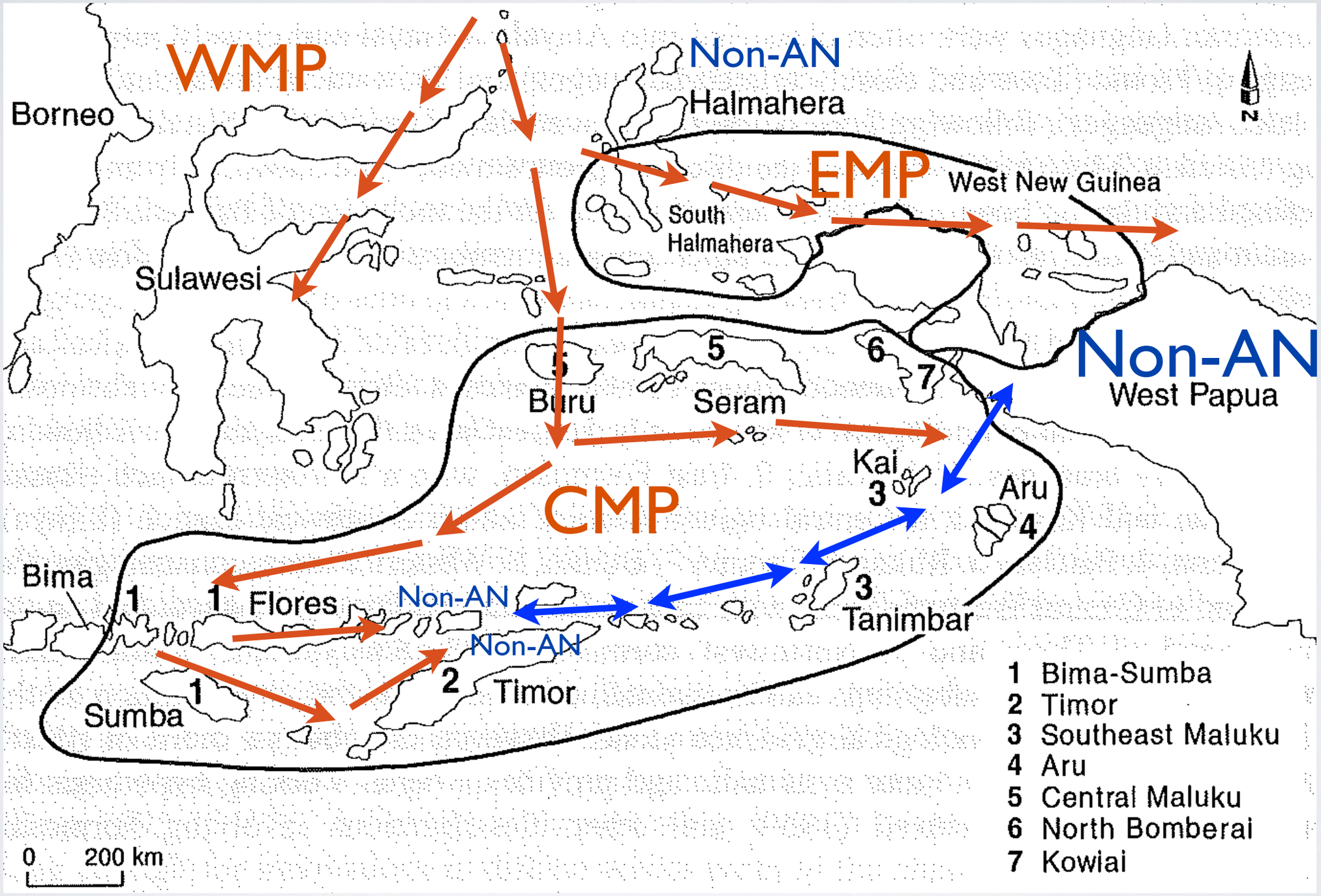
- L1 Community
- L1 Education & Literacy development
- Linguists
  - Comparative (Austronesian Basic Vocabulary Database, ACD
  - Typology
  - Language contact
  - Lexicography and Meaning (PanLex)

