

## Final nasal consonants and nasalised vowels in Ikaan

Sophie Salfner, SOAS

ss123@soas.ac.uk

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### 1 Introduction

Nasal vowels are not very common cross-linguistically. In West African languages, however, nasal vowels are widespread, as shown in Figure 1, and show a range of different systems of contrasts, as shown in Figure 2.

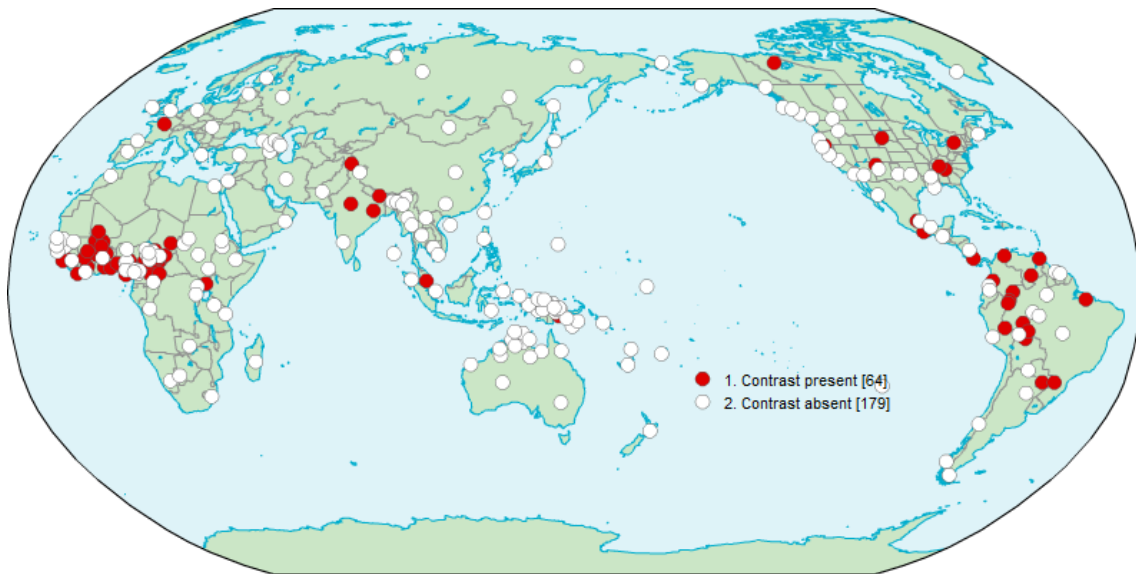


Figure 1 Cross-linguistics distribution of nasal vowels (Hajek 2005)

In the origin of nasal vowels, nasal consonants are said to play a major role. In early work, Ferguson (1966: 59) traces nasal vowels back to the loss of a nasal consonant. Greenberg (1966: 508-9) refines this position, adding that in the historical development nasality first spreads from a following nasal consonant to a preceding oral vowel. In a second step, the nasal consonant is deleted leaving a nasal vowel behind, i.e. in a sequence  $VN > \tilde{V}N > \tilde{V}$ .

Nasal consonants are also argued to play a role in the origin of nasal vowels in Niger-Congo languages. However, there is no agreement yet over whether it is the preceding or the following nasal consonant that nasalises the vowel. Stahlke (1971) argues for nasal coda consonants as the source of nasality on the vowel. His analysis accounts for languages such as Ewe and Yoruba where there are no contrasting  $C\tilde{V}$  and  $CVN$  sequences.

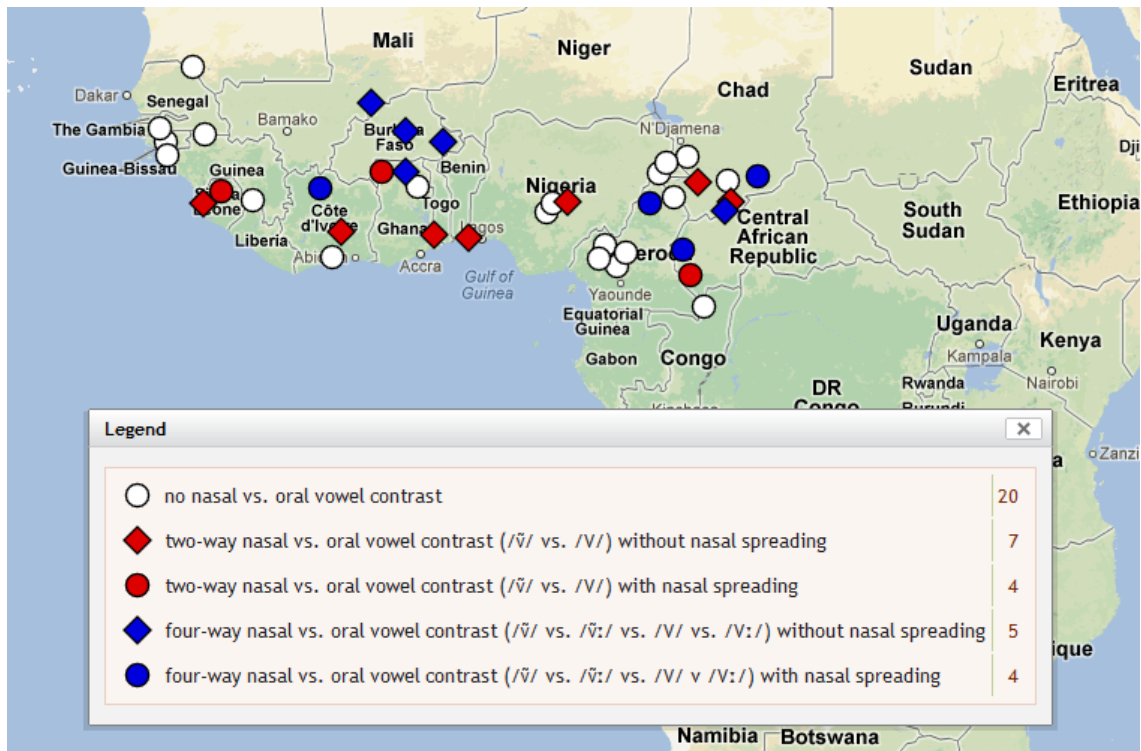


Figure 2 Nasal vowels in West Africa (Hajek 2011)

However, languages such as Akan have both nasal vowels and oral vowels followed by nasal consonants. This poses a challenge for a  $CVN > C\tilde{V}N > C\tilde{V}$  analysis, as Stahlke (1971) readily admits. Hyman (1972) and Williamson (1973) propose an alternative analysis. Hyman (1972) argues that it is a preceding nasal consonant that leads to the nasalisation of the vowel and is subsequently deleted, citing supporting data from Bamileke, Nupe and Jukun and Akan. Williamson (1973) partially agrees with Hyman and provides further evidence from Idoma and Ijo, but additionally discusses deletion of intervocalic nasals as another source for nasalised vowels.

