The linguistic encoding of landscape in Lokono
Rybka, K.A.
4. Landform terminology

Although landscape is fundamental to human experience, landscape terminology is still a fairly understudied phenomenon in linguistics. The study of place names, which are one system of landscape categorization, and frames of reference abstracted from geographic features are notable exceptions, but there is more to landscape than that (Basso 1996; Brown 1983; Hunn 1996; Kari 1989; Langendonck 2007; León 1994; Levinson 2003; Mithun 1984). Recent studies of the linguistic encoding of landscape in a number of genetically and areally distant languages have explored a number of landscape categorization systems. This line of research has stimulated a discussion about the linguistic, utilitarian, and geophysical factors shaping the language-specific organization of the landscape domain, as well as the possible cross-linguistic common denominators within it, and the relation between proper place names and generic landscape terms as different systems of landscape categorization (Bohnemeyer et al. 2004, Brown 2008, Burenhult 2008b, Derungs et al. 2013, Johnson and Hunn 2012a, Kathage 2005, Mark and Turk 2003, Nash and Simpson 2011, O’Meara 2010, Senft 2008, Whitley 2011).

This chapter falls within the broader discipline of ethnophysiography (Mark and Turk 2003). It focuses on landform terms, defined as generic expressions referring to land surface forms (e.g., convex, concave, and horizontal landforms). This study explores the domain of landforms in Lokono, an Arawakan language of the Guianas. I demonstrate that the expression of landforms in Lokono relies heavily on the single set noun horhorho ‘landform’, which is transnumeral, insensitive to scale and unspecified for shape. It can be used on its own or in phrases with relational and configurational nouns that specify a part or a configuration thereof, respectively. The landform domain is therefore based on partonymic (relational phrases) and spatial relations (configurational phrases). Moreover, landform terms are grammatically grouped together with other nouns denoting places (where-nouns), as opposed to nouns denoting objects (what-nouns). Lokono landform subdomain is better represented in a field-based model—as a function of horhorho with values from the set of the relational and configurational nouns. The system as a whole is insensitive to vegetation, at least partly insensitive to scale, and most likely

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indifferent to material (but see the discussion of vegetation-based landscape features in chapter 5—a subdomain in which water saturation may play a role). As such, this study is an ethnolinguistic exploration of concepts central to geomorphology (Ahnert 1998:1; Summerfield 1991:3).

Burenhult and Levinson (2008:137), in their demonstration of the importance of landscape for linguistics, mention that the surface of the Earth can be thought of as a largely continuous terrain. Such models pervade geographic studies, which often operationalize land surface as a function of a horizontal position varied by an attribute such as slope or elevation. Conceptualizations of this type are called field-based (Cova and Goodchild 2002; Goodchild, Yuan, and Cova 2007; Mark 1975; Moore, Grayson, and Ladson 1991; Weibel and Heller 1991). They represent geographical phenomena as a spatial distribution of attributes (e.g., elevation or slope). However, widespread as field-based conceptualizations may be in geography, it has been said that they do not reflect the way humans conceptualize geographic features.

Smith and Mark (2003:419) claim that within folk systems of categorization object-based conceptualizations dominate (Smith and Mark 1998; Smith and Varzi 2000). In an object-based conceptualization, discrete objects (e.g., landforms such as those labeled by the English nouns mountain and valley) are identified in space. The object-based model is common among laypeople, as well as social scientists, and geomorphology professionals (Straumann 2010:59–60). Burenhult and Levinson (2008:137) share this view, and say that the potentially continuous land surface is segmented into quasi-objects at the level of mental constructs we operate with. The term “quasi” is applied because such entities differ from other objects in that their demarcation does not exist independently of human cognition. Compare, for instance, a chair, an object with genuine boundaries, and a mountain, an object with fuzzy boundaries dependent on our idea thereof (Dehn, Gärtner, and Dikau 2001; Smith 2001).

That landforms are a special category of objects is an idea that echoes in semantic theory as well. Lyons (1977:422) distinguishes the category of first-order entities, defined as discrete, moveable entities with perceptual boundaries—for example cat, chair, table. This type of real world entities in Lyons’ theory is expressed in language by first-order nouns. When mentioning landscape elements, including landforms, Lyons points out their “intermediate” status. Unfortunately, he does not discuss what “intermediate” really means in this context. He later calls them place-referring nouns, suggesting that, at least in English, they oscillate between first-order nouns and adverbials such as here and there. Indeed, recent studies show that landform expressions can depart from first-order nouns in their morphosyntactic behavior—a topic further developed in this chapter (Cablitz 2008, Huber 2014, Rybka 2014b).

The idea that landforms are intermediate first-order entities renders their linguistic expression an interesting domain for the study of linguistic variation and language universals, as well as for the study of the relations between language, cognition, culture, and the geophysical world. Moreover, landforms can be expressed by various linguistic means (e.g., nouns or verbs, simplex or complex). Different geophysical parameters may be important for the classification of landforms in a language (e.g., shape, material, vegetation). They may also differ
with respect to their cultural significance (e.g., for subsistence practices, beliefs). Furthermore, landform terms can be organized as a domain in terms of various types of relations (e.g., taxonomic, partonymic, spatial). Finally, the language-specific concepts of landforms can shed light on the existing models of representation used in geography. In the remainder of this chapter, I give an account of the linguistic encoding of landforms in Lokono. I first sketch the sociocultural background of the speakers, and comment on the geophysical characteristics of the local landscape (§§ 4.1 and 4.2, respectively). Subsequently, I describe the methodology and present the grammatical phenomena relevant to the present analysis—the features of relational and configurational nouns, and the grammatical distinction between what-nouns and where-nouns (§§ 4.3 and 4.4, respectively). I then discuss the linguistic characteristics of simplex and complex landform expressions, and show that they belong to the where-category, members of which denote places, not objects (§ 4.5). Finally, I summarize the results, and demonstrate that the Lokono concept of topography is best represented in a field-based model (§4.6).

4.1 Sociocultural background

Traditionally, the Lokono were semi-settled farmers practicing swidden agriculture, fishing, hunting, and gathering. The Lokono practiced village exogamy and lived in matrilocal (and matrilineal) family groups. Spiritually, they had an animistic system of beliefs (Goeje 1942; Renselaar and Voorhoeve 1962; Roth 1915; 1924; 1929). However, the traditional way of life is giving way to modernity of the 21st century. Today, probably half of the Surinamese ethnic Lokono population lives in the capital city Paramaribo and its many suburbs, while the Lokono villages are suffering from depopulation (Kambel and Jong 2006; Molendijk 1992; VIDS 2008). The majority have partly given up the traditional lifestyle, and adapted to the cash economy. Many Lokono people do not depend on agriculture anymore, and therefore no longer migrate in search of fertile grounds. The inhabitants of Cassipora village, where data for this chapter were collected, work in tourism or the mining and logging industry, while still practicing farming on a minor scale. On a daily basis, most Lokono eat rice purchased in the city instead of cassava. Hunting, fishing, and gathering have lost their status as subsistence practices. Matrilocal village exogamy is slowly disappearing, while Catholicism has found fertile grounds, and introduced a patrilineal naming system. Nevertheless, traces of animism are still part of daily life. With most villages being reachable by road, transport by dugout canoes has virtually disappeared in the area.

4.2 Geophysical background

The Lokono people inhabit the northern parts of the Guianas (French Guiana, Suriname, Guyana), including both the coastal urban centers, and the rural villages
scattered throughout the pericoastal savannas. In Figure 4 the location of Cassipora (called Kasuporhi in Lokono), where the data were collected, is given.\textsuperscript{55}

Cassipora village is situated in an area dominated by sandy savannas, dissected by densely forested creek valleys (Figure 5 and Figure 6 below). The drier the soil, the lower and thinner the forest becomes. At the bottom of the valleys, many creeks flow together, forming larger watercourses, which eventually drain to the Suriname River. In the rainy seasons, the creeks inundate the valleys, creating seasonal swamps and distributaries. Annual rainfall averages 2,200 mm, and average temperature oscillates between 26° and 27° C.

\textsuperscript{55} Figure 4 and Figure 7, as well as Figure 16, Figure 17, and Figure 22 below were created using ArcGIS software by Esri; background maps courtesy of Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBASE, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap, and the GIS User Community.
Figure 5.—Photograph of the Cassipora savanna.

Figure 6.—Photograph of the seasonally flooded forest of the Korobali Creek.
Figure 7 shows the Cassipora territory together with the major creeks (dark filled lines) and roads (contour lines). The spaces closer to the creeks are the lower lying areas; generally the further away from the creeks the higher the elevation.

It should be pointed out that the changes in elevation are small (approximately 50 m). Moreover, they are hard to perceive due to vegetation, which significantly limits the scope of view beyond the savanna. The area gives therefore the impression of being flat and devoid of convex landforms. Due to vegetation cover one can rarely see how the higher grounds slope down toward the creeks. It is the tops of these landforms that the Lokono choose as their settlement sites. Rather than being flat, the area is therefore a mirror image of typical land relief the European may be used to: it is not a flat with convexities, but a flat with concavities.