Issues

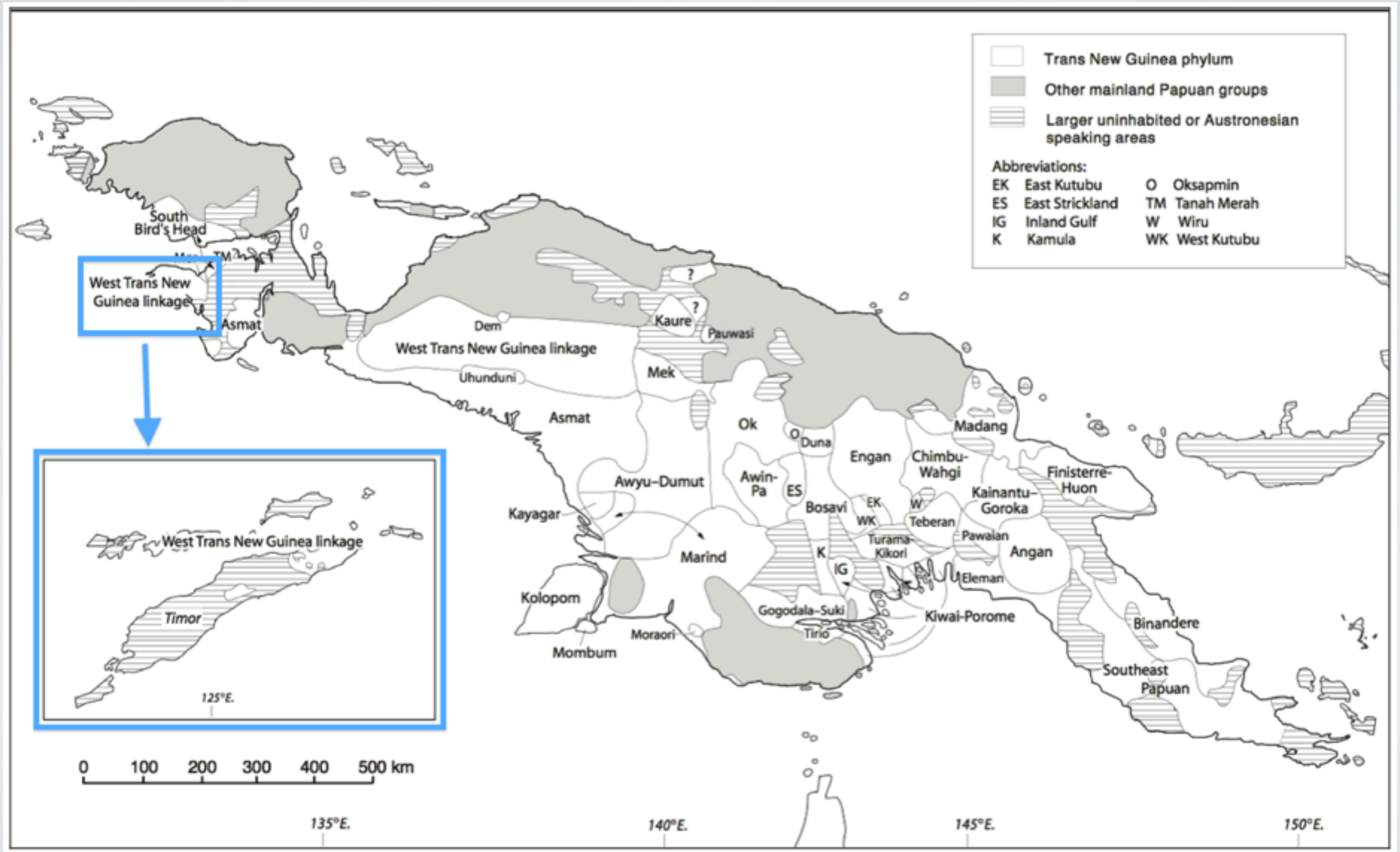
- Multiword expressions, idioms, proverbs, frequent metaphors, light verbs (many SVC)
- Organization and structure of dictionaries

EASTERN INDONESIA - GEOGRAPHIC LOCATION OF ALOR-PANTAR

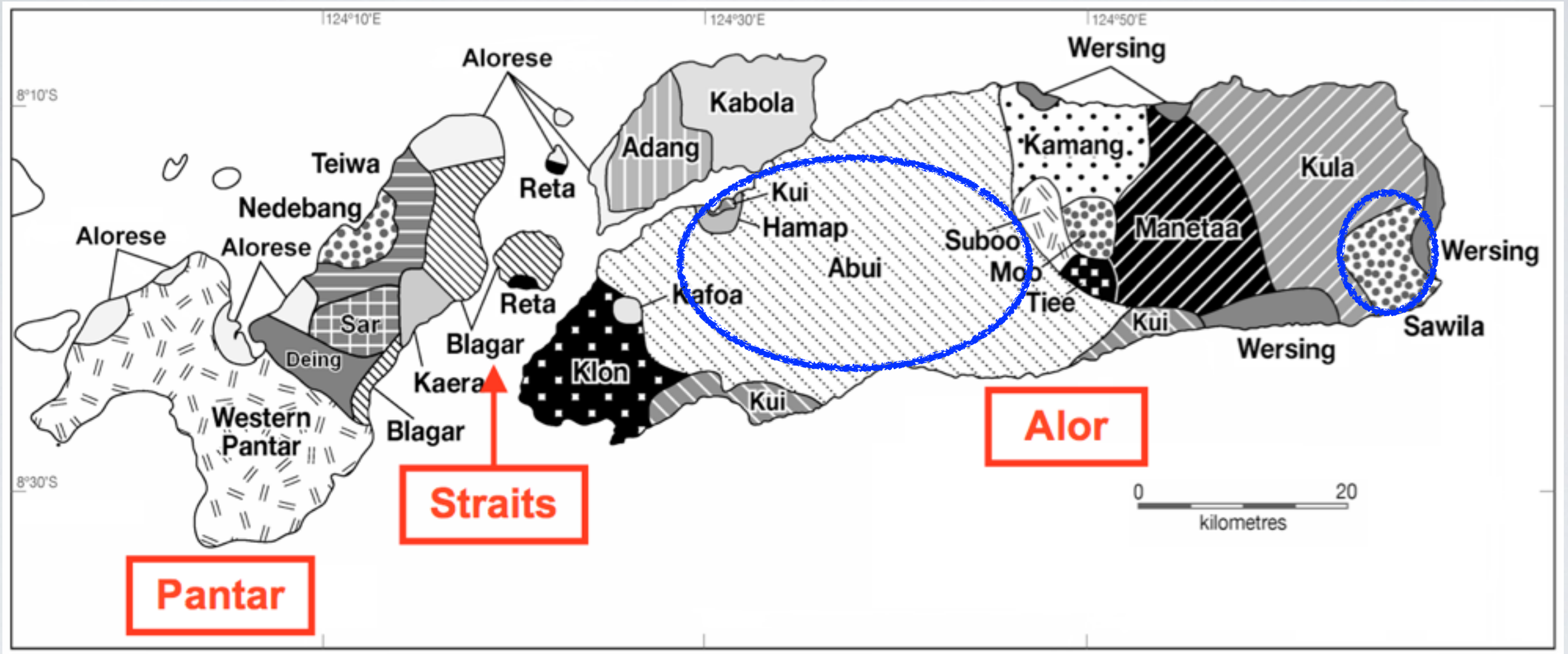
BODY-PART BASED EMOTION PREDICATES IN EAST INDONESIA (KLAMER 1999; MUSGRAVE 2006; DIX GRIMES N.D.)