Hyman (1972) discusses a number of predictions that fall out of Stahlke's (1971) hypothesis. The distribution of nasal vowels, their phonological behaviour as well as dialect variation should all support a  $CVN > C\tilde{V}N > C\tilde{V}$  analysis. Firstly, nasal vowels should have a specific and a restricted distribution, and there should be no final nasal consonants. Secondly, phonological processes should show alternations similar to French *bon garçon* [bõ garsõ] 'good boy' and *bon ami* [bõn ami] 'good friend'. Thirdly, variation between dialects should give evidence for the various stages in the development from  $CVN > C\tilde{V}N > C\tilde{V}$ . Stahlke (1971), Hyman (1972) and Williamson (1973) all provide supporting examples for this hypothesis from a range of Volta-Congo languages. More recent data from Oko (Atoyebi 2009) also shows the distribution patterns and phonological processes that give substance to Stahlke's (1971) proposal. Proto Guang and its southern daughter languages (Snider 1990) add examples of dialect variation.

The present article takes the discussion of nasal vowels and consonants as a point of departure for showing data from Ikaan, one of the four lects that comprise the Ukaan cluster. The four lects Ikaan, Ayegbe, Igau and Iyinno are spoken in five villages in the Akoko area of south-western Nigeria. The Ikaan lect spoken in Ikakumo (Ondo) has been the focus of language documentation and description work by Sophie Salfner, and this paper reports on some of the findings of the research.

Ikaan shows unusual patterns for nasal vowels and consonants. Even though every oral vowel in Ikaan has a nasal counterpart, there is distributional asymmetry between oral and nasal vowels, and oral and nasal vowels seem to be affected differently by some phonological processes. Still, it is the behaviour of the nasal consonants that for now is more striking. Nasal consonants also show asymmetry in their distribution as well as in the phonological processes they undergo. Final /n/ and final /m/ undergo different processes, and speakers vary in how they treat /n/ and /m/.

The following section gives essential background to nasal vowels and consonants in Ikaan. Section 3 discusses the phonological behaviour as well as first observations on speaker variation within the Ikaan lect. Section 4 zooms in on final /m/ and compares Ikaan final /m/ to words in other Benue-Congo languages. Section 5 summarises and discusses what makes Ikaan final nasals interesting, how they might support proposals for where nasal vowels come from, and where Ikaan might fit within the Benue-Congo family.

Unless otherwise indicated, all Ikaan data presented here is taken from Sophie Salfner's own on-going field research on Ikaan. Recordings and annotations on final nasal vowels and consonants are published with this paper (see appendix). More data is available from the Ikaan deposits at the Endangered Languages Archive (Salfner 2010a; Salfner 2012).

## **2 Phonological background to nasal vowels and consonants in Ikaan**

This section describes the forms and constraints on the distribution of nasal vowels and consonants in Ikaan. It also outlines general phonological constraints and processes that are relevant for the discussion later on. For more detailed information on the Ikaan phonology see Salfner (2010b).

### **2.1 Nasal vowels and consonants and their distribution**

Ikaan has nine oral vowels /i ɪ e ε a o ɔ u ʊ/. Each vowel is either short or long. Every short oral vowel has a short nasal vowel counterpart. For long vowels, nasal counterparts are attested except for /ē: ũ:/. It remains to be seen whether this gap is a systematic or accidental gap in the language, or whether it is a gap in the data that will be filled when more data is collected. Nasal vowels do not occur word-initially in the noun class prefixes, class agreement prefixes or verbal prefixes. In all other positions, nasal vowels are attested.

Research on nasal vowels in Ikaan is in its early stages, therefore only preliminary comments on the number and distribution of nasal vowels can currently be made. It is also important that while all care has been taken to transcribe nasality correctly, it cannot be guaranteed that nasality is always transcribed accurately. For further research on nasal vowels it is therefore recommended to consult the original recordings in Salfner (2010a; 2012) and not to work with the transcriptions presented here. More research is in progress.

Ikaan has three nasal consonant phonemes: the bilabial nasal /m/, the alveolar nasal /n/, and the labiovelar nasal /ŋm/. In some borrowed words from Yoruba or English, velar nasals also occur, for example in ìkòṅgá ‘well’.

Ikaan has V, CV and CVC syllables. The vowel in each of the syllable types may be long or short, as shown in (1). V syllables occur only as prefixes of most word classes. All roots begin in consonants. CV is the most frequent syllable type. CVC syllables are frequent, though there are restrictions on which consonant may occur in the final slot. Attested consonants in C<sub>2</sub> position are /b t d g m n f ʃ dʒ r ɾ j<sup>1</sup>/.

(1) Syllable type	Ikaan	Gloss
V	ò.bá	‘s/he fetched’
V:	ǎ.bà	‘s/he knew’
CV	ò.fá.rì	‘s/he washed’
CV:	ò.fǎ:rǐ	‘s/he fried’
CVC	ò.jén	‘wife’
CV:C	ì.dzě:n	‘yesterday’

All three nasal consonants occur root-initially. Root-medially and root-finally only /m n/ occur. The labiovelar /ŋm/ does not occur root-medially or root-finally, and with the exception of a few reduplicated forms, /ŋm/ does not occur word-medially either. As the labiovelar plosives /kp gb/ almost never occur root-medially and never occur root-finally either, this restriction of /ŋm/ to root-initial position mirrors the distribution of Ikaan labiovelars in general and can therefore be explained without making special reference to nasality.

## 2.2 Phonological constraints and processes in Ikaan

Ikaan does not allow consonant clusters or vowel clusters. To avoid such prohibited sequences across word boundaries, vowel deletion, vowel assimilation, vowel epenthesis and consonant deletion are employed. Which process applies depends on the phonological and morphosyntactic context.