4.2.1 Cultural significance of landscape

The lay of the land is of some importance to Lokono subsistence practices. Certain crops cannot be inundated, while others need a watery soil, and hunting takes place on dry land. Water bodies, nevertheless, seem to play a more important role. The lower lying areas, the seasonally flooded valleys, are home to many species of fish, an important part of the Lokono diet in the past. The domain of hydrological landscape terms shows a higher degree of lexicalization than the domain of landforms described here, which can be a token of its higher salience. A similar conclusion can be drawn from the study of Lokono place names. There are hardly
any place names that do not refer to hydrological features or vegetation stands. Even villages, savannas, and forests are often named after creeks that pass in their vicinity (see chapter 6). No proper place names referring specifically to convex, concave, or horizontal landforms have been attested.

Convex landforms of exposed rock found outside of the immediate Cassipora area, however, do have a special place in the spiritual life of the people. Such rock formations are, for instance, the places where medicinal plants are believed to grow. The ethnographic record shows that such places are believed by the Amerindians of the Guianas to harbor powerful spirits (Roth 1915:235). In the past, strict restrictions were placed on interaction with such landmarks. It was forbidden to point at them, to touch them, or to look at them. It was advisable not to approach them and not to talk about them. Some of these restrictions still apply to stone formations at the Mapana creek, a locality in the periphery of the Cassipora area. Its name is often replaced with an avoidance term Thusakho (lit. ‘It Does Not Name’) in order not to anger the spirit of the place (see also chapter 5 for a discussion of the importance of water spirits). One of the stimuli used in elicitations included a picture of Voltzberg—an example of such a rocky formation, a granite dome of 240 meters, with which some of the speakers were familiar (Figure 8).

Figure 8.—Photograph of Voltzberg, a granite dome in the Coppename river.
4.3 Methodological background

The starting point for this chapter were field sessions on topological relations, using Bowerman and Pederson’s (1992) stimulus (henceforth BOWPED), and elicitation sessions on the expression of motion using Levinson’s (2001) material (henceforth LEV). In order to probe the domain of landforms further, two director-matcher tasks were developed. During these tasks, two consultants were presented with an identical set of stimuli. A curtain separated one consultant from the other, so that they could not see each other’s sets. One consultant, the director, described a chosen item from the set in such a way that the second consultant, the matcher, could identify the same item. The participants were encouraged to talk as much as possible while identifying the pictures. When the task was finished, the consultants switched roles and started again.

In the first task, called Where Is The Tree (WITT), the director and the matcher were given a set of black-and-white drawings representing sketchy landforms with trees in different configurations. Two sets were used, each consisting of six drawings: a set with one landform and one tree, and a set with more than one landform and more trees. The drawings represent landforms in an abstract way. A sample drawing from the set is given in Figure 9.

![Figure 9](image_url)

**Figure 9.—An example drawing from the Where Is The Tree task.**

In the second task, called Mountain Photo Matching (MPM), the participants were given a set of fourteen color photographs of landforms and a few distracter
photographs showing landscape elements from other domains—for instance hydrological features. The stimuli depicted features that were typical of the Surinamese landscape in general, and of the village vicinity in particular, as well as features foreign to the local scenery (e.g., the Alps). The pictures were compiled in order to embody a number of real exemplars of landforms, as opposed to the abstract drawings. An example photograph from the set is given in Figure 10.

Once the linguistic means to talk about landforms were collected and analyzed, a follow-up exercise, called the Landform Coloring Task, was developed. In this task, the speakers were presented with a booklet of thirteen pages each showing an identical drawing of land relief. On each page, a different landform term was written, and within each booklet the order of the pages was randomized. The speakers were asked to color the part of the drawing named by the landform term. The participants had no difficulties with reading the terms on the pages, but to avoid any problems I first read out all the landform terms to make sure the task was clear to the participants. An exemplary page from the Landform Coloring Task is given in Figure 11.
The data from these tasks were complemented with examples from natural discourse, conversations during fieldwalks, narratives, and elicitation sessions collected during several years of fieldwork. Examples taken from my own fieldwork are followed by information concerning the place, year and type of recording (in parentheses). In section 4.4 (Linguistic background) there are also a few short examples without a reference that illustrate simple grammatical features of Lokono nouns and verbs. Examples taken from other sources were adapted to correspond to an orthography chosen by the community (Rybka 2013). The ten consultants, six men and four women, who participated in the director-matcher tasks and the coloring task were native speakers of Lokono, fluent speakers of Sranantongo, and generally less fluent speakers of Dutch. The consultants were between 50 and 80 years old, representing the typical age of the Lokono speakers today. Language contact in today’s Lokono society manifested itself in the data set in the occasional use of the Sranantongo term bergi ‘mountain, hill’—this ad hoc borrowing is not discussed further below.

4.4 Linguistic background

As discussed above, Lokono nouns belong either to the masculine or the feminine agreement class (§ 3.3.1). Masculine gender is in principle restricted to nouns denoting Lokono men. Other nouns normally fall into the feminine gender class (but see chapter 5 for interesting exceptions in the landscape domain). Gender agreement is illustrated in (205) and (206) below.

(205) *li sathi wadili*

\[
\begin{array}{ll}
\text{li} & \text{sa–tʃi} \\
\text{DEM:M} & \text{good–SBJ.REL:M} \\
\text{wad'li} & \text{man} \\
\end{array}
\]

‘the good man’
In (205) and (206) above, gender is marked in two places: by the deictically unmarked demonstratives li and to, functioning as definite articles, and by the subject relativizers –thi and –tho forming equivalents of relative clauses. The distinction is also marked on 3rd person pronouns, 3rd person prefixes, and enclitics, as well as a few other forms.

Lokono nouns are also divided into alienable and inalienable classes, based on their morphological behavior when possessed (§ 3.3.3 above). The former receive a possessive suffix when possessed, as in example (207).

(207) dayoron
    da–yorò–ŋ
    1SG–cassava.press–POSS
    ‘my cassava press’

Irrespective of whether the possessor is expressed by a personal prefix attached to the possessed noun or by a full noun preceding it, the alienable noun yoro ‘cassava press’ is suffixed with a possessive marker. This suffix is absent on inalienable nouns such as khabo ‘hand’ in (208).

(208) dakhabo
    da–k’abo
    1SG–hand
    ‘my hand’

Inalienable nouns do not take the possessive suffix. This class includes kinship terms, relational nouns, including body part terms, configurational nouns expressing notions such as loko ‘inside’, a number of nominalizations, and a few terms for culturally salient artifacts. Moreover, a number of nouns have suppletive possessed forms (e.g., bahu/shikwa ‘house/house.POSS’), while a few nouns denoting unique entities cannot be possessed at all (e.g., hadali ‘sun’).

Lokono nouns can be further subdivided into three groups, namely singular object nouns, set nouns and mass nouns on the basis of their behavior with the exponents of grammatical number (Rijkhoff 2002:54). Singular object nouns such as wadili ‘man’ in (209) combine directly with a free numeral, and are obligatorily marked for number (§ 3.3.2 above).

(209) bian wadilinon
    biāŋ wad’ili–nōŋ
    two man–PL
    ‘two men’
This class includes only person-denoting nouns in Lokono. On the other hand, set nouns such as ada ‘tree’ in (210) can combine directly with a free numeral, but are not marked for number. Set nouns are thus transnumeral.

(210) bian ada
  biǎŋ ada
two  tree
‘two trees’

This class includes terms for animate and most inanimate entities. However, both singular object nouns and set nouns can take the collective suffix –be (e.g., bian wadili(be ‘a group of two men’ or bian adabe ‘a group of two trees’). In addition, there are mass nouns, such as mothoko ‘sand’ in (211).

(211) bian mothoko karo
  biǎŋ moťoko karo
two  sand  grain
‘two grains of sand’

Mass nouns cannot combine directly with a numeral, but require a mensural classifier such as karo ‘grain’, which they form a possessive phrase. Headed by a set noun, such phrases inherit the features of set nouns in quantitative expressions.

In the verbal domain, Lokono shows a split into active and stative predicates (§ 3.4.1). The former denote activities, and are characterized by the possibility of expressing the subject with a personal prefix, as in (212).

(212) Dadukha no.
da–dikh=a=no
1SG.A–see=3Fb
‘I see it/her/them.’

In (212), the active (and transitive) verb dukhun ‘see’ is combined with the 1st person prefix encoding the subject, and followed by the 3rd person enclitic encoding the object. The same prefixes that are used to express the possessor on nouns are used to express the subject on active verbs. Stative verbs, on the other hand, lexicalize states, and can express the subject with the same enclitics that encode the object of transitive verbs.

(213) Semeka no.
seme–ka=no
tasty–PFV=3Fa
‘It is tasty.’

56 Notice that the final vowel of the root can change (e.g., dukha/dukhun). These changes reflect the division of Lokono verbs into four subclasses as well as the vestiges of a realis/irrealis distinction, neither of which is important to the discussion of landforms.
In (213) the subject of the stative verb *semen* ‘tasty’ is expressed by the 3rd person feminine enclitic =*no*, the same form that encoded the object of the transitive verb in (212). Both prefixes and enclitics express person, number (except for 3rd person), and gender (in 3rd person only). The prefixes are preferred to full nouns and free pronouns if the referent is established in discourse.