LINGUISTIC SITUATION (NOT SUPPORTED IN HOLTON ET AL. 2012)



LINGUISTIC SITUATION IN ALOR-PANTAR ARCHIPELAGO



EVALUATION

- Language documentation approach is slow and relies on one or two authors
- There are more than 20 Alor-Pantar languages. Only 5 of them have small size dictionaries (Abui, Kamang, Sawila, Teiwa, and Western Pantar) created by 4 different linguists. For the remaining languages we only have wordlists (Holle lists, Stokhof lists, Pusat Bahasa wordlists).
- None of the dictionaries contains more than 4000 words although each of them took several years to create
- Random gaps - method of lexicon collection, preferences of compilers
- Only 4 have been printed and distributed in the communities.
- No sources in Dutch, but where available difficult to use (most people studying languages of Indonesia do not speak Dutch)

ABUI LEXICAL RESOURCES - EVALUATION

- František Kratochvíl: 2003-2008 (5 years, 3 years intensive)
- Benidiktus Delpada (1/2 year intensive)
- Published and distributed to the community in 2008.
- Financial support of Leiden University and Kabupaten Alor

Side-product of the corpus (Multi-Dictionary Formatter in SIL Toolbox)

Version 1: 2,700 lemmas, definitions in Indonesian and English, example sentences, synonyms, inflectional paradigms; short grammar sketch in Indonesian

Version 2: 3,000 lemmas, as above + Semantic Domains IDs (current stage)

Version 3 (discussed today): in 2016 or later (15,000 lemmas, remaining as above, WordNet linked)

ABUI LEXICON DEVELOPMENT

STAGE I

afu

lemma + pronunciation
wordclass (ind)
definition (ind/eng)

afu [ʔaˈfʊ] kb. ikan. fish. Na afu tahai. Saya mencari ikan, saya berusaha sebagai nelayan. I am fishing. lit.: I search fish.

Abui Dictionary (2008)

STAGE II

[ʔaˈfʊ] *n.* fish. **Na afu tahai.** I am fishing. lit.: I search fish. *Idiom:* **afu ia** 'may' *'masa petani memanen jagung/bulan mei'* 'musim panen jagung/bulan mei'; *Spec:* **afu kasing** 'split dry fish also a kind off fishes such as rayfish but has no htaili' *'ikan kering terbelah juga sj. ikan spt pari tetapi tidak mempunyai ekor'* 'ikan bela'; **afu tulok** 'dried small fish on a piece of bamboo' *'ikan kecil-kecil yg kering telah ditusuk pd tali'* 'ikan tali'; **tongkol** 'tuna fish' *'ikan tongkol'* 'ikan tongkol'; **tafeel** 'shark' *'hiu'* 'ikan hiu'; **fahaai** 'crocodile' *'buaya'* 'buaya'; **ramaak** 'garfish' *'ikan todak'* 'ikan todak'; **metiing isi**, **fariki**, **song afu**, **tefang** 'sardine' *'ikan sarden'* 'ikan tembang'; **pasimara**, **penkar**, **mora**, **fokal ara diesing**, **wesing**, **win**, **yeikoi** 'turtle' *'penyu/kura-kura'* 'penyu'; **belo-belo**, **matanggolong**, **kaai sapaat**, **yeri kika**, **hiyeng fokal**, **kafiyei mona**, **waysa afu**, **silik afu**, **wal hawa homi kika**, **tan**, **kela afu**, **spidol**, **lamoor**, **pal** 'rayfish' *'ikan pari'* 'ikan pari'; **leipang**, **lember**, **suwai** 'whale' *'ikan paus'* 'ikan paus'; **ku beeka**, **pokdai tala**, **fat tafuyang**, **malel**, **leipang**, **timiing**, **maleki**, **liwang fariki**, **kila fariki**, **afu tool**, **kombong**, **hiyeng rama**, **kora-kora**, **kopi taka**, **doomo**