<sup>1</sup> It is possible that there is also final /w/, though this has to be investigated further.

Vowel deletion occurs in verb plus object constructions. The final vowel of the first word is deleted, the initial vowel of the second verb remains.

- (2) ò-fà      èwí      →      [òf èwí]  
 3SG-hit    goat  
 ‘S/he hit the goat.’

Vowel assimilation occurs for example in noun plus modifier constructions, for instance with nouns followed by possessive pronouns. In vowel assimilation, the first vowel in a  $V_1 \# V_2$  sequence assimilates to the second vowel.

- (3) òtá      òrò      →      [òtó òrò]  
 lamp    2SG.POSS  
 ‘your (sg.) lamp’

Vowel epenthesis breaks up adjacent consonants by inserting an underlyingly high vowel<sup>2</sup>. The high vowel follows rounding harmony with the preceding vowel and receives the tone of the preceding tone-bearing unit, as shown in (4).

- (4) [-round]    ùbít      d̀̀:      →      [ùbít í d̀̀:]  
                   oil          DEM.PROX  
                   ‘this oil’  
                   òjén      j̀̀:      →      [òjén í j̀̀:]  
                   woman    DEM.PROX  
                   ‘this woman’  
                   ìkàʃ      d̀̀:      →      [ìkàʃ ì d̀̀:]  
                   town      DEM.PROX  
                   ‘this town’  
 [+round]    òhún      ǹ̀:      →      [òhún ú ǹ̀:]  
                   tree      DEM.PROX  
                   ‘this tree’  
                   èkpòd    ǹ̀:      →      [èkpòd ù ǹ̀:]  
                   hare      DEM.PROX  
                   ‘this hare’

Consonant deletion only occurs with the consonants /m g/, and only in very specific contexts. If /m/ or /g/ are in word-final position and encounter a consonant-initial word, they delete.

<sup>2</sup> It is not yet clear whether the epenthetic vowel is [-ATR] or [+ATR]. Work on this remains to be done, therefore the data here should not be used for ATR research. Original recordings of epenthetic vowels are available in the Ikaan corpus at the Endangered Languages Archive.

- (5) òjím jǝ̀: → [òjí jǝ̀:]  
 friend DEM.PROX  
 ‘this friend’  
 ùjág dǝ̀: → [ùjá dǝ̀:]  
 food DEM.PROX  
 ‘this food’

If /m/ occurs phrase-finally, it also deletes. In this context /g/ however does not delete.

- (6) ò-jé ènóm → [òj é<sup>h</sup>nóm]  
 3SG-eat meat  
 ‘S/he ate meat.’  
 ò-jé ùjág → [òj ú<sup>h</sup>ájág]  
 3SG-eat food  
 ‘S/he ate food.’

The following section picks up on these phonological processes and shows how nasal vowels and consonants in Ikaan are interesting because of their behaviour. Whereas /n/ is a perfectly well-behaved consonant, /m/ differs from most other consonants. Nasal vowels also do not behave in quite the same way as oral vowels, though the picture is still a bit mixed.

### 3 Phonological behaviour of nasals in Ikaan

#### 3.1 Final nasal vowels

As shown in (2) and (3) above, final oral vowels either delete or assimilate when they encounter another vowel across a morpheme boundary. Many final nasal vowels, however, do not undergo vowel deletion or assimilation but remain as nasal vowels. Examples for non-reduplicated and reduplicated forms are given in (7). All data is taken from dataset ikaan244. It is important to point out that in these examples with final nasal vowels there are no following surface nasal consonants, so no alternation parallel to French *bon garçon* [bɔ̃ ɡarsɔ̃] ‘good boy’ vs. *bon ami* [bɔ̃n ami] ‘good friend’.

- | (7) | in isolation          | noun + modifier             | Gloss                      |
|-----|-----------------------|-----------------------------|----------------------------|
|     | àʃǝ̀:                 | àʃǝ̀: à:dʒ                  | ‘(my) eggs’                |
|     | èfí:                  | èfí: è:dʒ                   | ‘(my) he-goat’             |
|     | ùrǝ̀:                 | ùrǝ̀: ù:dʒ                  | ‘(my) bow’                 |
|     | òtǝ̀                  | òtǝ̀ èkèrè                  | ‘the bottom (of the pot)’  |
|     | àfǝ̀:                 | àfǝ̀: à:dʒ                  | ‘(my) forehead’            |
|     | àjǝ̀ <sup>h</sup> jǝ̀ | àjǝ̀ <sup>h</sup> jǝ̀: à:dʒ | ‘(my) (species of) maggot’ |
|     | ìjǝ̀ <sup>h</sup> jǝ̀ | ìjǝ̀ <sup>h</sup> jǝ̀: ì:dʒ | ‘(my) sun’                 |

(7)	in isolation	noun + modifier	Gloss
	èwí <sup>́</sup> wí <sup>́</sup>	èwí <sup>́</sup> wí <sup>́</sup> è:dʒ	‘(my) mosquito’
	èjìjì <sup>̀</sup>	èjìjì <sup>̀</sup> è:dʒ	‘(my) scorpion’
	ìhǽhǽjǽ:	ìhǽhǽjǽ: ì:dʒ	‘(my) red ant’

While many final nasal vowels block deletion or assimilation, some final nasal vowels do undergo deletion or assimilation just like final oral vowels. Note however that the nasality of the vowel seems to be retained. There may be independent explanations for these deletions and assimilations. For example, assimilation occurs when there is final [ĩ ã], which may indicate that these surface vowels are default interpretations of underlyingly unspecified vowels rather than underlyingly fully specified vowels.

(8)	in isolation	noun + modifier	Gloss
	ě:gǽjì <sup>̀</sup>	ě:gǽjì <sup>̀</sup> :dʒ	‘(my) wasp’
	èkpí <sup>́</sup> í <sup>́</sup>	èkpí <sup>́</sup> í <sup>́</sup> :dʒ	‘(my) ankle bone’

Also, there are some reduplicated forms where the nasal vowel assimilates. Note that in these cases, the vowel also assimilates in nasality, whereas in (8) it retained its nasality even though it assimilated in all other features. Unfortunately, there are currently only a few examples, so a comprehensive analysis remains to be done.