The verbal paradigm in Lokono is complex, especially on the suffix/enclitic side, with bound forms expressing tense, aspect, and mood (TAM). I describe here only event nominalizations and forms containing the relativizers, which sometimes appear in landform expressions (§§ 3.4.6.4 and 3.4.6.2, respectively). The former take the shape of the verb root suffixed with the event nominalizer –*n*. An example of an event nominalization is given in (214), an utterance from a traditional Lokono folktale.

(214) *To yon landun, lumarihita lubanabowa.*

\[
\begin{array}{llll}
\text{to} & \text{yō–ŋ} & \text{l–andī–ŋ} \\
\text{DEMF} & \text{LOC.ANPH–LOC.WHR} & 3\text{M}_\Lambda–\text{arrive–NMLZ} \\
\text{li–marita} & \text{li–banabo–wa} \\
3\text{M}_\Lambda–\text{make} & 3\text{M}_\Lambda–\text{hut–REFL} \\
\end{array}
\]

‘Having arrived there, he built a hut.’ (Bernharddorp, 2009, traditional story)

Event nominalizations are used as a complementation strategy and appear in various types of dependent clauses as in (214), where the event nominalization *landun* ‘his arriving’ functions as a temporal adverbial clause. Event nominalizations are inalienably possessed; the possessor encodes the referent participating in the event. They retain many verbal features such as the possibility of attaching TAM markers to encode various TAM distinctions.

Many forms can attach the relativizing suffixes –*thi* and –*tho*, masculine and feminine, respectively. Such forms are typically derived from active and stative verbs, but also from nouns. They are used as the equivalents of relative clauses, as in (205) and (206) above, where the forms *sathi* and *satho* derived from the stative verb *san* ‘good’ modify the nouns *wadili* ‘man’ and *hiyaro* ‘woman’, respectively. The forms containing relativizers also retain many verbal features, such as the possibility of attaching TAM markers.

### 4.4.1 Structure of the spatial expression

The discussion of landform terms hinges on the structure of the spatial expression—what I call the directional phrase in chapter 0.\(^{57}\) The Lokono spatial expression can

\(^{57}\)I use the term *spatial* instead of *locative*, since the latter is unfortunate in suggesting the locational directionality only, to the exclusion of goal, source, via, and other secondary directionals. The terms *directionality* and *configuration* are used in keeping with the theory proposed by Lestrade (2010), which builds upon earlier work by Kracht (2002; 2003; 2008). They correspond to the earlier notions of *Path* and *Place* (Jackendoff 1990) or *Vector* and *Conformation* (Talmy 2000).
vary in its complexity. Its full form is exemplified in (215), in which the brackets indicate elements that are not obligatory.

(215) Horhorho (shi) (diako) wâya
hororo (ʃi) (d'ako) wa:ya
landform (head) (top) SRC:TL
‘from (the top of) (the head of) the landform’

The spatial expression contains a Ground-denoting term, which can be a single noun (e.g., horhorho ‘landform’). The Ground-denoting term can form a possessive phrase with a relational noun specifying a part of the Ground (e.g., horhorho shi ‘head of the landform’). Whether simplex or complex the Ground-denoting expression can form a possessive phrase with a configurational noun (e.g., diako ‘top’) specifying the spatial relation (e.g., horhorho shi diako ‘top of the head of the landform’, or horhorho diako ‘top of the landform’). Finally, irrespective of its complexity, the phrase containing the Ground-denoting noun is followed by a directionality marker indicating the type of directionality—that is, how the spatial relation changes over time. Location directionality means no change (static location); goal directionality means change into a new configuration, while source directionality means change out of a configuration. In (215) above the source directionality marker was used (i.e. horhorho shi diako wâya ‘from the top of the head of the landform’). The spatial expression as a whole can function as an adverb to the predicate, as in (216).

(216) Horhorho shi diako wâya thurhibiswa.
hororo shi diako wa:ya thɨ-ɨtɨ-ɨtɨ mibiwa
landform head top SRC:TL 3F_B-roll.REFL
‘It rolled itself from the top of the head of the landform.’

In (216) the spatial expression encoding the source of motion functions as an adverb encoding the source of motion expressed by the reflexive verb rhibisonon ‘roll oneself’. Alternatively, the spatial expression can be part of a stand-alone stative clause expressing the spatial relation between the Figure and the Ground. This is particularly common in the case of location directionality, one exponent of which is illustrated in (217)

(217) Horhorho shi diakonka no.
hororo shi d'akô–ŋ–ka=no
landform head top-LOC.WHR–PFV=3F_B
‘It is at the top of the head of the landform’

The terms Figure and Ground refer to the entity to be located/its location (Talmy 1983), and are equivalent to the more recent Trajector and Landmark (Langacker 1987). The term Ground should not be confused with the noun ground ‘the horizontal level of the land’, which appears in the text as well.
In (217) the location directionality marker –n is used. When part of a stand-alone clause, the spatial expression is followed by a TAM marker (e.g., the perfective suffix –ka), forming a stative predicate. The subject of the predicate, encoding the Figure, can therefore be expressed by the personal enclitics. This schematic structure of the spatial expression is discussed in more detail below.

4.4.1.1 Relational nouns

Relational nouns are an optional element of the spatial expression, specifying the part of the Ground. The group includes mostly body part terms or forms derived from body part terms. However, many of them can be applied to parts of other entities, therefore the term relational noun is more felicitous. A few examples are given in Table 44 (see also section 3.6.5).

<table>
<thead>
<tr>
<th>Form</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>shi</td>
<td>head, top part (e.g., of people, animals, plants, landforms)</td>
</tr>
<tr>
<td>duna</td>
<td>arm, lateral part of entities (e.g., of people, animals, buildings, landforms)</td>
</tr>
<tr>
<td>doko</td>
<td>lap, convex part, bent part (e.g., of people, hammocks, landforms)</td>
</tr>
<tr>
<td>rhebo</td>
<td>edge (e.g., of tables, creeks, forests, savannas, landforms)</td>
</tr>
<tr>
<td>shibo</td>
<td>face, front part (e.g., of people, animals, buildings, landforms)</td>
</tr>
<tr>
<td>debo</td>
<td>part of the body immediately below the waist (e.g., of people, water features)</td>
</tr>
</tbody>
</table>

Relational nouns are inalienably possessed, and form a possessive phrase with the Ground-denoting term (e.g., horhorho boloko ‘tip of the landform’). The Ground can alternatively be expressed by a personal prefix attached to the relational noun. Since we are discussing nouns denoting inanimate entities (i.e. landforms), the 3rd person feminine prefix thu– will frequently be used. The vowels of the prefixes are often harmonized with the first vowel of the noun (e.g., thoboloko ‘tip of it’). A full noun phrase is used when a new Ground is introduced. In the case of answering a question about location, the Ground is normally expressed by a noun phrase, since it is new information. When talking about spatial relations concerning Grounds that are established in discourse, prefixes are preferred (e.g., within an elicitation task).

The possessive phrase with a relational noun can be followed directly by a directionality marker (e.g., horhorho boloko wâya ‘from the tip of the landform’). Alternatively, an optional configurational noun can be added (e.g., horhorho boloko diako wâya ‘from the top of the tip of the landform’). Some configurational nouns often co-occur with certain relational nouns, and the two can eventually become a lexicalized whole. The result is either a complex configurational noun, such as nakanroko ‘between’ (lit. ‘middle inside body’) or a complex relational noun such as rheroko ‘mouth’ (lit. ‘edge inside body’), both containing the configurational noun roko ‘inside body’. When the lexicalization process is complete, the first element of such possessive phrases can no longer be substituted with a personal prefix. This differentiates lexicalized phrases such as rheroko ‘mouth’ and nakanroko ‘between’ from phrases that are not lexicalized and can readily substitute
the possessor with a prefix (cf. horhorho boloko ‘tip of the landform’ and ihoboloko ‘tip of it’). In the following sections, the differential use of personal prefixes with possessive phrases serves as a measure of the lexicalization of landform expressions.

4.4.1.2 Configurational nouns

Configurational nouns are an optional, though frequent, element of the spatial expression—they encode the spatial relation that holds between the Figure and the Ground. A few examples of configurational nouns are given in Table 45 (see also section 3.6.4 for more examples).