Category: **Fish**.

idiom

hyponyms

semantic domain

Abui Dictionary (2014)

STAGE III - LINKING TO WORDNET

lemma & pronunciation >
part of speech >
gloss, reversal, and definition (ENG) >
gloss, reversal, and definition (IND) >
gloss, reversal, and definition (AM) >
example sentence & translations >
semantic domain ID & name >

```
\lx pok
\ph ˈpɔk
\ps v.0
\pn kki
\ge split
\re broken
\re smashed
\re split
\de split, burst, hatch, broken, smashed
\gn pecah
\rn retak
\rn menetas
\rn pecah
\dn pecah, menetas, retak
\gr peca
\rr menetas
\rr peca
\dr peca, menetas
\ref Poku.001
\xv Pingai nu hayei poku.
\xe A plate fell down and broke.
\xn Piring itu jatuh dan pecah.
\xr Piring tu jatu peca.
\ue
\un
\pd I (Perf)
\is 7.8
\sd Divide into pieces
\sdn Membagi sesuatu menjadi banyak bagian
\is 7.8.2
\sd Crack
\sdn Retak
\nt
\dt 03/Feb/2015
```

used for mapping

used for mapping

used for mapping

not yet used for mapping

STAGE III - LINKING TO WORDNET

full match: 10pt
neighbour: 1pt

triangulation score =
full + neighbour match

triangulation matrix
[1,1,1]

\lx pok
\ph ˈpɔk
\ps v.0
\pn kki
\ge split
\re broken
\re smashed
\re split
\de split, burst, hatch, broken, smashed
\gn pecah
\rn retak
\rn menetas
\rn pecah
\dn pecah, menetas, retak
\gr peca
\rr menetas
\rr peca
\dr peca, menetas
\ref Poku.001
\xv Pingai nu hayei poku.
\xe A plate fell down and broke.
\xn Piring itu jatuh dan pecah.
\xr Piring tu jatu peca.
\ue
\un
\pd I (Perf)
\is 7.8
\sd Divide into pieces
\sdn Membagi sesuatu menjadi banyak bagian
\is 7.8.2
\sd Crack
\sdn Retak
\nt
\dt 03/Feb/2015

lookup in English WN

lookup in Bahasa WN

lookup in WN-SemDom linking
(Muhammad Zulhelmy et al. 2014)

STAGE III - LINKING TO WORDNET - RESULTS

full match: 10pt
neighbour: 1pt

triangulation score =
full + neighbour match

triangulation matrix
[1,1,1]

\lx pok
\ph ˈpɔk
\ps v.0
\pn kki
\ge split
\re broken
\re smashed
\re split
\de split, burst, hatch, broken, smashed
\gn pecah
\rn retak
\rn menetas
\rn pecah
\dn pecah, menetas, retak
\gr peca
\rr menetas
\rr peca
\dr peca, menetas
\ref Poku.001
\xv Pingai nu hayei poku.
\xe A plate fell down and broke.
\xn Piring itu jatuh dan pecah.
\xr Piring tu jatu peca.
\ue
\un
\pd I (Perf)
\is 7.8
\sd Divide into pieces
\sdn Membagi sesuatu menjadi banyak bagian
\is 7.8.2
\sd Crack
\sdn Retak
\nt
\dt 03/Feb/2015

lookup in English WN

lookup in Bahasa WN

lookup in WN-SemDom linking
(Muhammad Zulhelmy et al. 2014)

RESULTS OF AUTOMATIC MATCHING

Triangulation type	Triangualation Score	Generated links	Sample	Match
Full (min 30; 1,1,1)	80~40	2368	100	83
Full (min 30; 1,1,1)	32~30	2368	100	73
ENG+IND (min 20; 1,1,0)	61~31	3032	100	61
ENG+IND (min 20; 1,1,0)	20	3032	100	34
ENG+ZSM (min 20; 1,0,1)	31-20	206	100	56
ENG+ZSM (min 20; 1,0,1)	20	206	100	45
IND+ZSM (min 20; 0,1,1)	63-31	4877	100	**61**
IND+ZSM (min 20; 0,1,1)	20	4877	100	42
ENG (min 10; 1,0,0)	32~20	9716	100	67
ENG (min 10; 1,0,0)	10	9716	100	7
IND (min 10; 0,1,0)	32~21	17380	100	55
IND (min 10; 0,1,0)	10	17380	100	11
ZSM (min 10; 0,0,1)	21~11	1582	100	44
ZSM (min 10; 0,0,1)	10	1582	100	21

We automatically generated about 39k links to 3 WNs. The accuracy scores, as judged by FK, given below.