(9)	in isolation	noun + modifier	Gloss
	òrú <sup>́</sup> ú <sup>́</sup>	òrú <sup>́</sup> ú <sup>́</sup> :dʒ	‘(my) thread’
	èhwá <sup>́</sup> hwá <sup>́</sup> :	èhwá <sup>́</sup> hwá <sup>́</sup> :dʒ	‘(my) bush fowl’

With a mixed picture like that, the description and analysis of the data is far from clear. More speakers need to be included in the dataset and natural data in addition to elicited data needs to be consulted. What is clear however is that there are final nasal vowels in Ikaan, that their phonological behaviour differs from final oral vowels, and that at least on the surface the final nasal vowels are not followed by final nasal consonants.

### 3.2 Final /n/

Word-final /n/ occurs with nouns, verbs, adjectives and different types of pronouns. There is no restriction to the distribution of final /n/. All vowel qualities occur before /n/, and all high, low and downstep high tones are attested before final /n/. For examples of the data, see the recordings and transcriptions in the dataset *ikaan245*.

Final /n/ is affected by phonological processes like every regular Ikaan consonant. In phrase-final position, /n/ tends to surface and be pronounced by most speakers. Before words beginning with consonants, final /n/ also surfaces and is pronounced. Just like with other regular consonants in the language, an epenthetic vowel is inserted between

/n/ and the following consonant to avoid CC sequences. Examples for this are shown in (10).

- (10) òhún            ‘tree’  
       òhún ò:dʒ      ‘my tree’  
       òhún ú nò:     ‘this tree’

There is some degree of variation between speakers and within speakers regarding final and medial /n/.

Some speakers consistently pronounce final /n/, e.g. the speaker in dataset *ikaan245* used here. Other speakers show more variation. For instance, the second speaker in dataset *ikaan001\_walds* (available from the corpus) at times seems to delete the final /n/ and nasalise the preceding vowel instead. An example of this is òhún ‘tree, wood’, which he pronounces [òhúñ] at times, nasalising the vowel and deleting the /n/. In the same recording, the first speaker pronounces /n/ and does not nasalise the vowel more than would be expected as a phonetic co-articulation effect in the context of a nasal consonant, i.e. òhún [òhún ~ òhúñ] ‘tree, wood’.

Participant observation has shown instances of intervocalic n-deletion, e.g. for *mánà* ‘you (pl.)’ or *kénè* ‘do’. It is not yet clear whether n-deletion in this context leads to vowel nasalisation. More work on the corpus needs to be done to follow up this data. However, if there is variation between *mánà* ~ *máã* ‘you (pl.)’, this would be synchronic evidence for the kind of variation that may give rise to nasal vowels, as suggested by Williamson (1973).

### 3.3 Final /m/

Word-final /m/ occurs with nouns and nominalisations, verbs and with pronouns. As shown in more detail below, there is no restriction to the distribution of final /m/. Like with /n/, almost all vowel qualities occur before /m/, and all high, low and downstep high tones are attested before final /m/. For examples of the data, see the recordings and transcriptions in the dataset *ikaan243*.

For now, the Ikaan corpus only contains six m-final verbs. Since this is a very small dataset and since the patterns in the six verbs do not contradict the patterns that have been found for nouns, the following discussion of final /m/ will be restricted to nouns.

As mentioned above, phrase-final /m/ tends not to surface and not to be pronounced<sup>3</sup>. Similarly, /m/ before words beginning with consonants does not surface and is not

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<sup>3</sup> Anaphoric demonstratives are also m-final. In these demonstratives the final /m/ is not deleted and surfaces all the time. It is not yet clear what the explanation for this is. It may be that /m/ is required as weight to make up the minimal word (see below), or that there would be ambiguity between anaphoric demonstratives and proximal demonstratives if /m/ was deleted, and that either of these constraints blocks /m/ deletion for this particular set of words.



pronounced. Final /m/ is only pronounced if it is followed by a vowel-initial word in the same phrase. Examples for all three contexts are given in (11).

(11)	underlying	òkpódùm	‘navel’
	phrase-final	òkpódù	‘navel’
	before consonants	òkpódù ǹ:	‘this navel’
	before vowels	òkpódùm ò:dʒ	‘my navel’

This /m/ deletion contrasts with the processes applying to /n/ as shown in (10), where /n/ surfaces phrase-finally and triggers vowel epenthesis before consonants. Both vowel epenthesis and m-deletion can be argued to work towards avoiding adjacent identical segment types, but /m/ and /n/ employ different strategies to repair the violation.

As mentioned above, m-deletion is an exceptional pattern for Ikaan consonants. Deletion in phrase-final position is unique to /m/, no other Ikaan consonant deletes in that context. Deletion before consonants is also rare, but also occurs with /g/ as shown in (12).

(12)	ìwág	‘year’
	ìwá d̀:	‘this year’

The presence of final /m/ cannot be predicted from the context. M-final words in Ikaan can be preceded by both oral and nasal vowels<sup>4</sup>. The last syllable in which /m/ is in coda position can bear a H tonal pattern, a L tonal pattern or a HL tonal pattern. However, no LH tonal patterns are attested. The following examples show m-final nouns where /m/ is preceded by oral vowels bearing different tones in (13), and by nasal vowels bearing different tones in (14). Because neighbouring nasal consonants can have an additional phonetic nasalization effect, words where the final syllable begins with a nasal are listed separately in (15).

(13)	Tone	Ikaan <i>phrase-final</i>	Ikaan <i>noun + 1SG.POSS</i>	Gloss
	H	òjí àjí	òjím ò:dʒ àjím òjíd	‘(my) friend’ ‘roots (of the palm tree)’
	L	òkpódù ĩᵛ̀àj̀d̀	òkpódùm ò:dʒ ĩᵛ̀àj̀d̀m ò:dʒ	‘(my) navel’ ‘(my) God’

<sup>4</sup> That being said, there are vowels in Ikaan that are clearly oral, vowels that are strongly nasal, and vowels that occur before or after nasal consonants that are slightly nasal. In the current analysis, nasality on vowels is contrastive before oral as well as nasal consonants. However, phonologically oral vowels before or after nasal consonants may sound slightly nasal phonetically, which is explained by phonetic co-articulation effects rather than a phonological features or process.