<table>
<thead>
<tr>
<th>Form</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>diako</td>
<td>top; elevated part of an entity; secondary meaning ‘above’</td>
</tr>
<tr>
<td>khona</td>
<td>adhering; used when support is not by a horizontal surface; also ‘along’</td>
</tr>
<tr>
<td>rako</td>
<td>inside a liquid, typically water, but other liquids as well</td>
</tr>
<tr>
<td>ābo</td>
<td>under; used in the relative frame of reference (from onabo ‘ground’)</td>
</tr>
<tr>
<td>koloko</td>
<td>inside an unbounded container (e.g., rain, ash, fire), related to loko ‘inside’</td>
</tr>
<tr>
<td>bana</td>
<td>surface; usually a non-elevated surface</td>
</tr>
</tbody>
</table>

Configurational nouns (e.g., diako ‘top’) are inalienable nouns, and form a possessive phrase with the Ground-denoting expression, whether it is a single noun (e.g., horhorho diako ‘top of the landform’) or a possessive phrase with a relational noun (e.g., horhoroho shi diako ‘top of the head of the landform’). The possessor can be replaced with a personal prefix if it is known from the context (e.g., thudiako ‘top of it’). Configurational nouns can be divided into two groups: non-projective and projective (Herskovits 2009). Non-projective configurational nouns express notions of containment, contact, and proximity. Their semantics is predominantly spatial and they are sometimes glossed with English prepositions. The primary meaning of, for instance, ida loko with the configurational noun loko ‘inside’ is ‘the inside of a calabash’. A secondary reading ‘a calabash full of something’, as a mensural expression, is possible too. However, such non-spatial uses are rare, and are not salient to the speakers; hence the distribution of configurational nouns is largely limited to the spatial expression. Projective configurational nouns, on the other hand, are a small group of relational nouns that receive a spatial meaning when combined with the directionality marker –n encoding locations and goals (§ 4.4.1.3). Take as an example the noun shibo ‘face’. When combined with the directionality marker –n, shibon stands for ‘in front of’—a spatial region projected from the part, not a location on the part itself. Projective configurational nouns require the knowledge of how the spatial configuration is established—that is, whether a relative, intrinsic, or absolute frame of reference is used (Levinson 1996, 2003, Levinson and Wilkins 2006).
4.4.1.3 Directionality markers and the what/where distinction

Lokono has three primary directional distinctions—namely, location and goal, source, and via. I discuss here only the conflated location and goal directionality, which is central to the discussion of landforms that follows. There are two location and goal markers: the what-marker bithi and the where-marker –n. Both markers encode the location and goal directionality, disambiguated by the semantics of the verb. Motion verbs like òsun ‘go’ imply a goal reading; other verbs imply a location reading of the expression with the directionality markers. While the two directionality markers encode both locations and goals, they are sensitive to the semantics of the noun they are combined with (Rybka 2014b). The what-marker appears with person- and object-denoting nouns, as in (218), while the where-marker with place-denoting nouns, as in (219).

(218) Bòsa boyo bithi.
   b–o:sa  b–oyo  bitʃi
   2SG_A–go  2SG_A–mother  LOC.WHT
   ‘Go to your mother.’ (Cassipora, 2013, natural discourse)

(219) Bòsa kabuyan.
   b–o:sa  kabiyã–ŋ
   2SG_A–go  field–LOC.WHR
   ‘Go to the field.’ (Cassipora, 2013, natural discourse)

The person-denoting noun oyo ‘mother’ in (218) is followed by the what-marker bithi, while the place-denoting noun kabuya ‘field’ in (219) appears with the where-marker –n. The reverse combinations are ungrammatical. Notice that the where-marker is a suffix, diachronically related to the free dative marker mun, while the what-marker is a free form. Each of the markers has also an atelic variant formed by adding the suffix –ro, namely bithiro and –nro, implying that the spatial configuration has not been fully reached. When we look at the combinatorial possibilities of the Lokono lexical items with the telic and atelic location and goal markers, a cline from person- to place-denoting terms appears. This cline is represented in Figure 12, in which check marks show possible combinations with the directionality markers.
Starting from the top left corner of Figure 12, person- and object-denoting nouns are characterized by their combinatorial possibilities with the *what*-marker *bithi*. They constitute thus the *what*-noun class, though there are slight differences within it. Person-denoting nouns allow both the telic *what*-marker (e.g., *boyo bithi* ‘at/to your mother’) and the atelic *what*-marker (e.g., *boyo bithiro* ‘toward your mother’). Nouns denoting physical objects can combine with the atelic *what*-marker (e.g., *ada bithiro* ‘toward a tree’), but not with the telic *what*-marker. Other nouns are characterized by their combinatorial possibilities with the *where*-marker –*n*, and thus constitute the *where*-noun category. Within this category there is some variation too. Relational nouns, projective configurational nouns, and proper place names combine with the telic and atelic *where*-marker (e.g., *Kasuporhin* ‘at/to Cassipora’ and *Kasuporhinro* ‘toward Cassipora’). Non-projective configurational nouns take the *where*-marker, but can also drop it if used in the telic mode. In other words, they can be unmarked in the telic location and goal directionality (e.g., *tholoko* ‘at/to the inside of it’). In atelic mode the *where*-marker is always present (e.g., *tholokonro* ‘toward the inside of it’). Finally, zero marking appears always on demonstrative adverbs (e.g., the medial demonstrative adverb *yara* ‘there’), unless they are used in the atelic mode, in which case the *where*-marker is still present (e.g., *yaranro* ‘toward there’).

The cline in Figure 12 spans thus from person-denoting nouns, through object-denoting nouns, to nouns denoting places, and finally to terms that have a purely spatial function that can no longer be classified as nouns (i.e. demonstrative adverbs). Nevertheless, two classes of nouns can be distinguished on the basis of

<table>
<thead>
<tr>
<th></th>
<th>What-category</th>
<th>Where-category</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>person-denoting nouns</td>
<td>relational nouns, place names, projective configurational nouns, non-projective configurational n.</td>
</tr>
<tr>
<td><em>what</em>-marker telic</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><em>what</em>-marker atelic</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><em>where</em>-marker telic</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><em>where</em>-marker atelic</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>telic <em>where</em>-marker dropped</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
their directionality markers: *what*-nouns and *where*-nouns. The categories were labeled *what-* and *where-*noun, since the interrogative *hama* ‘what’ and *halo* ‘where’ also belong in the respective groupings. The distinction is also reflected in the anaphoric devices used to refer back to such nouns.

(220) Bôsa thibithi.

\[
\begin{align*}
\text{b–o:sa} & \quad \text{ţf–biţfī} \\
2\text{SG} & \quad 3\text{F} & \quad \text{LOC:WHT}
\end{align*}
\]

‘Go to her.’ (Cassipora, 2013, natural discourse)

(221) Bôsa yon.

\[
\begin{align*}
\text{b–o:sa} & \quad \text{yō–ŋ} \\
2\text{SG} & \quad \text{LOC:ANPH–LOC:WHR}
\end{align*}
\]

‘Go there (anaphoric).’ (Cassipora, 2013, natural discourse)

In (220), which is an equivalent of (218), the *what*-noun *boyo* ‘your mother’ is replaced by the 3rd person prefix attached to the *what*-marker. In (221), which is an equivalent of (219), the *where*-noun *kabuya* ‘field’ is substituted by a locative anaphoric adverb *yo*. Reverse combinations are ungrammatical.

Lokono has thus linguistic means to distinguish person- and object-denoting nouns from place-denoting nouns. This type of nominal classification manifests itself only in the spatial expression. In chapter 7 I show that switches between the two categories result in systematic changes reflecting the ontological features of the referents: *what*-marked nouns refer to more bounded entities and *where*-marked nouns refer to less bounded entities. The *what/where* distinction has therefore an ontological basis, and can also be observed in other languages; for a comparative study of the *what/where* dichotomy see chapter 8. As such, the distinction bears striking similarities to other types of nominal categorization (e.g., the mass/count distinction). It is against this dichotomy that we shall discuss landform expressions in order to see whether the language groups them with *what*-nouns or *where*-nouns.

### 4.5 Landform expressions

All Lokono landform expressions include the term *horhorho* ‘landform’.\(^{59}\) Diachronically, *horhorho* is a reduplicated form. Bennett (1989), who does not distinguish between the liquid phonemes written here as *<r>* (a tap/trill) and *<rh>* (a retroflexed apical flap), lists the non-reduplicated *oró* ‘sediment, grounds, deposit’ for the Guyanese dialect of Lokono. However, whether with or without the initial /h/, the non-reduplicated *horho* is no longer recognized as a meaningful unit by the

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\(^{59}\) Convex landforms that are not the result of the general forces of nature but have an external cause can also be referred to with the inalienable noun *horhoma*, derived from the non-reduplicated root *horho*. A culturally specific but typical referent of *horhoma* is a heap of earth around a cassava plant, pushed up by the tubers growing under the ground, the presence of which indicates that the tubers are already large enough to be harvested.
Surinamese Lokono. Synchronically, horhorho is thus a simplex unanalyzable form in the Surinamese dialect.

The noun horhorho ‘landform’ can be used to refer to land features regardless of the level of granularity. Hence we can use horhorho to talk about the ground below one’s feet, a particular area, a country, and the world as a whole. In other words horhorho is insensitive to scale. Moreover, horhorho is unspecified for shape; it can refer to convex, horizontal, or concave landforms. It can also refer to plots of land. These can belong to people, which can be expressed linguistically through possessive phrases. When possessed, horhorho has an irregular form horhorha.

The noun horhorho can also be relativized to indicate particular types of landforms (e.g., wayalho horhorho ‘clayey landform’ with the noun waya ‘clay’ combined with a relativizer). However, horhorho cannot be used as a mass noun ‘soil’, as in ‘I bought some soil for my flowers’, which suggests that it is a set noun. This is evidenced by its compatibility with numerals, as in (222)—a stative clause, in which the noun phrase bian horhorho functions as the preposed subject of the stative predicate formed by a demonstrative adverb. The example is a description of a WITT stimulus, showing two hills.

(222) Bian horhorho yâka.
   bian  horhorho  ya:–ka
   two  landform  LOC.DEM.PRF–PFV
   ‘There are two landforms here.’ (Cassipora, 2012, WITT)

In (222), horhorho combines directly with a numeral and is unmarked for number, which classifies it as a set noun. This example was used to describe a drawing showing two convex landforms (i.e. hills), but such combinations with numerals are also common when talking about plots of land. Syntactically, horhorho behaves like a typical set noun. It can function as the core argument of the verb, as in (223).