COMMON PROBLEMS (1) - TYPOS

Alor Malay: tuju ‘seven’

yeting-ayoku ‘seven’	num	11467996-n	10	[0, 0, 1]	the striking of a light beam on a surface	incidence	tuju

tuju I [Wilk32:37758] *DjVu*

1. Pointing at; making straight for; aiming at; = ([**ETY:** KEDAH MALAY.]) pĕrĕmbang.
   Also the name for a kind of witchcraft (described below).
   Tujuï and mĕnuju: to aim at; to make for; to assail by sorcery.
   Pĕnuju: rows of stakes (supporting screens) for guiding fish into large traps (bĕlat Bĕtawi, bĕlat kĕmbang).
   Sa-tu^ju: in unison; in harmony; with the same aims. Mĕnuju tuding: to aim so as to hit the side.
   Tiap-tiap pĕrkataan itu mĕnuju ia kapada tujuan-nya: every word he used went straight to its mark.

The form of sorcery described as tuju is one of those most feared by Malays. In essence it means "pointing out" your victim to a spirit of evil or setting the spirit of evil at him. It is regarded as potentially deadly; cf.: mĕnuju orang sampai mati (aim spells at a man till he dies), [LIT: *Ht. Abd. 283*]; and adinda sudah kĕna (di-tuju) nyaris tiada mati (I was struck by a spell and nearly died), [LIT: *Mal. Dewa 115.*] In another passage ([LIT: *Mal. Dewa 116*]) the procedure is described; the wizard-king called up the evil spirit known as jin panah Ranjuna (Arjuna's arrow) by means of a magic formula (man-tĕra), and then directed it at his victim, whom it struck and slew.
But protective magic could be used against this tuju, cf.

SEAlang Malay Dictionary

COMMON PROBLEMS (II) - TOO MANY MATCHES IN BAHASA WN

Abui *hayik* 'carry on one's head'

10	lift or elevate	heft; heave up; heft up; heave	*beralun; mengangkat; membinjat; mengalun*
10	raise in rank or condition	raise; lift; elevate	*memperbaiki; meningkatkan; memulihkan keadaan; naikkan; membinjat; memiara; mencaduk; menyondang; meninggikan; menyingsinng; mengemukakan; membesarkan; memeliharakan; menggembirakan; menimbulkan; mengumpil; menaikkan; meroket; mengangkat; memelihara; menganjungkan; membubungkan*
10	form an arch or curve	curve; arc; arch	*melaur; mengangkat; melengkung; melentur; terangkat*
10	give a promotion to or assign to a higher position	upgrade; kick upstairs; raise; advance; elevate; promote	*memperbaiki; dinaikkan pangkat; meningkatkan; membangkit; menyorongkan; naikkan; pendahuluan; memiara; menaikkan pangkat; maju; mencaduk; meninggikan; membesarkan; memeliharakan; menaikkan; tingkat; meroket; bergerak ke hadapan; mara; mengangkat; naik; memelihara; berkembang maju; membubungkan*

COMMON PROBLEMS (III) - MEANING EXTENSIONS

Abui *faala* 'wooden tray on house posts or for carrying food'

faala	n	21	used to reproduce music by rotating while a phonograph needle tracks in the groove; sound recording consisting of a disk with a continuous groove	disc; disk; phonograph record; phonograph recording; record; platter
faala	n	21	a memory device consisting of a flat disk covered with a magnetic coating on which information is stored	disc; magnetic disc; magnetic disk; disk

Abui *heteitu* 'first, the first one' > gear?? not sure

heteitu	n	20	the lowest forward gear ratio in the gear box of a motor vehicle; used to start a car moving	low gear; first gear; first; low

NEXT STAGE - MATCHING TO SEMANTIC DOMAINS

Building on the comparative dictionaries of synonyms and on thesauri tradition in lexicography. The ontology has to be coarse-grained to allow for semantic shift (intuitive and associative relationships included).

No.	Domain
1	**Universe, creation**
1.1	Sky
1.2	World
1.3	Water
1.4	Living things
1.5	Plant
1.6	Animal
1.7	Nature, environment
2	**Person**
2.1	Body
2.2	Body functions
2.3	Sense, perceive
2.4	Body condition
2.5	Healthy
2.6	Life
3	**Language and thought**
3.1	Soul, spirit
3.2	Think
3.3	Want
3.4	Emotion
3.5	Communication
3.6	Teach
4	**Social behavior**
4.1	Relationships
4.2	Social activity
4.3	Behavior
4.4	Prosperity, trouble

No.	Domain
4	**Social behavior** (cont)
4.5	Authority
4.6	Government
4.7	Law
4.8	Conflict
4.9	Religion
5	**Daily life**
5.1	Household equipment
5.2	Food
5.3	Clothing
5.4	Adornment
5.5	Fire
5.6	Cleaning
5.7	Sleep
5.8	Manage a house
5.9	Live, stay
6	**Work and occupation**
6.1	Work
6.2	Agriculture
6.3	Animal husbandry
6.4	Hunt and fish
6.5	Working with buildings
6.6	Occupation
6.7	Tool
6.8	Finance
6.9	Business organization