(13)	Tone	Ikaan	Ikaan	Gloss
	HL	èwàgí	èwàgím è:dʒ	‘(my) crocodile’
(14)	Tone	Ikaan <i>phrase-final</i>	Ikaan <i>noun + 1SG.POSS</i>	Gloss
	H	èrágǔ ìjǔ ìkàhǔ ùrágǔ	èrágǔm è:dʒ ìjǔm ì:dʒ ìkàhǔm ì:dʒ ùrágǔm ù:dʒ	‘(my) sheep’ ‘(my) head’ ‘(my) kitchen’ ‘(my) (species of) fish’
	L	ðkórǒ ùwǒ òrǔ ìhúrǔ	ðkórǒm ò:dʒ ùwǒm ù:dʒ òrǔm èwí ìhúrǔm ì:dʒ	‘(my) nose’ ‘(my) thing’ ‘tail (of the goat)’ ‘(my) knee’
	HL	èkpô èdô èkâ ùkâ àrâ	èkpôm è:dʒ èdôm è:dʒ èkâm è:dʒ ùkâm àgúgúfê àrâm à:dʒ	‘(my) stone’ ‘(my) frog’ ‘(my) bird’ ‘(cassava) flour’ ‘(my) sand, ground’
(15)	Tone	Ikaan <i>phrase-final</i>	Ikaan <i>noun + 1SG.POSS</i>	Gloss
	H	ènó ‘ín’ó	ènóm è:dʒ ‘ín’óm î:dʒ	‘(my) meat’ ‘(my) matter’

A few observations can be made for m-final nouns. Firstly, while oral vowels do occur before /m/, there are fewer words with oral vowels preceding word-final /m/ than there are words with nasal vowels. Secondly, there are a few vowels that are not attested before /m/. The vowels /i ɪ/ only occur as oral vowels before word-final /m/ even though there are nasal /ĩ ĩ/ in the language. The vowel /ã/ only occurs as a nasal vowel before word-final /m/ even though there is oral /a/ in the language. The mid front vowels /e ɛ ẽ ẽ/ do not occur at all before word-final /m/. Thirdly, there are some tonal co-occurrence patterns. When /ã/ occurs, it is invariably with a HL tonal melody. H-only melodies only occur with high vowels /i ỹ/. Since the corpus is still relatively small, it is quite possible that these are gaps due to lack of data. As research goes on, some of these gaps are likely to be filled, though further research should bear these patterns in mind and should specifically follow them up.

As with /n/, there is some degree of variation with /m/. An example with variation in the presence and absence of final /m/ is given in (16).

- (16) òjĩ                    ‘tooth’  
       òjĩ ò:dʒ            ‘my tooth’
- àjĩ                    ‘teeth’  
       àjĩm à:dʒ        ‘my teeth’ (first repetition)  
       àjà:dʒ            ‘my teeth’ (second repetition)

In the singular form, there is no final /m/. Both the final nasal vowel of the first word and the initial oral vowel of the second word appear in the surface form, so the word behaves like a nasal-vowel-final word where the final nasal vowel does not assimilate. In the plural form, the speaker pronounces a final /m/ in the first repetition. Then he hesitates and does not pronounce a final /m/ in the second repetition. However, this time he assimilates the final vowel to the initial vowel in all features except nasality, so behaves differently from the pattern in the singular form.

It is possible that the three patterns indicate a change in the language. Maybe a word such as ‘tooth’, which probably does not occur very frequently, is in the process of losing the final /m/. At the same time, it is important to bear in mind that the elicitation situation in which this data was collected is highly artificial. The speaker’s attention may have been very much on final /m/, final /n/ and final nasal vowels. This could have influenced the way the speaker thought about and said the phrases. It is therefore important to note this variation, but to test it against more speakers, more contexts, and in particular to verify the findings with material from a natural speech corpus. While there is a natural speech corpus for Ikaan, it is beyond the scope of this work to include this next step.

Finally, it is not just in the phonological processes that /m/ is different from other consonants. There is another way in which /m/ differs from other consonants, and that is that most likely /m/ in coda position has moraic weight. It appears that the minimal word in Ikaan has to be bimoraic<sup>5</sup>. Since most Ikaan words consist of a root prefixed with a vowel they automatically have two moras. There are, however, demonstratives which lack a prefix, and there are possessive pronouns where the root has no vowel and consists only of a consonant. These words would fail to meet the two-mora requirement for the minimal word. In these instances, however, the one remaining vowel surfaces as a long and therefore bimoraic vowel, be it the root vowel as in (17) or the prefix vowel as in (18).

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<sup>5</sup> Bare second person singular imperatives of CV verbs with short vowels such as *jé* ‘Eat!’ are not bimoraic but monomoraic and therefore would not satisfy the minimal word constraint. In all other verb forms however, the verb root is preceded by a subject agreement marker which is at least monomoraic, e.g. *òjé* ‘s/he eats’, so that the minimal word constraint would be satisfied again. Therefore, the bare imperative is either an exception to the minimal word constraint, or the minimal word constraint as expressed here is wrong.

- |      |                                   |              |   |
|------|-----------------------------------|--------------|---|
| (17) | demonstrative pronouns            | nò:<br>ʔnó:n | ‘this’ (proximal, class 6)<br>‘that’ (distal, class 6)        |
|      | <i>vs.</i><br>specific determiner | ònón         | ‘the very’ (class 6)  |
| (18) | possessive pronouns               | ò:dʒ<br>ǎ:n  | ‘my’ (classes 1 and 6)<br>‘his, her’ (classes 1 and 6)        |
|      | <i>vs.</i>                        | òrò<br>òmán  | ‘your (sg., classes 1 and 6)<br>‘your’ (pl., classes 1 and 6) |

Diachronically, the long vowels may be explained as compensatory lengthening to ensure that the requirement for the minimal word is met. Synchronically, the vowel lengthening does not seem to be productive anymore and has instead lexicalised into words with bimoraic vowels.

Like all demonstratives, anaphoric demonstrative pronouns have lost the agreement-marking prefix. However, with the exception of jò:m ‘that/who’, their monosyllabic roots are not lengthened, as shown in (19).