(223) Dôthika satho horhorho.
   dô–otjika  sa–t’o  hororho
   1SGA–find  good–SBJ.REL:F–landform
   ‘I found a good landform (good land).’ (Cassipora, 2009, natural discourse)

In (223), horhorho is relativized by a stative verb combined with a relativizer, and functions as the object of the active verb ôthikhin ‘find’. It can also function as the Ground-denoting noun in a spatial expression, as illustrated in example (224), which is a description of the WITT stimulus as well, showing a hill with two trees on top of it.

(224) Danda orhorhonro, bian ada dashibonka.
   dâ–anda  ororô–n–ro  bian  ada  da–fibô–n–ka
   1SGA–arrive landform–LOC.WHR–ATL  two  tree  1SGA–face–LOC.WHR–PFV
   ‘I came toward a landform, two trees were in front of me.’ (Cassipora, 2012, WITT)
In (224), *horhorho* is part of a spatial expression with the atelic *where*-marker. The expression functions as an adverb encoding the goal of motion expressed by the verb *andun* ‘arrive’. The noun *horhorho* refers in this example to a convex landform again.

The question arises what are the combinatorial possibilities of *horhorho* within the spatial expression vis-à-vis the *what*- and *where*-markers. In what follows I examine how the noun behaves with respect to the distinction. I show that it is intermediate between object- and place-denoting nouns, though it is closer to the latter. First, *horhorho* combines with the atelic *where*-marker, as we saw in example (224) above. It can as readily combine with the telic variant. Interestingly, no land relief information is assumed in the expression *horhorhon* and *horhorhonro*, as there is no element specifying the shape of the referent of *horhorho*. Convex, concave, and horizontal landforms can be referred to with *horhorho*, and only the context disambiguates them, as shown in (225), which describes the scene presented in Figure 13 below.

(225) *Dirhibiswa orhorhonro, thudoko loko abaro bokotada de.*

\begin{align*}
\text{d–iṣibiswa} & \quad \text{oqo–n–ro} \\
1\text{SG} & \quad \text{roll.REFL. landform–LOC.WHR–ATL} \\
\text{ṭi–doko} & \quad \text{loko aba–ro} \quad \text{bokota=da=de} \\
3\text{F} & \quad \text{lap inside one–f hold=DIRCT=1SGB} \\
\text{I rolled toward a landform, at the inside of its lap, one (tree) stopped me.} \\
\text{(Cassipora, 2012, WITT)}
\end{align*}

In (225), there are two spatial expressions functioning as adjuncts. First, we have the ambiguous *horhorhonro* ‘toward a landform’, which in example (222) referred to a convex feature. Second, however, we have the expression *thudoko loko* ‘at the inside of the lap of it’, with the configurational noun *loko* ‘inside’ zero-marked for telic directionality. The noun *doko* ‘lap’ refers to a concavity, and hence disambiguates the sentence, implying that in this case the referent is a concave landform. Examples such as (222) and (225) speak volumes for the fact that *horhorho* itself is unspecified for shape.
The examples shown until now demonstrate that horhorho combines with the where-marker, and is thus grouped with other where-nouns. However, horhorho can also combine with the atelic variant of the what-marker bithiro, as in (226).

\[\text{Dadukha aba waboroko horhorho bithiro.}\]
\[\text{da–dik’}a \ aba \ waboroko \ hoporo \ bitʃi–ro\]
\[1SG–see \ INDF \ road \ landform \ LOC.WHT–ATL\]
\[’I see a road toward a landform (as an object).’ (Cassipora, 2012, MPM)\]

In (226) the what-marker implies the reading of horhorho as an object rather than a place. The consultants gave only two contexts, in which this phrase is felicitous, namely when talking about a landform in the distance or as a point on a map. This corroborates the idea that the what-marker is associated with more bounded entities, discussed in chapter 7. The phrase horhorho bithiro can be used to talk about motion toward a convex or a horizontal landform, but not toward a concave landform, probably because negative spaces are harder to think of as objects. However, the telic equivalent *horhorho biti is unacceptable, as is the case with all object-denoting nouns (i.e. only person-referring nouns combine with the telic biti).

The contrast between the two examples with the what- and where-markers is also visible in the anaphoric devices used to refer to the Ground in such clauses. Examples (227) and (228) are paraphrases of (225) and (226), respectively.
(227) Dirhibiswa yonro.
\[ \text{d–r} \text{ibiswa y} \text{o}–\text{n–ro} \]
\[ 1\text{SG}–\text{roll}.\text{REFL. LOC.\text{ANPH.}–\text{LOC.}\text{WHR.–ATL} \]
‘I rolled myself toward there (anaphoric).’ (Cassipora, 2009, LEV)

(228) Dadukha aba waboroko thibithiro.
\[ \text{da–d} \text{i} \text{k} \text{h} \text{a} \text{aba} \text{waboroko tʃi–bi} \text{ʃi–ro} \]
\[ 1\text{SG}–\text{see} \text{INDF road 3}\text{F}–\text{LOC.WHT–ATL} \]
‘I see a road toward it.’ (Cassipora, 2012, MPM)

In the case of horhorho bithiro ‘toward a landform (as an object)’, horhorho can be substituted by personal prefixes but not by the locative anaphoric adverb yo. And vice versa, horhorho in horhorhonro ‘toward a landform (as a place)’ can only be substituted by the locative anaphoric adverb yo.

Summing up, the noun horhorho is insensitive to scale and shows features of both place-denoting nouns (where-marker) and object-denoting nouns (atelic what-marker). However, the where-marking is clearly the more natural choice, while the what-marking is restricted to specific contexts. The difference in use appears to depend on perceptual boundedness in keeping with the findings described in Rybka (2014b), discussed in chapter 7. The phrase horhorho bithiro can be used when talking about landforms in the distance or on a map—features that are visually more bounded. The expressions horhorhonro and horhorho bithiro can therefore be read as ‘toward an unbounded landform’ and ‘toward a bounded landform’, respectively. Summarizing, horhorho is intermediate between object- and place-denoting nouns, though it is closer to the latter.

4.5.1 Complex landform expressions

Having analyzed the grammatical features of the landform term horhorho, let us move to the complex expressions that include it. Horhorho can be combined with relational and configurational nouns into possessive phrases. The majority of these expressions are not lexicalized.\(^{60}\) Semantically, the possessed elements specify spatial features of horhorho by naming parts or configurations thereof. Every landform is therefore an instantiation of horhorho; this includes convex, concave, and horizontal landforms. Since many of these forms appear mostly, and sometimes exclusively, in spatial expression, and since we want to know which location and goal directionality marker combines with them, in Table 46 the directionality markers are given too.\(^{61}\) The symbol \(\emptyset\) in Table 46 means that the directionality

\(^{60}\) The only exception is the lexicalized expression thushirima ‘headland’, in which the 3rd person prefix can no longer be substituted for horhorho. Its lexicalization is probably due to its link with the hydrological domain, which is of much more importance to subsistence strategies, and which shows a higher degree of lexicalization than landform terms.

\(^{61}\) In Table 46, I omitted the relational phrase horhorho debo ‘waist of landform’, which appeared only once in the data. Baarle et al. (1989) list horhorho debo as ‘valley’, but my consultants disagreed. Baarle et al. (1989) and Bennett (1989) mention also horhorho abo.
marking can be dropped. The asterisk marks two relational nouns of verbal origin that were used only by one speaker. Additionally, relational nouns are given with the configurational nouns they usually combine with. The brackets indicate the configurational nouns that are not obligatory with the relational term in question (the combination doko loko ‘inside of the lap’ may be lexicalized). The Figure 1 in the online Appendix III shows the focal denotation of some of the terms given in Table 46, based on the Landform Coloring Task.