No.	Domain
7	**Physical actions**
7.1	Posture
7.2	Move
7.3	Move something
7.4	Have, be with
7.5	Arrange
7.6	Hide
7.7	Physical impact
7.8	Divide into pieces
7.9	Break, wear out
8	**States**
8.1	Quantity
8.2	Big
8.3	Quality
8.4	Time
8.5	Location
8.6	Parts of things
9	**Grammar**
9.1	General words
9.2	Part of speech
9.3	Very
9.4	Semantic constituents related to verbs
9.5	Case
9.6	Connected with, related
9.7	Name

Figure 2: Top two levels of the Semantic Domains

SEMANTIC DOMAINS - 5 LEVELS OF NESTING

1.6 Animal
1.6.1 Types of animals
1.6.1.1 Mammal
1.6.1.1.1 Primate
1.6.1.1.2 Carnivore
1.6.1.1.3 Hoofed animals
1.6.1.1.4 Rodent
1.6.1.1.5 Marsupial
1.6.1.1.6 Anteater, aardvark
1.6.1.1.7 Sea mammal
1.6.1.1.8 Bat
1.6.1.2 Bird
1.6.1.3 Reptile
1.6.1.3.1 Snake
1.6.1.3.2 Lizard
1.6.1.3.3 Turtle
1.6.1.3.4 Crocodile
1.6.1.4 Amphibian
1.6.1.5 Fish
1.6.1.6 Shark, ray
1.6.1.7 Insect

- 5 levels of nesting
- very associative grouping
- easy to work with
- based on thesauri and comparative dictionaries
- multilingual tool (in 12 languages - at least partly developed)
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SEMANTIC DOMAINS

1.6.1.5 Fish

Use this domain for fish (phylum Chordata, class Osteichthyes).

(1) What general words refer to animals that live in the water?
- *fish, water animal, sea creature*

synonyms

(2) What species of freshwater fish are there?
- *trout, minnow, catfish, mudfish, perch*

(3) What species of saltwater fish are there?
- *anchovy, barracuda, bass, blackfish, bonefish, bream, carp, cod, codfish, crappie, darter, flatfish, flounder, gar, garfish, garpike, goldfish, grouper, guppy, halibut, herring, lungfish, mackerel, marlin, pickerel, pike, piranha, pollack, pompano, sailfish, salmon, sardine, sea horse, shad, sole, spearfish, sturgeon, sucker, sunfish, swordfish, tarpon, tuna, turbot, whitefish, whiting, wrasse*

hyponyms

(4) What words refer to the very small animals in the ocean?
- *plankton*

associated food source

(5) What words describe where a fish lives?
- *freshwater, saltwater, pelagic, marine, aquatic*

location

(6) What words describe fish?
- *bony, finned, jawed, jawless, lobe-finned, poisonous, snouted*

feature, property

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SEMANTIC DOMAINS

1.1 Sky

Use this domain for words related to the sky.

(1) What words are used to refer to the sky?
- *sky, firmament, canopy, vault*

synonyms

(2) What words refer to the air around the earth?
- *air, atmosphere, airspace, stratosphere, ozone layer*

part-whole

(3) What words are used to refer to the place or area beyond the sky?
- *heaven, space, outer space, ether, void, solar system*

spatially adjacent

(4) What words describe something in the sky or something that happens in the sky?
- *aerial, heavenly, atmospheric, stratospheric, celestial,*

derived modifiers

(5) What words describe the appearance of the sky?
- *blue, clear, black (night), cloudy, cloud filled, brilliant, dark, night sky, foreboding, stormy, dark, star studded*

common states

(6) What words refer to the edge of the sky where it meets the ground?
- *horizon, skyline*

associated location

(7) What words refer to something in the sky?
- *heavenly body, celestial body, luminary*

part-whole

(8) What words refer to the lights that appear in the northern (or southern) sky?
- *aurora borealis, northern lights*

part-whole

(9) What words refer to something being in the sky?
- *aloft, up in the sky, up in the air,*