- |      |   |  |
|------|---|--|
| (19) | jò:m<br>dàm<br>dòm<br>dèm<br>nèm<br>nòm | ‘that/who’ (anaphoric, class 1)<br>‘those’ (anaphoric, class 2)<br>‘that’ (anaphoric, class 3)<br>‘that, those’ (anaphoric, class 4)<br>‘that’ (anaphoric, class 5)<br>‘that’ (anaphoric, class 6) |
|------|---|--|

This may indicate that /m/ does indeed contribute to moraic weight, whereas /n/ cannot, as shown in the third person singular possessive pronoun in (18). It is not clear why the two nasals show different behaviour in the same position. However, the different moraic behaviour at least correlates with the different consonant deletion vs. vowel epenthesis behaviour. In both cases, the two nasals do not behave alike.

#### 4 Comparisons with other languages

As final /m/ in Ikaan shows such unusual behaviour, this section compares data from Ikaan to other languages to see where there are similarities and differences that might shed light on Ikaan. The reasons for a historical linguistic angle are twofold. On the one hand, it would be interesting to find out where the final /m/ and its unusual behaviour come from. On the other hand, previous research on Ukaan and its lects has mostly been on classification of the language within the Benue-Congo family, and data from final /m/ might help shed some new light on existing qualifications.

First, underlying final /m/ in Ikaan is compared to underlying final nasals in Oko, a Benue-Congo isolate language that is geographically close to the Ukaan lects. What is

interesting about Oko is that final nasals in this language show similar phonological behaviour to final nasals in Ikaan.

Second, words that underlyingly end in /m/ are compared to potential cognates in Edoid languages. This is because Elugbe (2001; 2011; 2012) and other authors have suggested that Ukaan is related to Edoid languages, so one would expect similarities between Ukaan and Edoid.

Third, m-final Ikaan words are compared to resemblances in Proto Lower Cross and Proto Grassfields Bantu because Connell (1998) has observed regular correspondences between Proto Lower Cross and Ukaan for other sounds and because Proto Grassfields Bantu shows many examples with final nasal consonants. It would be interesting if the Proto Lower Cross correspondences identified by Connell could be extended to final /m/ and linked to Proto Grassfields Bantu correspondences.

It is important to acknowledge that when comparing reconstructions, it would be good practice to compare Proto Ukaan forms derived from all four Ukaan lects to proto forms from other languages. While Abiodun (1999) reconstructs Proto Ukaan, there is too wide a range of proto forms to consider reconstructions of words with final /m/ reliable. In Abiodun's (1999) Proto Ukaan reconstructions for m-final words in (20), there are proto forms with no coda and as well as proto forms with final /m̃ mV ñ ù C̃/.

(20)	Reconstruction	Ikaan	Proto Ukaan (Abiodun 1999)	English gloss
	no final C	mĩ:m <sup>6</sup>	*mĩ	'swallow'
		è-ṙágúm	*èràjágú	'sheep'
		ò-kóṙòṁ	*òkóṙò	'nose'
		à-tìṁ	*àtì	'back'
		ò-kpódùṁ	*òkpódù	'navel'
	m̃	ì-jím	*òjím̃	'root'
		ì-húrùm	*ìhúrùm̃	'knee'
		ì-ṙúm	*ìṙúm̃	'head'
		è-nóm	*ènóm̃	'meat'
		ò-rùm	*òdhùm̃	'tail'
	mV	ò-jím	*òjímV	'friend'
		jogum	*jógúmV	'open'
	other	è-kâm	*èCékàjàñ	'bird'
		ùṙùm	*òrùhù	'work'
		è-kpôm	*èk <sup>w</sup> óCòhù	'stone'

<sup>6</sup> There is no tone marking on this word because verbs are underlyingly toneless and receive their tones from tense-aspect-mood inflectional tonal melodies. In quotation form here, verbs are therefore given toneless.

(20)	Reconstruction	Ikaan	Proto Ukaan	English gloss
		è-dòm	*èdúCù	‘frog’, ‘toad’

As more in-depth work on reconstruction of m-final words needs to be done, Ikaan forms will be used for the comparisons here. Moreover, lookalikes will be used rather than true cognates arrived at by the comparative method, as should be done for a true comparative study. The reason for using lookalikes is that the purpose of this paper is to show Ikaan data, and the purpose of this section is to show in how far Ikaan might be relevant or interesting in the wider context.

#### 4.1 Final nasal consonants in Oko

Oko is described by Atoyebi (2009) as having seven oral vowels /i u e ε ɔ o a/ and seven nasal vowels /ĩ ũ ẽ ẽ̃ õ õ̃ ã/. Like in Ikaan, oral vowels occur in any position whereas nasal vowels cannot occur word-initially. In addition to their different distribution, oral and nasal vowels behave differently at phrase boundaries. Whereas final oral vowels are deleted in such contexts, final nasal vowels surface as  $\tilde{V}N$  sequences, as shown in (21). The nasality of the vowel can therefore be predicted from the presence of the underlying final nasal.

(21)	úbárè	+	ófú	→	úbáròfú
	‘back’		‘bone’		‘spine’
	óbí	+	ūtù	→	óbínūtù
	‘king’		‘abode’		‘palace’

The place of articulation of the nasal consonant is also predictable. The [–back] vowels [ĩ ẽ ẽ̃] in (22) always trigger an alveolar nasal, whereas the [+back] vowel [õ] in (23) always triggers a bilabial nasal.

(22)	dzí	+	údzú	→	dzín údzú
	‘open’		‘door’		‘open a door’
	ógbé	+	òfòrò	→	ógbén òfòrò
	‘child’		‘man’		‘boy’
	émé	+	íbé	→	émén íbé
	‘bush’		‘interior’		‘inside the bush’
(23)	fó	+	ìgàlà	→	fòm ìgàlà
	‘to pound’		‘yam’		‘to pound yam’

The [+back] vowels [ũ õ] and the central vowel [ã] trigger [n] if the onset consonant of the syllable is bilabial as in (24), and [m] if the onset consonant is not bilabial as in (25).

(24)	úmú 'goat'	+	èbè 'INDF.PL'	→	úmún ébè 'some goats'
	ámó 'oil'	+	àjē 'DEF.SG'	→	ámón àjē 'the oil'
	épá 'head'	+	ófú 'bone'	→	épán ófū 'skull'
(25)	útú 'work'	+	èfà 'place'	→	útúm èfà 'office'
	fǎ 'enter'	+	ikērēsē 'vehicle'	→	fǎm ikērēsē 'board a vehicle'
	gá 'read'	+	ìwē 'book'	→	gám íwē 'read a book'

Oko and Ikaan have in common that both have underlying final nasal consonants that do not surface if the nasal is in final position but that do surface if there is a vowel-initial word immediately following. Oko and Ikaan differ in that in Oko it is predictable whether or not there is an underlying nasal, and it is predictable which nasal will surface. In Ikaan, the presence of the underlying final nasal is not predictable, and it is only /m/ that shows alternation, /n/ does not.