### Table 46. Landform Terms with Relational and Configurational Nouns.

<table>
<thead>
<tr>
<th>Ground</th>
<th>Relational noun</th>
<th>Configurational noun</th>
<th>Location/ goal marker</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>horhorho</td>
<td>bana ‘surface’</td>
<td>–n/∅</td>
<td>landform’s surface</td>
<td></td>
</tr>
<tr>
<td>horhorho</td>
<td>diako ‘top’</td>
<td>–n/∅</td>
<td>landform’s top</td>
<td></td>
</tr>
<tr>
<td>horhorho</td>
<td>khona ‘adhering’</td>
<td>∅</td>
<td>landform’s slope</td>
<td></td>
</tr>
<tr>
<td>horhorho</td>
<td>kosa ‘near’</td>
<td>–n/∅</td>
<td>landform’s vicinity</td>
<td></td>
</tr>
<tr>
<td>horhorho</td>
<td>kohorako ‘among’</td>
<td>–n/∅</td>
<td>landform’s inside</td>
<td></td>
</tr>
<tr>
<td>horhorho</td>
<td>nakanroko ‘between’</td>
<td>–n/∅</td>
<td>landform’s middle</td>
<td></td>
</tr>
<tr>
<td>horhorho</td>
<td>âbo ‘under’</td>
<td>–n</td>
<td>below landform</td>
<td></td>
</tr>
<tr>
<td>horhorho</td>
<td>yabo ‘behind’</td>
<td>–n</td>
<td>behind landform</td>
<td></td>
</tr>
<tr>
<td>horhorho</td>
<td>shibo ‘in front’</td>
<td>–n</td>
<td>in front of landform</td>
<td></td>
</tr>
<tr>
<td>horhorho</td>
<td>duna ‘beside’</td>
<td>–n</td>
<td>beside landform</td>
<td></td>
</tr>
<tr>
<td>horhorho</td>
<td>tola ‘depth’*</td>
<td>(khona) ‘adhering’</td>
<td>–n (–w/∅)</td>
<td>landform’s depth</td>
</tr>
<tr>
<td>horhorho</td>
<td>lama ‘slope’*</td>
<td>(khona) ‘adhering’</td>
<td>–n (–w/∅)</td>
<td>landform’s slope</td>
</tr>
<tr>
<td>horhorho</td>
<td>boloko ‘top’</td>
<td>(loko ‘inside’)</td>
<td>–n (–w/∅)</td>
<td>landform’s summit</td>
</tr>
<tr>
<td>horhorho</td>
<td>shi ‘head’</td>
<td>(diako ‘top’)</td>
<td>–n (–w/∅)</td>
<td>landform’s top</td>
</tr>
<tr>
<td>horhorho</td>
<td>anak ‘middle’</td>
<td>(loko ‘inside’)</td>
<td>–n (–w/∅)</td>
<td>landform’s middle</td>
</tr>
<tr>
<td>horhorho</td>
<td>toro ‘heel’</td>
<td>(roko ‘in.body’)</td>
<td>–n (–w/∅)</td>
<td>landform’s heel</td>
</tr>
<tr>
<td>horhorho</td>
<td>rhebo ‘edge’</td>
<td>(khona ‘adhering’)</td>
<td>–n (–w/∅)</td>
<td>landform’s edge</td>
</tr>
<tr>
<td>horhorho</td>
<td>olabwa ‘side’</td>
<td>(khona ‘adhering’)</td>
<td>–n (–w/∅)</td>
<td>landform’s othr. side</td>
</tr>
<tr>
<td>horhorho</td>
<td>doko ‘lap’</td>
<td>loko ‘inside’</td>
<td>–n (–w/∅)</td>
<td>landform’s lap</td>
</tr>
</tbody>
</table>

With respect to the what/where distinction, the attested phrases horhorho headed by relational and configurational nouns behave like any other relational and configurational expressions. Relational nouns and projective configurational nouns (e.g., âbo ‘below’, yabo ‘behind’, shibo ‘in front’ duna ‘beside’) take the where-marking. Non-projective configurational nouns take the where-marking, but can also stand unmarked. This groups the complex landform expressions with other where-nouns—that is, nouns denoting places. Below, the relational and configurational landform expressions are discussed in detail (§§ 4.5.1.1 and 4.5.1.2, respectively). Following this discussion comes the analysis of a more idiosyncratic verbal strategy used to coin landform terms (§ 4.5.1.3).

‘mountain’, equally unacceptable to my consultants. Goeje (1928) gives also horhorho arima khona ‘along the shore’, where khona is a configurational noun meaning ‘adhering’ and arima is possibly derived from ari ‘tooth’.
4.5.1.1 Landform terms with relational nouns

Relational nouns specify a part of horhorho and form a possessive phrase with it. The phrases are not lexicalized since the possessor can be replaced with a personal prefix, as in (229), describing a hill with a solitary tree on top of it.

(229) Abaro khan ada, tā thobolokon kiba.
   aba-ro=k\textsuperscript{3}\textsubscript{aŋ} ada ta: \textsuperscript{3}t\textsubscript{o}–bolok\textsuperscript{3}\textsubscript{ŋ} kiba
   one–F=DIM tree far \textsuperscript{3}F\textsubscript{A}–tip–LOC.WHR too
   ‘One little tree, far on the tip of (a landform) too’ (Cassipora, 2012, WITT)

In (229) the 3\textsuperscript{rd} person prefix substitutes for horhorho, which is known from the context in the director matcher task revolving around horhorho. The expression thoboloko ‘tip of it’ indicates the very top of the landform (Figure 1 in the online Appendix III). The expression can be directly combined with the directional marker—the where-marker is used, whether telic or atelic. The speakers deemed the use of the what-marker ungrammatical.

Example (225) given here again as (230) contains, apart from the ambiguous spatial expression horhorhonro discussed above, also the relational noun dok\textsuperscript{o} ‘lap’.

The example shows that relational phrases, instead of combining with a directional marker, can also form a possessive phrase with a configurational noun specifying the spatial relation.

(230) Dirhibiswa orhorhonro, thudoko loko abaro bokotada de.
   d–iq\textsubscript{i}biswa oq\textsubscript{or}–n–ro
   1SG\textsubscript{A}–roll.REFL landform–LOC.WHR–ATL
   \textsuperscript{3}t\textsubscript{i}–doko loko aba–ro bokota=da=de
   3\textsubscript{F\textsubscript{A}}–lap inside one–F hold=DIRECT=1SG\textsubscript{B}
   ‘I rolled toward a landform, at the inside of its lap, one (tree) stopped me.’
   (Cassipora, 2012, WITT)

In (230) horhorho is combined with the atelic location and goal where-marker lending the general reading ‘toward a landform (as a place)’. The same geographic feature is also referred to by the 3\textsuperscript{rd} person prefix on the relational noun dok\textsuperscript{o} ‘lap’. The meaning of dok\textsuperscript{o} requires the Ground’s main axis to be bent at an angle, but not necessarily in the vertical dimension. When combined with horhorho, dok\textsuperscript{o} indicates a bend in the landform, a foothill, or a valley (Figure 1 in the online Appendix III). The noun dok\textsuperscript{o} combines with the configurational noun loko ‘inside’, possibly forming a lexicalized whole (i.e. dok\textsuperscript{o} loko ‘inside of the lap’). The whole expression with horhorho is, however, not lexicalized since the possessor can still be replaced by the 3\textsuperscript{rd} person prefix (e.g., tholoko ‘inside of it’). With respect to the what/where distinction, the expression (ending in a non-projective configurational noun loko ‘inside’) takes the where-marker, but can optionally drop it as in (230).

Combinations of a relational noun and a configurational noun can become lexicalized, as is the case with the already discussed nakanroko ‘between’—a combination of the relational noun nakan ‘middle’ and the configurational noun
roko ‘inside body’ (and possibly also with doko loko above). An example of a landform expression containing it is given below. Example (231) was used as part of the description of the stimulus in Figure 13 above.

(231) [...] aba kiba orhorho nakanrokhodi.
    aba kiba ọrọọ nakanroko–d’i
    one too landform between–VIA
‘[...] one more, through the middle of a landform.’ (Cassipora, 2012, WITT)

In (231), which is a juxtaposition of the Figure and a spatial expression, the via directionality marker is used, causing the aspiration of the final /k/ of nakanroko ‘between’. The phrase orhorho nakanroko refers to what in English would be a valley. Importantly, due to the transnumeral nature of horhorho, horhorho nakanroko can refer both to the ‘middle’ of a single horhorho (vertical or horizontal) as well as the ‘middle’, or center, between two instances of horhorho (Figure 1 in the online Appendix III). In the case of horhorho nakanroko we can no longer substitute the relational phrases horhorho nakan ‘middle of a landform’ with a 3rd person prefix, since nakanroko is a fixed lexicalized configurational noun. However, this only tells us something about the history of the configurational noun nakanroko. The landform expression remains a non-lexicalized phrase with a configurational noun, since horhorho can be replaced by a personal prefix (e.g., thunakanroko ‘between them/in the middle of it’).

Two relational nouns were used less frequently with reference to landforms, namely shibo ‘face’ and duna ‘arm’. Though rare, they demonstrate an important feature of relational nouns—the fact that some of them can function as projective configurational nouns. The phrase horhorho shibo, for example, translates as ‘landform’s front’, a relational phrase, exemplified in (232).

(232) Budukha to horhorho, firoka thushibo.
    bi–dik’a to ọrọọ firo–ka t’i–jibo
    2SGA–see DEM:F landform big–PFV 3FA–face
‘Look at the landform, its front is big.’ (Cassipora, 2012, MPM)

In (232), the 3rd person prefix cross-references the noun horhorho. The expression thushibo refers a part of the landform (i.e. its frontal slope), and functions as the subject of the stative verb firon ‘big’. When used projectively, the noun shibo does not refer to a part but to a search zone projected from the part (i.e. ‘in front’). This meaning appears when shibo is followed by the where-marker, or when it is used in an empty verb construction with a posture adverb encoding a reciprocal spatial relation, as in (233).

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62 Though scarce in my data, the combination horhorho shibo was apparently important enough to be noted in the Lokono-German dictionary, cf. hurrurússibu ‘the front side of the mountain, the surface of the mountain’ (Schumann and Schumann 1882a).
The reciprocal spatial construction consists of a spatial adverb derived with the adverbializer –ko from the noun shibo ‘face’ prefixed with the attributive prefix ka–. The English equivalent would be ‘in front of one another’ (notice that the final vowel of the configurational noun becomes an /â/ due to the presence of the adverbializer). The drawing that this sentence describes shows two elevations with their slopes facing each other. Each of them is conceived of as both the Figure and Ground—one landform is in front of the other. The Figure is not located on the part of the Ground but in an area projected from this part. Analogically, the term dunan ‘beside’ (from duna ‘arm’) projects a search zone at the side of the Ground. Expressions horhorho shibon and horhorho dunan are not lexicalized (i.e. horhorho can be substituted by the 3rd person prefix), and of course require the where-marker.