location

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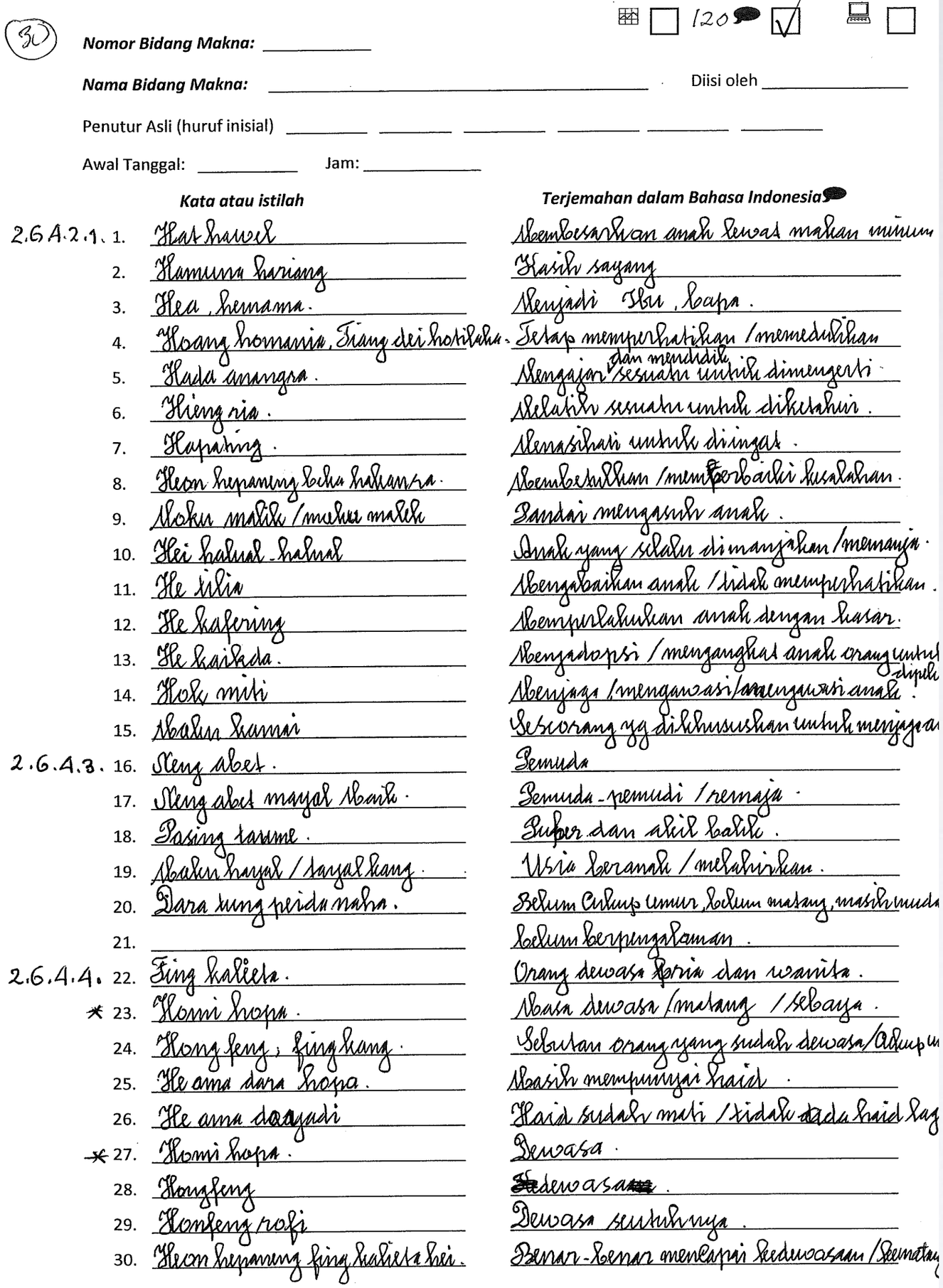
OLD DICTIONARY PRINTED ACCORDING TO SD SYSTEM ALONG WITH THE QUESTIONNAIRES

TEAMS WORK THROUGH ASSIGNED SECTIONS OF THE DICTIONARY ALONG WITH THE SD QUESTIONNAIRE WRITING DOWN NEW WORDS AND CORRECTIONS

WE ARE USING A LOCAL SCHOOL - CHILDREN GOT 3 DAYS OFF, EVERYONE IS HAVING FUN

EACH WORD COLLECTED IS RECORDED WITH AN EXAMPLE SENTENCE



(30)

Nomor Bidang Makna: _____

Nama Bidang Makna: _____ Diisi oleh _____

Penutur Asli (huruf inisial) _____ _____ _____ _____ _____ _____

Awal Tanggal: _____ Jam: _____

		Kata atau istilah	Terjemahan dalam Bahasa Indonesia
2.6.4.2.1.	1.	Hat hawel	Membesarkan anak lewat makan minum
	2.	Hamuna hariang	Kasih sayang
	3.	Hea, hemama.	Menjadi Ibu, bapa.
	4.	Hoang homania, Tiang dei hotilaha.	Tetap memperhatikan / memedulikan
	5.	Hada anangra.	Mengajar dan mendidik sesuatu untuk dimengerti.
	6.	Hieng ria.	Melatih sesuatu untuk diketahui.
	7.	Hapating.	Menasihati untuk diingat.
	8.	Heon hepaneng beka hakanra.	Membetulkan / memperbaiki kesalahan.
	9.	Moku malik / moku malek	Pandai mengasuh anak.
	10.	Hei halual-halual	Anak yang selalu dimanjakan / memanja.
	11.	He tilia	Mengabaikan anak / tidak memperhatikan.
	12.	He kafering	Memperlakukan anak dengan kasar.
	13.	He kaikda.	Mengadopsi / mengangkat anak orang untuk dipeli
	14.	Hok miti	Menjaga / mengawasi / mengawasi anak.
	15.	Maku kamai	Seseorang yg dikhususkan untuk menjaga a
2.6.4.3.	16.	Neng abet.	Pemuda
	17.	Neng abet mayal Maik.	Pemuda-pemudi / remaja.
	18.	Pasing taume.	Puber dan akil balik.
	19.	Maku hayal / tayal kang.	Usia beranak / melahirkan.
	20.	Dara tung peida naha.	Belum cukup umur, belum matang, masih muda
	21.		belum berpengalaman.
2.6.4.4.	22.	Fing kalieta.	Orang dewasa pria dan wanita.
*	23.	Homi hopa.	Masa dewasa / matang / sebaya.
	24.	Hong feng; fing kang.	Sebutan orang yang sudah dewasa / cukup u
	25.	He ama dara hopa.	Masih mempunyai haid.
	26.	He ama daayadi	Haid sudah mati / tidak ada haid lag
*	27.	Homi hopa.	Dewasa.
	28.	Hongfeng	~~Ke~~dewasa.
	29.	Honfeng rofi	Dewasa seutuhnya.
	30.	Heon hepaneng fing kalieta hei.	Benar-benar mencapai kedewasaan / kematang