#### 4.2 Final nasal consonants in Edoid

Abesabesi/Akpes, the immediate geographic neighbour of Ikaan, is argued to be an Edoid language (Agoyi 2012; 2001) and also argued to be related to Ikaan. In the data in Ibrahim-Arirabiyi (1989), there are indeed some striking similarities between the two languages, and there is dialect variation in Abesabesi/Akpes that shows some degree of alternation between VN,  $\tilde{V}N$  and  $\tilde{V}$  sequences. The data in (26) shows the forms in Ikaan and in the various Abesabesi/Akpes lects.

(26)	Lect	‘send’	‘work’	‘meat’	‘head’	‘sheep’
	Ikaan	rũm	ùrũm	ènóm	ìfúm	èràgúm
	Ase	sōm	ìsũm	énám	ìsùm	ēsāgūm
	Akunnu	sōm	ìnsùm	ènó	ìt̥fùm	ēsām
	Ikaram	sōm	ìsùm	ēnām	it̥fūm	ēsāgūm
	Gedegede	sómú	ìsùm	énām	ít̥fúm	èsàgùm
	Ibaram	sómū	ìsũ	énám	it̥fūm	èsàkùmì
	Daja (Ajowa)	sō	ùsù	ēnā	ūsū	ìsāgūn
	Esuku (Ajowa)	sómū	ìsúmú	ènóm	ìfūn	ēsāgúm
	Akunnu (Ajowa)	sōm	ìnsùm	ēnām	ít̥fúm	ésás

However, there are also many m-final Ikaan words and many other basic lexical items that do not resemble Abesabesi/Akpes at all. This raises the question whether the similar-looking words above are perhaps borrowed rather than inherited. For now, there is not enough data nor is there an established methodology for telling ancient borrowings from inheritance so that this question will be left unanswered here.

Proto Edoid as reconstructed in Elugbe (1989) also has correspondences with Ikaan words that initially seem striking, as shown in (27). If Ikaan is indeed related to Proto Edoid, underlying final /m/ in Ikaan might be a reflex of Proto Edoid \*mh. However, there are only very few examples. Moreover, correspondences with \*N might also occur. Finally, if Proto Edoid \*U-tò ‘ground’ is related to Ikaan ù-râm ‘ground, sand’, Ikaan would have innovated a word-final /m/ that did not exist in Proto Edoid. At the least, this rather mixed picture shows that the proposed relationship between Ikaan and Proto Edoid needs to be shown more clearly for m-final words before it can be accepted.

(27)	Correspondence	Ikaan	Proto Edoid	Gloss
	m ~ *mh	ò-rùm	*U-thiəmhi	‘tail’
		è-nóm	*E-nhamhi	‘meat, animal’
		ì-fúm	*U-chiəmhi	‘head’
	m ~ *N	mĩ:m	*dhɔNi	‘swallow’
		ò-kóròm	*I-chuveNi	‘nose’
	m ~ Ø	ù-râm	*U-tò	‘ground’

### 4.3 Final nasal consonants in Proto Lower Cross and Proto Grassfields Bantu

When Ikaan is compared to Proto Lower Cross (PLC, data from Connell 1998) and Proto Grassfields Bantu (PGB, data from Hyman 2007), more resemblances come up than in the comparison with Proto Edoid. There are quite a few examples where Ikaan /m/ seems to correspond directly to Proto Lower Cross \*m. However, again there are also examples for correspondences with other nasals, here \*n and \*ŋ. Where Proto



Lower Cross and Ikaan have *m*/*\*m*, Proto Grassfields Bantu also has quite a few potential lookalikes, mostly with *\*m* but also possibly with *\*n* or *\*ŋ*.

(28) Correspondence	Ikaan	PLC	PGB	Gloss
<i>m</i> ~ <i>*m</i> ~ <i>*m</i> ( <i>*n</i> , <i>*ŋ</i> )	[*jóm(V)]	*lóm	*lúm	‘bite’
	è-nóm	*ú-nàm	*nàm`	‘meat, animal’
<i>m</i> ~ <i>*n</i> ~ Ø, <i>*l</i>	à-tìm	*è-dèm	*jìm	‘back’
	ù-rôm	*ú-tóm	*túm`	‘work, message’
	ò-rùm	*ù-sìm	*kùn`/*sáj`	‘tail’
	è-wàgîm	*ò-fîjèm	[no data]	‘crocodile’
<i>m</i> ~ <i>*ŋ</i> ~ Ø	mĩ:m	*mèn	*mĩ(l)	‘swallow’
	à-râm	*ń-tán	[no data]	‘sand’
<i>m</i> ~ <i>ŋ</i>	ù-râm	*í-sòŋ	*sé	‘ground’
	è-dôm	è-dóŋ (Efik) è-dôŋ (ItuMbuso)	[no data]	‘frog’

The data from Proto Lower Cross and Proto Grassfields Bantu show more correspondences between Ikaan and Proto Lower Cross/Proto Grassfields Bantu than between Ikaan and Proto Edoid. It also shows no similarities that Ikaan and Edoid share to the exclusion of Proto Lower Cross. If this holds in a comparative analysis, the data is challenging for a subgrouping of Ukaan with Edoid as proposed by Elugbe (2001; 2011; 2012).

## 5 Discussion and conclusion

This paper has looked at final nasal vowels and consonants in Ikaan, showing their forms, their distribution, the phonological processes they undergo and variation that has been observed. The data has shown that final nasal vowels are interesting because their distribution and behaviour patterns differ from that of oral vowels. The final nasal consonants are interesting because there is asymmetry in phonological behaviour within the group. Final /*m*/ in particular is interesting because /*m*/ stands out from all other Ikaan consonants both in terms of its phonological behaviour and in terms of its moraic weight.