Summing up, the combination of horhorho with relational nouns results in the specification of a particular part of the landform. None of the relational terms found in these expressions is exclusive to the landscape domain; they appear readily with small-scale object-denoting nouns as well. However, the combinations of horhorho with relational nouns have only been attested referring to landscape entities, which may be a gap in the data. The attested relational phrases are not lexicalized—the possessor can be replaced with a personal prefix. Syntactically, relational nouns function independently of the spatial expression, as the arguments of the verb (e.g., (232)). When part of a spatial expression they combine with the where-marker, and are thus grouped with where-nouns denoting places.

4.5.1.2 Landform terms with configurational nouns

When the need to be more specific about the spatial properties of horhorho appears, it is possible to expand the spatial expression by adding a configurational noun. Configurational nouns can form a possessive phrase with a relational phrase containing horhorho as in example (230) above, or with the landform term horhorho itself as in (234) below, which comes from an instructional narrative about making a dugout canoe.

(234) Horhorho bananda no, wathikada no.

hoɽoro bana–n=da=no wa–tʃika=da=no
landform surface=NMLZ=DIRCT=3Fg 1PLs–dig=DIRCT=3Fg
‘When (a tree) is on the surface of a landform, we hollow it out.’ (Apoera, 2009, narrative)
non-projective configurational noun, can stand unmarked in the telic location and
goal directionality. The where-marker is obligatory in the atelic mode, which groups
this expression with other where-nouns. The configurational noun bana ‘surface’
has the meaning of a two-dimensional planar area, especially one that is not raised,
relative to the speaker. In the Landform Coloring Task, the speakers represented it
as a horizontal line below the contour of the landform (Figure 1 in the online
Appendix III). The phrase horhorho bana refers to any flat, not raised, part of the
landform. The same expression can be used to talk about the ground below one’s
feet, as in (234), as well as large-scale horizontal landforms—that is, plains,
plateaus, and geographic areas (e.g., a country). The expression horhorho bana is
used often for cleared areas such as the village fora (Figure 14). In the case of flats
covered with vegetation, speakers would refer to the vegetation type rather than
simply calling the area horhorho bana.

The configurational noun diako ‘top’, in turn, gives a convex reading. The noun
diako describes configurations in which the Figure is on top of a three-dimensional
Ground; hence the compositional reading of horhorho diako as a convex landform.

(235) Thurhibiswa to orhorho diakon
  ti-iṭbiswa to otoro d’akō–ŋ
  3Fa–roll REFL DEM.F landform top–LOC.WHR
  ‘(A ball) rolled to the top of the landform.’ (St. Rose de Lima, 2011, LEV)

The verb ribisonon ‘roll oneself’, having no inherent directionality (cf. (225)),
where the same verb appears), does not contribute to the spatial meaning.
Interestingly, (235) is an example from the Event Triads stimuli that depicts small-
scale objects. The same expression was also used to talk about large-scale convex
landforms, and even islands.\textsuperscript{63} This shows that \textit{horhorho diako}, just like \textit{horhorho bana}, and in fact other configurational phrases with \textit{horhorho}, is insensitive to scale. It needs to be mentioned that in practice \textit{horhorho diako} is often exchangeable with \textit{horhorho bana}, the logic behind it being that the surface of a landform is often its top.

Another example of a configurational expression comes from the descriptions of drawings of a hill with a tree on its slope, given in Figure 15.

\begin{center}
\begin{tabular}{l}
(236) \textit{torabo orhorho khonanro, anaku loko}.

to–ra–bo \hori o\hori o\hori k\hori n\hori a\hori–n–ro \hori a–naki \hori loko
\end{tabular}
\end{center}

\begin{center}
DEM–MED–CNTR landform adhering–LOC.WHR–ATL EXPL–middle inside
\end{center}

‘[...] toward the non-horizontal part of that other landform, in the middle.’

(Cassipora, 2012, WITT)

Example (236) is not a complete clause but a list of two spatial expressions, of which only the first one \textit{orhorho khonanro} with the configurational noun \textit{khona} interests us here. The noun \textit{khona} is a special configurational noun in that it always drops the where-marker in the telic directionality, as the combination \textit{khonan} is lexicalized and means ‘about, concerning’. However, the where-marker is present in the atelic mode, grouping this expression with other where-nouns.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure15.png}
\caption{Stimuli that elicited \textit{horhorho khona} ‘adhering to landform’}
\end{figure}

The configurational noun \textit{khona} expresses the idea of contact that obliterates horizontal support and foregrounds the idea of the adhesion of the Figure to the

\textsuperscript{63} Bennett (1989) and Goeje (1928) list \textit{kairi} as ‘island’ or, as a place name ‘the island of Trinidad’. The speakers of Cassipora were only vaguely familiar with the term and if at all, used it with the meaning ‘round formation’, ‘a clump of bush in the savannah’ or ‘a clearing in the forest’. As a landscape term, \textit{kairi} refers therefore to place defined as an absence in either the of the two main landscape features \textit{konoko} ‘forest’ (i.e. clearing) or \textit{karhow} ‘savanna’ (i.e. clump of bush).
Ground (by sticking, hanging, leaning, clinging, wrapping etc.). This inherent lack of horizontal support in *khona* gives the reading of a structure with a slope. If *horhorho khona* were used as a description of a horizontal scene, it would only be felicitous if the Figure were glued or otherwise attached to the surface of the landform, thus where it is not the Ground itself that provides support for the Figure. However, in the Landform Coloring Task, most speakers colored the whole outline of the landform when asked to mark *horhorho khona*, possibly due to the fact that its scope depends as much on the Ground as on the Figure, and the Figure was not specified.

Example (237), describing a scene where a creek passes through a valley, illustrated in Figure 13 above, demonstrates the use of two other configurational nouns, and the use of personal prefixes with configurational nouns.

(237) *To onikhan thokosa, thokoborokhodire ma balin.*

\begin{tabular}{llllllll}
\text{to } & \text{ seksi}^{\text{a}} & \text{tho–kosa} & \text{tho–koboroko} & \text{di–re} & \text{ma} & \text{balin} \\
\text{DEM:} & \text{rain} & \text{near} & \text{among} & \text{REST} & \text{NMLZ} & \text{near} \\
\end{tabular}

‘It, the creek, is right through (the landforms), passing, near them.’

(Cassipora, 2012, WITT)

The first configurational noun *kosa* ‘near’ appears unmarked for directionality. The second, *koboroko* is combined with the via directionality marker –*di* that causes the aspiration of the /k/ in the configurational noun *koboroko*. The restrictive marker –*re* that follows necessitates a special syntactic structure with the empty verb *o/a* and the expletive prefix cross-referring to the Figure-denoting noun (*onikhan* ‘creek’). The noun *koboroko* expresses a type of containment. It is used when a multipartite Ground (e.g., human body) contains the Figure or when many exemplars of the same Ground (e.g., many people) surround the Figure. The configurational noun *koboroko* could therefore be translated as ‘inside its many parts’ or as ‘among many of them’, which goes hand in hand with the transnumeral nature of *horhorho*. As explained in section above in possessive phrases the possessor can be expressed with a prefix. Landform expressions with configurational nouns are no exception: *horhorho* can be substituted with the 3rd person feminine prefix when it is clear that the utterance is about *horhorho* (e.g., *thokosa* and *thokoboroko* in (237)). This applies to all attested configurational landform expressions.

Summing up, it should be stressed that all configurational nouns that appear with *horhorho* appear with object-denoting nouns (i.e. they are not specific to the landscape domain). The attested landform terms are not lexicalized. Semantically, these expressions do not name a landform *per se*, but rather a configuration of *horhorho* ‘landform’. Syntactically, most of them cannot be used as the arguments of the verb, and are thus limited to the spatial expression. The configurational landform terms combine with the *where*-marker, or stand unmarked in the location and goal directionality. They are thus grouped with *where*-nouns.
4.5.1.3  Landform terms with verbal forms

The relational and configurational expressions described in section 4.5.1.1 and 4.5.1.2 prevail in the data and are used by all speakers. The constructions described below are more idiosyncratic, but rely on the same idea—horhorho is a general landform that can be further specified. As opposed to the dominant strategies, however, the expressions discussed here use verbal instead of nominal forms.

In (238) an example of a landform expression containing an event nominalization, the structure of which was discussed in section 4.4, is given. Semantically, the landscape term horhorho in phrases with event nominalizations is a participant in the event lexicalized in the root. In (238), horhorho functions as the performer of the activity mudun ‘ascending’.