NEW DATA

- 7 days (20+ participants): 15,000 words

Currently digitising (7,000 digitised)

- adding and verify the Indonesian glosses
- adding English glosses > automatic
- adding WN links > automatic
- link to synonyms and antonyms > automatic

DIGITISED DATA

Meibeka	Jelek	2.3.1.8.2	Ugly	Jelek
He on hepaneng meibeka	Perbuatan dan tingkah lakunya tidak bagus	2.3.1.8.2	Ugly	Jelek
Heng amakang	Yang penting manusia	2.3.1.8.2	Ugly	Jelek
Amakang pilasama	Manusia itu sama	2.3.1.8.2	Ugly	Jelek
Meibeka	Jelek, tidak baik	2.3.1.8.2	Ugly	Jelek
Tomi hatiknaha	Tidak dimengerti	2.3.1.8.2	Ugly	Jelek
Hapong aliking	Ganas, seram	2.3.1.8.2	Ugly	Jelek
Aliking naha	Tidak ganas	2.3.1.8.2	Ugly	Jelek
Kafering naha	Tidak ganas	2.3.1.8.2	Ugly	Jelek
Lakang meibeka	Sangat jelek	2.3.1.8.2	Ugly	Jelek
Tomi lahel diei	Merasa jengkel	2.3.1.8.2	Ugly	Jelek
Ama hapada	Manusia aneh	2.3.1.8.2	Ugly	Jelek
Meibeka	Jelek, buruk, tidak baik	2.3.1.8.2	Ugly	Jelek

- adding English glosses and WN links > automatic

SEMI-AUTOMATIC LINKING OF SEMANTIC DOMAINS AND WORDNET (MUHAMMAD ET AL. 2014)

LVL	Example	# IDs	ID linked to WN		≥ 1 relation		≥ 2 relation		monosemous	
			eng	ind	eng	ind	eng	ind	eng	ind
1	1: universe	9	3	4	3	4	1	2	1	1
2	1.1: sky	68	54	46	27	27	6	13	7	7
3	1.1.1: sun	419	252	237	73	74	16	32	33	29
4	1.1.1.1: moon	985	702	605	90	69	8	8	86	65

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English			Indonesian		
8.4.1	15113229-n	period of time	8.4.1	15115926-n	jangka waktu
		Hyponym			Hyponym
8.4.1.2	14484516-n	day	8.4.1.2	14484516-n	hari
8.4.1.3	15135996-n	week	8.4.1.3	15135996-n	minggu
8.4.1.4	15206296-n	month	8.4.1.4	09358226-n	bulan
8.4.1.5	00294884-v	season	8.4.1.5	15239292-n	musim
8.4.1.6	15201505-n	year	8.4.1.6	15201505-n	tahun
8.4.1.7	15248564-n	era	8.4.1.7	15248564-n	zaman
		not mapped			not mapped
8.4.1.1	08266849-n; 06487395-n; 15173479-n	Calendar	8.4.1.1	15173479-n	Kalender
8.4.1.8	NIL	Special days	8.4.1.8	NIL	Hari-hari khusus

Table 4: Example of a good 2nd level mapping

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	English		Indonesian
8.3.3.3.4:	colors of the spectrum	8.3.3.3.4:	rentetan warna yang diuraikan oleh cahaya
3:	language and thought	3:	bahasa dan pikiran
9.4:	semantic constituents related to verbs	9.4:	konstituen atau unsur semantik yang berkaitan dengan
1.3.5:	solutions of water	1.3.5:	larutan air
2.3.1.9:	something used to see	2.3.1.9:	sesuatu yang digunakan untuk melihat

Table 2: **SD** main words not mapped to **WN**

- Benefits of the mapping: we can import definitions from PWN and Bahasa WordNet.
- The definitions could serve as a model for native definitions and the false definitions will be rejected by the native speakers.
- We will also automatically suggest synonyms and these can be again approved or rejected.

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NEXT FIELD SEASON

- manual checking of WN links and senses (can contribute to Bahasa WN)
- write Indonesian definitions > we need guidelines
- provide pronunciation and example sentence
- record the phonetic form
- provide additional information about inflectional paradigm, etc.
- record dialectal forms

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