Going back to Ferguson’s (1966), Greenberg’s (1966) and Stahlke’s (1971) proposals that nasal vowels come from CVN sequences, Hyman (1972) discussed that distribution, alternations and variation evidence should lend support this hypothesis. Section 2.1 showed that Ikaan nasal vowels do have a restricted distribution. At the same time however, there are both nasal vowels and nasal consonants in word-final position, which should be ruled out by a CVN > CŨN > CŨ hypothesis. Section 3.3

showed alternations where final /m/ only surfaced if it was followed by a vowel-initial word, similar to the French example Hyman gave. However, unlike in the French example there was no de-nasalisation once /m/ surfaced. Sections 3.2 and 3.3 showed initial observations on variation between speakers and within the same speaker that might be indicative of different steps in a change in the language. A comparison between lects is not yet possible because reliable data from the other Ukaan lects is not available. Overall, the Ikaan data does seem to lend some weight to a CVN hypothesis. Still, research on the nasal vowels in particular is only just beginning, variation between and within speakers needs to be explored more and of course other hypotheses apart from CVN need to be tested and evaluated before a well-founded conclusion can be drawn.

In the comparison with other languages, similarities and differences between underlying final nasal consonants in Ikaan and Oko have been outlined. The comparison between the two languages deserves more attention in the future because of the similarities and subtle differences in the data, because of the geographic proximity of the speaker communities, and because like Oko, Ukaan may well be another isolate within Benue-Congo and as such may hold valuable information for the history of the language family.

The comparison with Edoid and Proto Lower Cross had the discussion on the phylogenetic classification of Ukaan in mind. Previous classifications have suffered from lack of data in general and from lack of data beyond wordlists in particular. As the deletion of final /m/ in phrase-final position has shown, wordlists simply cannot indicate the presence of final /m/. As a result, m-final words and their potential relevance for subgrouping within Benue-Congo would necessarily have been missed by previous work. With the knowledge of final /m/, sections 4.2 and 4.3 showed resemblances in Edoid as well as in Proto Lower Cross/Proto Grassfields Bantu. In the comparisons, Proto Lower Cross/Proto Grassfields Bantu showed similarities that are difficult to explain with a subgrouping of Ukaan with Edoid languages and therefore added a puzzle that needs to be accounted for before a special relationship of Ukaan and Edoid can be accepted.

Small languages such as Ikaan and Oko hold interesting data. This data may well be hidden in underlying forms. Wordlist surveys as done in previous work on Ikaan are not suited to spotting such data. What is needed instead is in-depth research such as long-term documentary and descriptive work that takes into consideration the whole language system as well as the sociolinguistic and historic context in which the language is spoken. Over time, this may yield well-understood and well-contextualised data that will aid in conducting a well-grounded comparative historical description and analysis of final nasal vowels and consonants across West Africa, and may eventually help us understand how nasal vowels have arisen and how they have developed into the various systems of contrast that exist today.

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### Transcription conventions and abbreviations

Interlinear glossing follows the Leipzig Glossing Rules (Comrie et al. 2004). The following abbreviations and transcriptions have been used:

C	consonant	`	low tone, as in [à]
N	nasal consonant	↓	downstep
V	vowel	1, 2, 3	1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> person
Ñ	nasal vowel	SG	singular
:	long, as in [a:]	PL	plural
.	syllable boundary	POSS	possessive pronoun
*	proto form	DEF	definite
ˊ	high tone, as in [á]	INDF	indefinite
-	mid tone, as in [ā]		

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### Appendix

There are three data sets published together with the article. All three data sets consist of an audio recording and a time-aligned transcription and annotation in the original .eaf format produced by ELAN, the annotation software, and in .txt and .pdf format for reader friendliness. Descriptive metadata for all three data sets is given below.

<b>Bundle</b>	<b>ikaan243</b>
Title	m-final words for historical and comparative linguistic work
Files	ikaan243.wav, ikaan243.eaf, ikaan243.txt, ikaan243.pdf
Status	stable
Access	open access, available under license Creative Commons Attribution Non-commercial No Derivatives
Description	The audio recording investigates words that underlyingly end in /m/ and gives the word in a context where the underlying /m/ is not pronounced and in another context where /m/ is pronounced. The specific research interest is on which tonal patterns can be on the last syllable and whether the vowel preceding the /m/ is nasalised or not. The annotation gives a time-aligned phonemic transcription, a free translation into English and comments. Some words in the recording turned out not to be m-final. This was noted for each of those words in the comments. Special attention was paid to the nasality and tones of the vowel preceding the underlying /m/.
Language	Ikaan (kcf, Ikakumo, Ondo State, Nigeria)
Creator	Sophie Salfner
Speaker	Fred Adekanye
Date created	11 June 2012
Location	Parlour of Festus Obaude's house, Ikakumo, Ondo State, Nigeria
Note	I specifically observed the speaker to see whether he closed his lips to pronounce the final /m/, even if he pronounced it silently, and there was no lip closure.
<b>Bundle</b>	<b>ikaan244</b>
Title	Words ending in nasal vowels for historical and comparative linguistic work

Files	ikaan244.wav, ikaan244.eaf, ikaan244.txt, ikaan244.pdf
Status	stable
Access	open access, available under license Creative Commons Attribution Non-commercial No Derivatives
Description	The audio recording investigates words that end in nasal vowels and gives each word in its citation form and in a phrase where the word is followed by the word 'my'. The specific research interest is whether nasal vowels assimilate to the following vowel in the next word like oral vowels or whether they remain. The annotation gives a time-aligned phonemic transcription, a free translation into English and comments.
Language	Ikaan (kcf, Ikakumo, Ondo State, Nigeria)
Creator	Sophie Salfner
Speaker	Fred Adekanye
Date created	11 June 2012
Location	Parlour of Festus Obaude's house, Ikakumo, Ondo State, Nigeria

**Bundle**      **ikaan245**

Title	n-final words for historical and comparative linguistic work
Files	ikaan245.wav, ikaan245.eaf, ikaan245.txt, ikaan245.pdf
Status	stable
Access	open access, available under license Creative Commons Attribution Non-commercial No Derivatives
Description	The audio recording investigates words that end in /n/. The specific research interest is on whether the /n/ is pronounced or whether it can be deleted and only retained as nasalisation. The annotation gives a time-aligned phonemic transcription, a free translation into English and comments.
Language	Ikaan (kcf, Ikakumo, Ondo State, Nigeria)
Creator	Sophie Salfner
Speaker	Fred Adekanye
Date created	11 June 2012
Location	Parlour of Festus Obaude's house, Ikakumo, Ondo State, Nigeria