(238)  

ororo  miiŋ-ŋ d'akoa–ka to oraro
landform  ascend–NMLZ  above–PFV  DEM:F  cloud

‘The cloud is above the ascending of a landform.’ (St. Rose de Lima, 2011, BOWPED)

In (238) horhorho mudun ‘ascending of a landform’ is part of a spatial expression, followed by the perfective marker, forming a stand-alone spatial clause. Notice that in (238) diako has a secondary meaning ‘above’ (not ‘top’), and does not contribute to the convex landform reading. The place taken by the event nominalization in the spatial expression suggests it could be analyzed also as a relational term. It forms a possessive phrase with the Ground-denoting noun (horhorho mudun), which in turn functions as the possessor in a possessive phrase with a configurational noun (horhorho mudun diako).

By analogy, one can use the antonym of mudun ‘ascending’, namely thokodan ‘descending’ to talk about a convex landform (horhorho thokodan ‘descending of a landform’), as in (239), showing a tree on the bottom of a slope.

(239)  

Tho thoko dinamako ma kiba.
3 F  o–t'okoda–ŋ–ŋ  d'ina–ko  m–a  kiba

‘In the descending of (the landform), one (tree) is standing too.’ (Cassipora, 2012, WITT)

In (239) the event nominalization is prefixed with the 3rd person prefix referring to the landform and suffixed with the where-marker. The two affixes show that this type of landform expressions is not lexicalized, and is grouped with the where-nouns. Interestingly, horhorho mudun and horhorho thokodan, though based on antonymic verbs, have the same referent, namely the slopes, but viewed from

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64 This type of nominalization can appear also in dependent clauses. Therefore, horhorho mudun could be a complement of, for instance, the verb dakhun ‘see’ describing the fact of seeing a convex landform or the act of seeing a landform literally rise.
different perspectives (Figure 1 in the online Appendix III). If one moves up a slope it is called *horhorho mudun*, but if one moves down the same slope it is called *horhorho thokodan*.

When stative verbs are used, *horhorho* functions as the subject of the clause. In such expressions, *horhorho* does not participate in the activity but in the state lexicalized in the verbal root.

(240) *Tora horhorho ayomunka ken ada thâbonka.*

This landform is high and there is a tree below it. (Cassipora, 2012, WITT)

In (240) *horhorho* functions as the subject of the stative predicate *ayomun* ‘high’. Historically, the verb *ayomun* is a directional phrase containing *mun*, the non-reduced form of the *where*-marker, which links this expression to the spatial expressions discussed in previous sections. The second part of (240) is a stand-alone spatial clause with the configurational noun *âbo* ‘below’ and a personal prefix referring to the landform.

Alternatively, stative verbs can be combined with a relativizer and used as modifiers of the landform term. We have already seen an example of that in (223), where the stative verb *san* ‘good’ was combined with a relativizer. In (241) we see an example of a stative verb *ayomun* ‘high’ that encodes a spatial property.

(241) *Abaro kho ayomuntho horhorho yâka.*

‘There are many high landforms here (lit. there is not one).’ (Pet 1987:298)

The stative verb *ayomun* ‘high’, combined with a relativizer, modifies the landform term *horhorho*, which functions as the subject of the stative predicate with the proximal demonstrative adverb *yâ*. The verb indicates that the landform is high. In other words, it conveys the meaning of a convex landform.

Summing up, whether convex or concave, landforms are again expressed as manifestations of *horhorho*, but this time as events (activities or states). Formally, the general landscape term *horhorho* can be combined with nominalized verbs and verbs combined with a relativizer, or function as the subject of the stative verb *ayomun* ‘high’. Apart from containing verbal rather than nominal roots, these expressions differ little from those described in previous sections—they are based on the same landscape term *horhorho* and are not lexicalized. Syntactically, however, they have the advantage of allowing the landform expression to appear as the subject or object of the verb, a feature that the configurational forms lack. Although event nominalizations were attested with the *where*-marker, the scarcity of examples prevents us from drawing definite conclusions about the behavior of the verbal forms with respect to the what/where distinction.
4.6 Conclusions

The expression of landforms in Lokono relies heavily on the single set noun *horhorho* ‘landform’. It can be used on its own or in combination with relational and configurational nouns that specify a part or a configuration thereof. The landform domain is therefore based on partonymic and spatial relations. Occasionally, verbal forms such as event nominalizations, relative clauses, or stative verbs are used with *horhorho* as well. All the attested expressions are not lexicalized.

Both landforms and entities at a surveyable scale can be referred to with the simplex term *horhorho*, and the phrases with configurational nouns. The use of relational nouns with *horhorho* seems restricted to large-scale entities, but this might be a data gap that has to be investigated further. The expressions based on verb forms are too rare (in the context of my data) to draw any definite conclusions, but both large and small scale referents have been attested. Lack of scale-sensitivity with respect to landforms has been reported for other languages, for example, Yélî Dnye, an isolate language of Rossel Island, in which the term *mbu* can refer to a heap of sand or a mountain (Levinson 2008:261). The Lokono case is, however, different as scale insensitivity of *horhorho* and the configurational expressions extends to all landforms, not only to convex structures. This is particularly interesting in the light of the claims made by geographers, suggesting that scale is an essential factor setting geographic entities aside from other types of entities (Granö 1997). Most Lokono landform terms collapse the scale distinction.

Although evidence is inconclusive, according to some speakers, the expressions describing landforms are sensitive to the type of material they are made of. A few speakers insisted that landforms clearly made of stone should be referred to with expressions analogical to those described here containing the set noun *shiba* ‘stone’ instead of *horhorho*. The abstract line drawings, however, elicited only expressions with *horhorho*, although in principle the material was unknown. I also do not have any natural discourse data where *shiba* appears in landform terms. In the case of the color photographs, the speakers sometimes did pay attention to the material—they described certain landforms as a form of *horhorho* and commented, using simulative and comparative markers, that it looked like *shiba*. If material-sensitive at all, the *horhorho* expressions are clearly the default.

With respect to the what/where distinction, the simplex term *horhorho* escapes the classification we have established. It can be combined both with the what-marker typical of object-denoting nouns and the where-marker typical of place-denoting nouns. It forms a category of its own, and the choice of the marker depends on how perceptually bounded the referent is. The complex expressions with relational and configurational nouns are clearly grouped with *where*-nouns. The more idiosyncratic verbal constructions have been attested with the where-marker too. In Lokono, where a grammatical distinction exists between person- and object-denoting nouns, on the one hand, and place-denoting nouns, on the other, landforms are clearly grouped with the place-denoting nouns. It appears that in languages where the what/where distinction is grammaticalized, landform terms tend to pattern with place-denoting nouns (Cablitz 2008; Huber 2014). As predicated by semantic theory à la Lyons (1977), Lokono landform terms are therefore intermediate
between first-order nouns (such as *ada* ‘tree’) and place-denoting terms (such as *Kasuporhi* ‘Cassipora’).

In this chapter I looked at linguistic encoding of the landform domain in Lokono. I started from the claim that folk ontologies do not represent phenomena as fields (Smith and Mark 2003:416). In other words, humans do not represent landforms as a spatial distribution of attributes, but rather as objects identified in space. The linguistic evidence gathered in previous sections shows that this assumption is problematic. If Lokono landform terms encoded objects, then these objects would be at best a type of an intermediate object. More accurately, the complex landform terms are expressed as parts of and place on the single landform *horhorho*. This contrasts with, for example, English landform expressions, which are linguistically unrelated. The Lokono linguistic encoding of landforms can therefore be better represented as a field-based conceptualization, where each point in the space defined as *horhorho* can be given a nominal value from the set of relational and configurational nouns given in Table 46 above. To represent the Lokono landforms in an object-based model means neglecting the fact that each and every Lokono landform expression is in a paradigmatic relationship to each and every other landform expression. In other words, every landform is linguistically expressed as a nominal value of *horhorho*.

Though field-based models of landforms are widespread in geography, the representation of landforms as a function of *horhorho* with nominal values is a new challenge for geographic modeling, due to the semantic content of relational and configurational nouns. To give a few examples, *bana* ‘surface’ refers to large flats that are not elevated. However, as we move through landscape, what was the top of a hill to be climbed (*horhorho diako*) becomes a non-elevated flat (*horhorho bana*) once we are on top. The referent of *horhorho bana* and *horhorho diako* will therefore shift together with the perspective. Analogically, *horhorho mudun* and *horhorho thokodan* refer to the same geographic feature viewed from different angles. The former is used to describe the slope when ascending it, the latter when descending it. In a similar way, *horhorho khona* can refer in fact to any place on *horhorho* on the condition that the relation between the Figure and the Ground is such that it is not horizontal support that defines it. What type of configuration fits this definition depends both on the Figure and the Ground.

Many of the expressions described here are relative in an analogical sense. The Lokono model is sensitive to what the Figure is and where it is relative to the observer. The system itself (for the most part) does not distinguish between different scales of landforms, and on a higher level of generalization even neutralizes shape distinctions in the simplex term *horhorho*. It is the relation between the Figure and the observer with respect to *horhorho*, as encoded in the relational and configurational terms that provides the grid for partitioning *horhorho*. In other words, the way *horhorho* will be divided depends largely on what we want to locate and where we are. The non-lexicalized status characteristic of the domain goes hand in hand with this inherent perspectivism. Finally, it is also tempting to think of this system in terms of the physical features of the local landscape, which often prevents the observer from observing the changes of the relief. This may underlie the fluidity of the system; the shape of the land is often only visible *in situ*.